

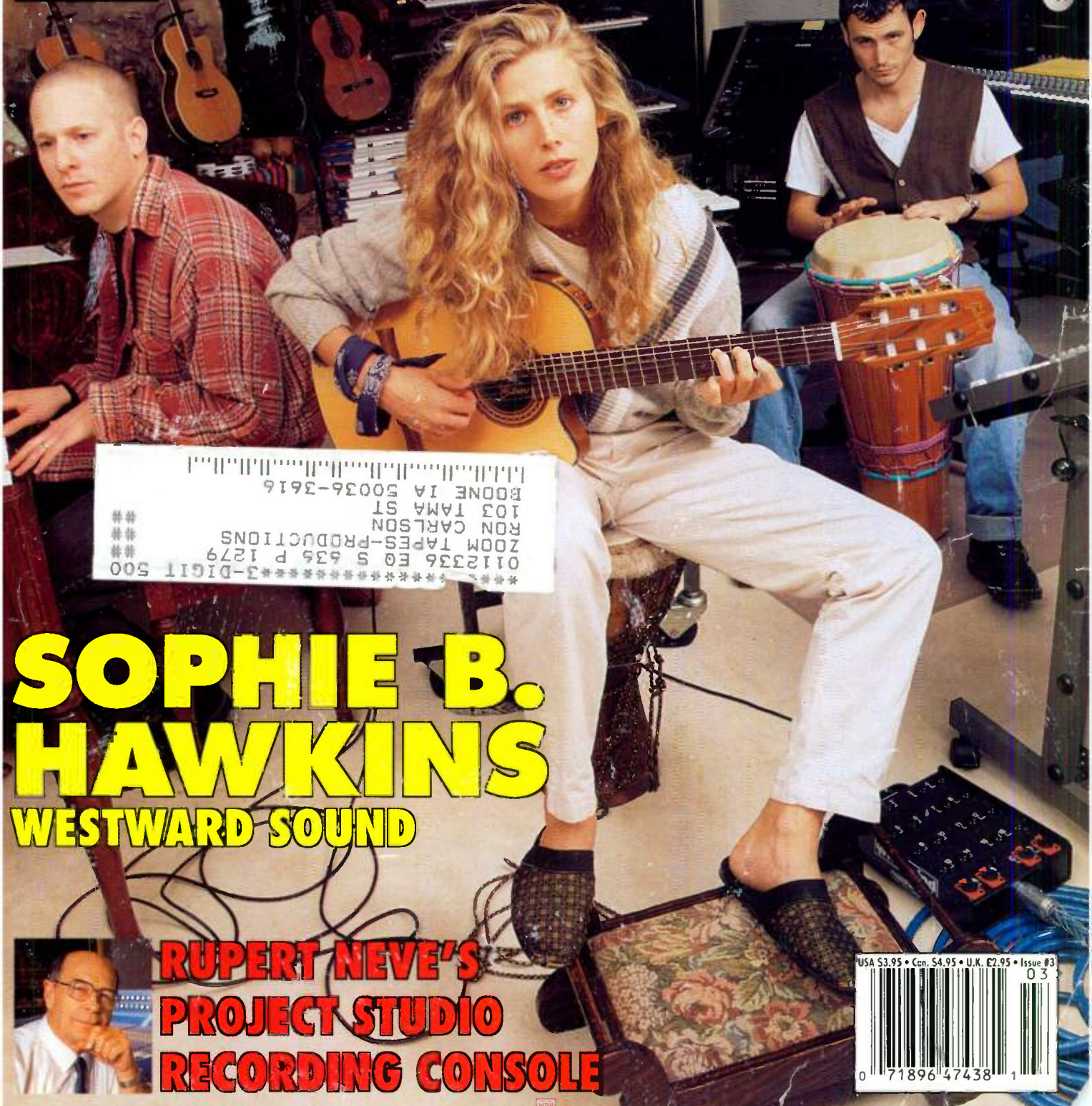
PROJECT RECORDING CONSOLE ISSUE

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THE PROJECT
RECORDING &
SOUND
MAGAZINE

EXCLUSIVES:
BRUCE SWEDIEN'S MIKING TIPS
LENNY KRAVITZ'S VINTAGE LIVE
ROLAND VS-880 FIRST LOOK
LEXICON PCM 90 ROAD TEST

MARCH 1996



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SOPHIE B. HAWKINS

WESTWARD SOUND



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CIRCLE 31 ON FREE INFO CARD



EQ

PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 7, ISSUE 3
MARCH 1996



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As her latest album continues to surge on the charts, Sophie B. Hawkins has packed up her New York City studio and moved it out to sunny Los Angeles. Find out how her project studio operates as well as the part it plays in Sophie's recordings.
- CONSOLE: 1996**.....66
As was evidenced by the number of project studio recording consoles at the Winter NAMM Show, 1996 is the year of the mixer. This special section is kicked off by Rupert Neve's ultimate project console, and features lots of hands-on reviews and First Looks, including boards from Behringer, Oram, Soundtracs, Amek, Soundcraft, Peavey, Spirit, and DDA. Plus: A review of Mackie's Ultramix automation system.

EQ LIVE

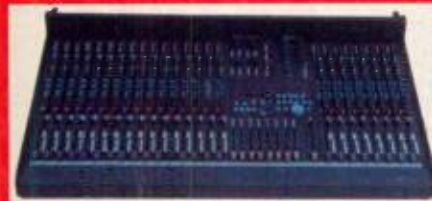
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ON THE COVER:
Dave Pelman, Sophie B. Hawkins, and Robb Valier at Four Sheets to the Wind. Photo by Edward Colver.

EQ (ISSN 1050-7868) is published monthly by Miller Freeman PSN Inc., 2 Park Ave., Ste. 1820, New York, NY 10016. Second class postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. 1 yr. \$24.95, 2 yrs. \$39.95, 3 yrs. \$59.95; CANADA add \$10.00 per year for surface; other countries add \$15.00 per yr. for surface; All add \$30.00 per yr. for Airmail. Back-issues \$5. Printed in the U.S.A.

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A Miller Freeman PSN Publication
Vol. 7, No. 3
March 1996

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EQ (ISSN 1050-7868) is published monthly by Miller Freeman PSN Inc., 2 Park Avenue, Suite 1820, New York, NY 10016. Second class postage paid at New York, NY and additional mailing offices. POST-

MASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. 1 yr. \$24.95, 2 yrs. \$39.95, 3 yrs. \$59.95. CANADA add \$10 per yr. for surface; other countries add \$15 per yr. for surface. All add \$30 per yr. for Airmail. Back issues \$5. All product information is subject to change; publisher assumes no responsibility for such changes. All listed model numbers are product names; are manufacturers' registered trademarks. Printed in the U.S.A. Miller Freeman A Division of Miller Freeman

Project Consoles In a Pro Audio World



What can you say about the Yamaha 02R digital console that hasn't already been said since its show-stealing debut at the fall Audio Engineering Society convention in New York? Reviewers have been playing "Can You Top This?" with their lavish praise about this remarkable console. One veteran audio manufacturing executive estimates that first year sales would likely set an all-time industry record, topping \$20 million.

The purpose of this commentary is not to heap more praise and adulation on the 02R. Rather, it is to address two problems that Yamaha and any digital project studio console manufacturer will surely face in the years ahead.

The first issue is one of manufacturing. One could reliably expect that the experiences gained by Yamaha with the DMP7, DMP7D, and ProMix 01 have provided excellent technical and manufacturing stepping stones to the 02R. From the user standpoint, the most important fact was that these units worked — and worked right out of the box. My only suggestion to Yamaha here is that they improve rather than relax quality control as deliveries increase.

The bigger issue for Yamaha, and for any project studio console manufacturer for that matter, is one of service. Welcome to the Pro Audio World, one that is more demanding, less forgiving, and more used to local response to problems. This means the availability of trained technicians who can respond in person to get the problem solved. This is no signal processor, mind you. This is the main act. Without the console that you've built your whole project studio around, you're out of business!

It is easy for manufacturers to expect the dealer to handle this problem for them. And, sure, our pro audio studio techs and maintenance guys and gals will come up to speed quickly; but in the beginning of this technological revolution there's no way that a dealer can be ready without some heavy training.

As the first manufacturer to break the digital project studio price barrier, Yamaha will set a project-studio service standard for many years and manufacturers to come. As a result, I recommend that they flood the major markets of New York, Hollywood, Nashville, Atlanta, and Chicago with some knowledgeable factory technicians for a few months after deliveries start flowing. Yes, it's expensive, but if they are going to bat in the pro [commercial] audio league, they better know how to play the game. And the cost is nothing compared to lost revenue if the industry perceives there to be some unfounded reliability problem that starts buzzing internationally overnight on Web sites like Soundwave on the Internet. In the process, these factory techs will have had a few months to train a good-sized cadre of dealers and technicians before heading back home to plan their ultimate Neve/SSL killer.

Here's some advice from someone who has spent the better part of his career selling consoles in the pro audio trenches: Even if your product is absolutely glitch-free, be prepared to head off any little problems at the pass before they become big ones.

The Yamaha 02R and the project studio have changed a lot of our industry's rules, but this is one that I expect will be around for a long time to come.

— Hamilton Brosious

Hamilton (Ham) Brosious is managing partner of HBA in Connecticut. Ham grew up in the depression in the '30s; went off to war as an infantry lieutenant in the '40s; spent the '50s in the newspaper business; learned about integrity in manufacturing from Larry Scully in the '60s; founded and managed AudioTechniques in the '70s and '80s; and still loves the business in the '90s.

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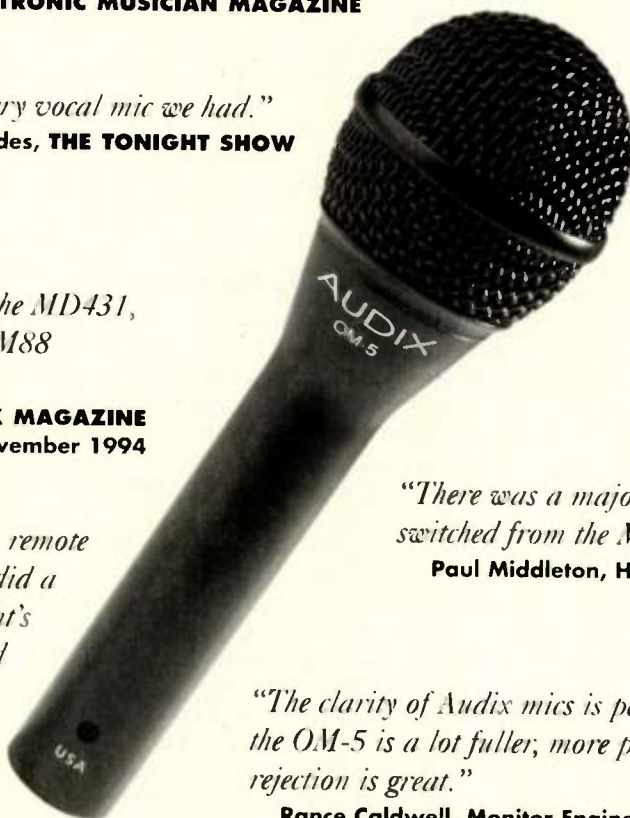
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Mark Frink, MIX MAGAZINE
November 1994

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RADIO WORLD
February 1995



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CIRCLE 16 ON FREE INFO CARD

FLASHBACK

I read with great interest the article about Jimi Hendrix's studio persona. I was lead guitarist with LOVE from 1969-71, and during a tour of Europe in early 1970, we recorded with Jimi at Olympic Studios. One song ended up on the last album I did with the group, and I consider him to be the single greatest electric guitarist that ever lived. As Chas mentioned, it was all in his hands — instantly the guitar sounded like a comet!

One slight correction: The engineer who started the Record Plant in Los Angeles was Gary Kellgren. He was a brilliant innovator and a very nice guy, and if I ever had a question about anything he was right there with an answer. His methods of recording guitar were revolutionary for the times. I still use some of them in my studio.

These types of feature articles are good in several ways. It gives historical perspective to young artists who need to know that there weren't always megaprocessors and gigabytes, and it reminds us all that our roots are in the great American innovative spirit, which has never been stronger than it is today. Your publication is a great tool and inspiration to those of us who must play and record music to be alive. Thanks for listening!

Gary Rowles
Wake Robin Recording
Corvallis, OR

SEPARATED AT BIRTH

We were wondering...when did the soul of Eddie Van Halen occupy the body of Stephen J. Cannell, '80s TV super-producer?

Johnny
via America Online

[Actually, we felt that Eddie's look had been more influenced by Cmdr. William Riker on Star Trek: The Next Generation. —Ed.]

FUTURE VISIONS

The February 1995 edition of EQ Magazine has a letter sent by Kevin Paez, which is titled "On The Right 4-Track." In the letter, Kevin expresses his wish to see cassette deck manufacturers introduce 4-track machines that could be coupled with mixers such as the Mackie MS-1202.

I believe Kevin has missed the mark here. The basic idea of inexpensive 4-track recording devices is commendable, but those devices should be versions of the Sony MiniDisc machine, not cassette decks.

A 4-track MiniDisc recorder optically coupled to a digital sound card installed in your computer, plus your favorite sound editing program, will make a formidable creative tool kit indeed.

Corby Grubb
Alpha Audio Associates, Inc.
Cleveland, OH

HOLD THE MIXER, PLEASE

Regarding the Letter to EQ [Feb. '96] by Kevin Paez of Dallas, TX, I assume by your letter that you are looking for a 4-track cassette recorder minus the mixer section, right? I'll proceed on this assumption.

First of all, this is not so much "revolutionary" as it is "retro." TASCAM (or TEAC, TASCAM's parent company) used to build a rack-mountable 4-track cassette recorder. I can't remember the model number [model 234], but it had transport controls, record-enable buttons, line inputs, line outputs, and four VU meters. It was up to the user to provide a mixer, (ostensibly, one of the Spirit Folios or Mackie 1202's that you mentioned), amplifier, speakers, and so on.

I don't work for TASCAM so I can't be sure, but I believe that these are no longer in production. [The 234 is no longer in production, but check out the 134B Syncaset, a 4-track/4-channel, 2-speed recorder. —HGL] The last time I checked, however, you could still get the TASCAM 238, an 8-track cassette version with basically the same features listed above. The problem is that when I last looked, its machines listed for about \$1500. When you take into account the fact that you can get a used ADAT for only slightly more money, and at the same time get all the benefits of digital sound quality and modular expandability...well, you do the math.

If an ADAT is not cost-effective for you, or if 4 tracks are all you need, I have a couple of suggestions:

1. Keep your eyes open for a used model of the aforementioned TASCAM 4-track. TASCAM products are, overall,

moderately rugged and you should be able to get at least a few good years out of a used machine.

2. There is no rule that says you are required to use the mixer section of a personal 4-track/mixer combo. Every 4-track I have ever seen has dedicated tape outputs that you can patch into the line inputs of your personal mixer. This will give you the advantage of better EQ, increased auxiliary sends/returns, and monitor sends. Headroom will be increased as well, since it is usually in the mix bus where you run out of "room." You can even use the inputs of your mixer for recording to the 4-track, giving the advantages listed above as well as better mic preamps. (That is assuming the mic pres in your board are better than the ones in your 4-track, which they usually are.) Just patch your group/direct outputs from your board to the line inputs of your 4-track, set the faders to unity gain, and turn the mic pres down. It's just like going direct from your mixer to tape. This is probably the way to go since even integrated 4-track/mixer "Portastudios" are very reasonably priced.

I hope I was able to help.

Chris Brooke
Living Water Rock Ministry
Tukon, OK

THE PRICE IS WRONG

First, let me thank you for mention of our products in your December '95 edition of EQ, in the "Tech The Halls" section (Page 72).

I did, however, want to correct a couple of wrong price quotes in the write up. The Macman retails for \$59.95 and probably has a street price of around \$50 (not \$70 as mentioned

WRITE TO US

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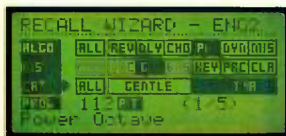
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CIRCLE 44 ON FREE INFO CARD

LETTERS TO EQ

in the article). Here, I assume you must have been working off an older price list. Secondly, the MIDIMAN Portman comes in 3 flavors: the Portman PC/P, Portman PC/S, and Portman 2x4. The Portman PC/P and PC/S are the most commonly purchased units and have historically on occasion been referred to as "Portman." The retail price on both Portman PC/P and PC/S is \$109.95 (not \$179.95 as mentioned in the article).

Thank you for your attention to this matter. And again, thank you for your support.

*Tim Ryan
MIDIMAN*

TIME WELL VENT

Having spent the last 16 years working as a maintenance tech in some of the finest studios in the business, I've done thousands of tape machine alignments, and it never fails to amaze me that there still appears to be so little standard concerning the documentation and recording of tones and timecode.

I just aligned a 24-track [analog] tape destined to be locked to a 48-track digital tape. Both tapes were generated at the same major New York City studio. The analog reel had the following tones: 1k, 10k, and 100 Hz, as outlined on the tape box label. Good enough; I knew what I was getting. What I didn't get was the second low-frequency tone so I could determine where the head bump was on the original recording machine. There's not even a checkbox for 50 Hz, so obviously the maintenance tech was following established criteria, as incomplete as it was. Aligning 100 Hz at 0 VU puts 50 Hz at what level? Could be anywhere from -3VU to -1VU typically [depending on the machine]. Big difference.

The other small complaint is: Where was it marked that I would know how long each tone was? And why wasn't it marked that there where no tones printed on track 24? Lastly, it's extremely helpful to put a very short blank space between each tone so I can see the meters drop as a visual cue. Yes, policy says you listen to the tones as you align, but still, a little visual cue is awfully helpful.

On the issue of timecode: the analog tape type said it had SMPTE on

track 24. That's nice. What type [of SMPTE]? Was it video referenced? The digital reel politely stated the code was 29.97. Again, drop frame, non-drop frame? Was it video referenced? Help me out here, people!

To be brief, I won't get into the issue of azimuth alignment. Referenced to two different MRL [Magnetic Reference Laboratory] tapes in my possession, the azimuth on these tones was out by 90 degrees! That's more error than a simple difference between any two MRL tapes.

For this same session, there was also another tape with tones generated at yet another big name New York City studio. Tones OK, azimuth agreed with my MRL tapes, but, again, no duration noted, no space between tones, and the leader tape arrows pointed in the wrong direction! Thanks. I had to listen to the music to be sure this tape wasn't incorrectly stored heads out.

Has SPARS generated a set standard for alignment procedures and timecode documentation? If so, please print those standards. In an industry that I see as failing its clients on a technical level, a reminder to the younger techs and assistants might prove helpful.

*Robert Knox
The Time Machine
Landgrove, VT*

STUD FINDER

I have just finished reading the January issue cover to cover as usual and it was great! Keep up the extensive coverage of live-sound issues.

I found Craig Anderton's article on studio construction techniques quite interesting, but I feel his misuse of some carpentry terminology may confuse your readers. When addressing wall construction details, Mr. Anderton refers to the wooden structural members as "joists." Joists are actually horizontal structural members used to support floors and/or ceilings. The correct term for a vertical member in a partition wall is "stud." I'm sure you will hear this from a number of readers, who, like me, toil away at day jobs in the construction industry.

*Dan Buckhiester
dB Productions
Pickens, SC*

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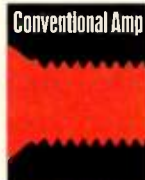
The 4.0 achieves remarkable audio quality because **voltage supply to the output section is powerful and stiff**. There are virtually no sags following transients or long peak power demands. You won't hear typical modulation from AC ripple or garbling during clipping. The bass is ultra-clean and fat. Highs are pure and unstressed.

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A **PowerWave transformer "flies" at 115 kHz** (2000 times the frequency of a conventional transformer). Waste heat from resistance is almost nil. The supply is 90% efficient! And the 4.0 features **the latest three-step Class H linear output circuitry** for maximum audio quality and efficiency.

"NO-FAIL" PERFORMANCE

QSC's renowned protection circuitry is enhanced by the PL 4.0's "smart" supply which matches power delivery to changing musical demand. The 4.0's thermal management keeps the amp cool under extreme conditions (even 2 ohm loads). And with the 4.0, **EMI and RFI are absent**, making the amp safe for wireless mics.



Less power sag, less clipping intermodulation, more bass impact, cleaner transients...PowerLight.



INCOMPARABLE AMP

You won't see or hear another amp with the power and performance of the PowerLight 4.0. **Call your QSC Dealer or QSC direct at 714-754-6175** for complete details.

The front panel of the PL 4.0 features comprehensive LED status arrays, detented gain controls with soft touch knobs and 2 dB steps for easy resetting.

Made in USA.

4 PowerLight Models

Model	0.5A	1.0A	1.5A
PowerLight 1.0	200 Watts	325 Watts	500 Watts
PowerLight 1.4	300 Watts	500 Watts	700 Watts
PowerLight 1.8	400 Watts	650 Watts	900 Watts
PowerLight 4.0	900 Watts	1400 Watts	2000 Watts

*20 Hz-20 kHz, 0.1% THD, ** 1 kHz, 1% THD

PowerLight 4.0 Key Features

- ▶ PowerWave™ Switching Technology
- ▶ Advanced Thermal Management System
- ▶ DC, Sub Audio and Thermal Overload Protection
- ▶ Data Port for Use With QSC MultiSignal Processors
- ▶ Neutrik Combo and "Tool-less" Binding Post Connectors
- ▶ Extreme Light Weight—30 lbs!
- ▶ 6 Year Warranty Available

Three-step, Class H linear output circuitry insures less waste heat, less current demand and excellent signal-to-noise ratio.

QSC™

AUDIO

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WHEN YOU'RE HOT...

Q What is a TRS connector? What does it mean for something to be wired 2 pin or 3 pin hot?

Brian Cinski
via America Online

A TRS is the abbreviation for Tip-Ring-Sleeve. This type of "three-circuit" connector is commonly used for headphones, balanced line inputs/outputs, insert points, and patch cords. In a balanced application, Tip is usually "hi" or "hot"; Ring is "lo" or "cold"; and Sleeve is ground. The designation of "hi" or "lo" relates the polarity of one signal to another as is the case in balanced operation. It is almost a meaningless concept unless more than one signal is involved.

Although the logic escapes me, the standard for XLR connector polarity is pin 2 "hi," pin 3 "lo." (The former standard had the polarity on these two pins reversed.) Pin 1 is always ground. Polarity (sometimes also called "phase") becomes an issue under the following conditions:

1. No gear should alter absolute phase unless specifically required by the user. This would be the case if, for example, a phase reverse switch were provided. Otherwise, part of any audio design criteria is that the output phase be of the same polarity as the input phase.

2. Interface would not be possible if two pieces of unbalanced equip-

ment, both outfitted with XLR connectors, conformed to opposite standards (one conforming to pin 3 hot while the other is pin 2 hot). Not only would no signal pass from the first device to the second device, but damage to the source device may result.

In a balanced configuration, the two signals are 180 degrees out-of-phase with each other. "Adding" them would make the two signals cancel, but subtraction (what happens when the signals are fed to a differential "balanced" input amplifier) amplifies the audio signals while simultaneously canceling induced noises such as hum and buzz. Electronic noise sources include wall-wart power supplies and computer and video displays.

Eddie Ciletti
Contributing Editor
EQ Magazine

MAC ATTACK

Q I am in the market for a new computer to do MIDI sequencing, console automation and, perhaps, digital audio. I am a Mac man at heart. I'm very familiar with MOTU (Mark of the Unicorn) Performer, and use a Mac Quadra 650 in the studio to run Performer. The problem is, what Mac do I get now? No one has Quadra 650's anymore. I've been very confused lately with all of the new Macs there are.

I was told to get a Power Mac 7100, but that same day I found out the 7100's weren't available. I looked at other Power Macs and Mac Performas, but computer salespeople with no clue about MIDI just made my frustration worse. I've been using PCs to do almost everything lately (even AOL), but I really want a Mac because I've got loads of stuff done on Performer (I forgot to save as MIDI

files). Which Mac will run Performer (or any other Mac-based sequencing software) with or without digital audio? (Please keep the recommendations in the \$2000 to \$2500 range. And, please, don't talk me into a PC.)

Phillip A. Carroll
Silkyphill/Smooth Sound Productions
via America Online

A Here are some tips on computer compatibility with Mark of the Unicorn's Performer: Performer 5.02 requires a Macintosh running System 7 (or later) and at least 5 MB of RAM. Fortunately, there are many good affordable Macs that meet these minimum requirements and have plenty of processing power to run Performer 5.02. A few good price/performance choices are the Quadra 6300, Power Mac 7200, or Power Mac 7500; all with a range of under \$2500.

Direct-to-disk digital audio has higher demands on your computer. Digital Performer 1.61 requires a Macintosh with a full-sized NuBus slot, System 7 (or later), and at least 12 MB of RAM. We recommend a 68040 processor or Power Mac. Some possible choices, perhaps a little higher than your \$2500 range, include the Power Mac 7100 or 8100.

Les Quindipan
Mark of the Unicorn
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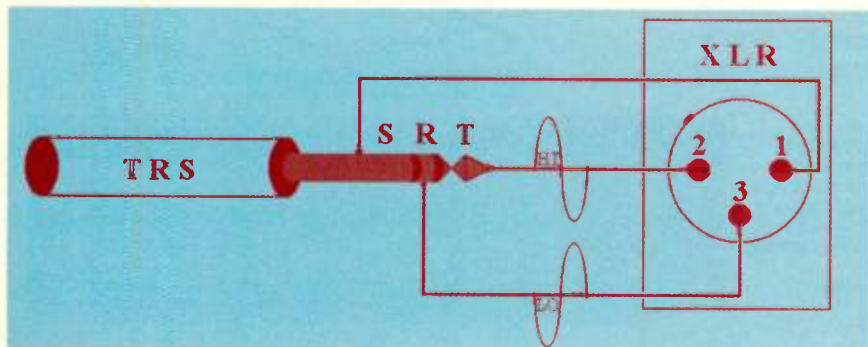
HE BE CHILLIN'

Q I have a small sound company in New York state and have been storing my sound gear in an unheated space for some time. Although I've had no problems so far, is this OK, or will I have problems with the equipment in the future?

Tom Clark
New York

A The bad part about storing your gear in an unheated space is not the cold, but rather the dampness: the worst thing that can happen to your equipment is if it's not used. So long as the knobs, faders, and switches get regularly exercised (turned, twisted, moved...) and the gear is enclosed (covered or encased) when it's not being used, your gear should continue to operate smoothly.

Eddie Ciletti
Contributing Editor
EQ Magazine



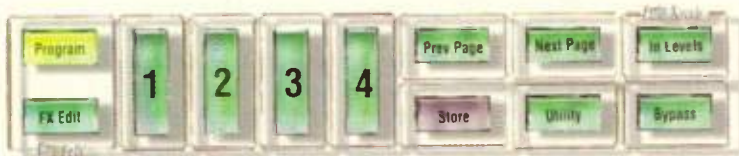
WHEN YOU'RE HOT: TRS & XLR connectors configured for "pin 2 hot" balanced operation as indicated by the pair of mirrored sine waves.

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What does multi-effects mean to you? Plugging in multiple signal processors to achieve the perfect blend of effects? That isn't Digitech's idea of multi-effects and it shouldn't be yours. How many times have you only imagined the ease of a single rack unit capable of true multi-effects? Check out the Studio Quad. With its ingenious user interface, large custom display, and potent S-DISC® technology at its heart, the Studio Quad is capable of not just replacing, but thoroughly eliminating the need for multiple, expensive, single-purpose processing units.

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SOFTWARE SEARCH

Q I own an Ensoniq KS-32 and am looking for a flexible sequencer/librarian. There are a lot on the market, but do particular products work well, that is, better, with the KS-32? I'd like to be able to mix patch changes in with the sequences so that I can — if possible — get over the 8-channel limit.

Tony O'Connell
via America Online

A Your question seems best dealt with in two parts:

1) What sequencer also works with a librarian that supports the KS-32; and
2) How can I maximize the 8-channel "multitimbrality" of the KS-32?

Working with a software librarian can really help to organize your sounds for any synth, and the KS-32 has a number of packages that support it. First, you should know that the KS-32 is compatible with Ensoniq's SQ-1/2/R series instruments, so anything that works with those products will also work with the KS-32.

Opcode's Galaxy software has librarian support for the KS-32, and works in tandem with their Vision and StudioVision sequencers, currently on the Mac, and coming soon for Windows. Already available for both Mac and Windows is Mark of the Unicorn's UniSyn librarian/editing software that works in tandem with their Performer and Digital Performer (Mac only), and FreeStyle sequencers (both platforms). Emagic has Sound Diver/Sound Surfer that works with Logic (both platforms), and there are other stand-alone librarians including Midi Quest from Sound Quest, Inc.

The second part of your question leads to the most effective use of the multitimbrality and the polyphony of your synth. With 32-note polyphony, and an average of 2 oscillators per sound, you're most likely dealing with an average of 16 notes at any one time. Divide that across eight parts, and it's not likely that the eight-part multitimbrality is really the issue, since you are likely running out of notes long before you've realized more than eight parts. (Yes, I know we're making assumptions about the music you're making, but see if this helps). The real issue is how to use more than eight different sounds across a whole piece of music.

This requires a bit of planning in

your arrangements. Map out your parts on a piece of paper, and see where a given part is not playing for any significant number of bars. These "holes" are places where you can insert a quick program change and bring in another sound for a while. Many people leave these holes unused, waiting for the resting instrument to come back in. No way. Fill them up with an additional percussion element or counter-melody line to add richness to your arrangement.

Still out of polyphony/multitimbral memory? Some common tips are to look at the sounds you are using and see if they have 2-3 oscillators, and if one or more of the oscillators can be turned off without severely changing the nature of the sound. Many sounds are originally programmed for maximum impact when played solo, and have detuned oscillators, or some subtle element that you may decide isn't critical in your piece of music. Try turning off that oscillator, save the sound (you did back up your RAM sounds into one of the librarians we listed above), and use the new "thinner is better" version in your mix. You may find that what sounds a bit thin by itself is actually perfectly appropriate when played in the context of your total arrangement.

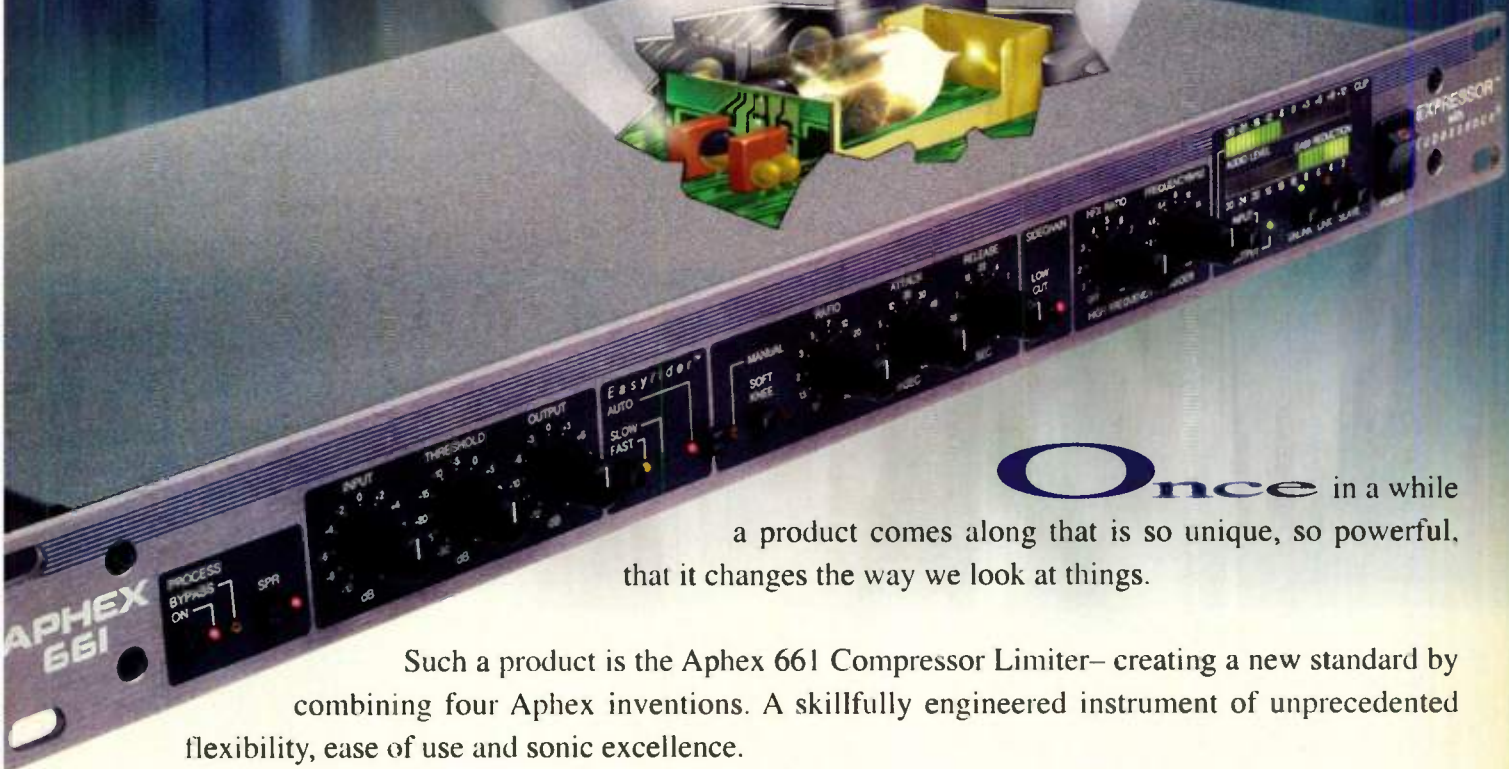
Another trick is if you're doubling a part (let's say a piano and a pad sound, or two solo woodwinds) and using two tracks to do it, try editing a sound to contain both of the parts within the three oscillators of your KS-32's voice, instead of the possible six that might have been used by two KS-32 sounds. Here an editor/librarian really helps, so the nod goes to MOTU and UniSyn/Performer or FreeStyle.

We hope these answers help, and open your creativity to some new ideas. If you need more help contact our Customer Service Department at 610-647-3930.

Jerry Kovarsky
Ensoniq

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time in the shop than in the studio. Plus you need a machine that synchronizes and locks up fast — typically 2 seconds or less. What's more, only the DA-88 can record an entire feature on a single tape. That's why the TASCAM DA-88 is the choice of production professionals. And that's how it became the undisputed industry standard.





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EQ PRODUCT VIEWS



TWIN EFFECTS

The DigiTech Studio Twin features S-Disc™ processing technology for enhanced stereo sound. The unit utilizes a 46.875 kHz sampling rate and 18-bit conversion to provide a myriad of tools that include stereo reverbs, multi-tap delays, chorus, flange, tremolo, detune and parametric EQ. There are 99 factory programs provided, while up to 99 combinations of user-defined programs can be modified and saved through the Studio Twin's interface. The unit also responds to MIDI, so programs can be changed on the fly. The suggested retail price of the Studio Twin is \$299.95. For more details, contact DigiTech, 8760 South Sandy Parkway, Sandy UT 84070. Tel: 801-566-8800. Circle EQ free lit. #101.

LIKE GOLD

Gold Line's 30M8RM Rack Mount Real Time Audio Analyzer features ANSI TYPE 2 filters, eight memories, and a built-in pink noise generator. Additional features include a flat instrument-type electret condenser microphone with phantom powering plus a line input with a range of -81 to +3 dBm. The 30M8RM's front panel is fitted with carry handles for portability and convenience. For more information, contact Gold Line, Box 500, West Redding CT 06896. Tel: 203-938-2588. Circle EQ free lit. #102.



MARY MACK(IE)

Mackie's new CR 1604-VLZ maintains the sound quality, construction, musical equalization and 5-way physical configuration of the original, but adds a slew of new features. The board features a true 4-bus design with channel

assigns to busses 1-2, 3-4 or L-R main mix, discrete mic preamps on all 16 channels, a new trim control gain structure for both mic and line inputs, 60 mm logarithmic-taper faders, and mid-range EQ sweepable from 100 Hz to 8 kHz. The CR 1604-VLZ also boasts aux send 1 and 2 master controls with individual solo switches and LED solo indicators. For more information, contact Mackie Designs, 16220 Wood-Road, Woodinville, WA 98072. Tel: 800-898-3211. Circle EQ free lit. #103.

GET BSSY

BSS Audio's FCS-916 microphone preamplifier/parametric equalizer features discrete circuitry with gain control and phantom power. The FCS-916 offers a separate line input, four parametric filters (each with independent in/out switching), and independent sweepable high- and low-pass filters. The EQ section boasts up to a 30 dB notch on each parametric band, bell/shelf selection on bottom and top bands, and 5-segment LED metering systems (pre/post EQ). The FCS-916 carries a suggested retail price of \$999. For more information, contact Harman Pro North America, 8220 Remmet Ave., Canoga Park, CA 91304. Tel: 818-830-8278. Circle EQ free lit. #104.

THE NATIVES ARE RESTLESS

Kurzweil's DMTi (Digital MultiTrack Interface) was designed specifically to interface with non-Kurzweil digital audio systems in their native formats. The 1U rack unit provides selectable sample rates, 16-bit resolution, and performs real-time data conversions between the Kurzweil K2500 Series "Production Stations," TASCAM DA-88, Alesis ADAT, and AES/EBU and S/PDIF optical formats. For more details, contact Kurzweil Music Systems, 13336 Alondra Blvd., Cerritos, CA 90703. Tel: 310-926-3200. Circle EQ free lit. #105.



DAT'S O' PLENTY

Featuring new 20-bit resolution DACs, together with the same type of 1-bit, 64 times oversampling A/D converter employed in their SV-3700 DAT, Panasonic has introduced the SV-3800 DAT recorder. The SV-3800 incorporates a 1-bit A/D converter and a high-resolution D/A converter. The unit also provides L/R independent recording level controls and a selectable sampling rate of 44.1 kHz and 48 kHz. Industry standard digital I/O facilities are provided as standard equipment. In addition to AES/EBU professional format XLR terminals, the SV-3800 also has IEC 958 consumer format coaxial and optical input and output connectors. Four combinations of digital output terminations formats (AES/IBU, IEC 958, coaxial, optical) are all user-selectable, enabling communication with many digital interfaces. For more information, contact Ramsa/Panasonic Pro Audio, 6550 Katella Ave., Cypress, CA 90630. Tel: 714-373-7277. Circle EQ free lit. #106.



HEAVY METAL

Sony's DARS-MP Series Metal Particle Tape features an advanced coating technology, where the metal particles in the magnetic layer are aligned diagonally, allowing the tape to record smaller wavelengths. This new process allows for maximum performance from Sony's PCM-800 and TASCAM's DA-88 modular digital multitrack recorders. The DARS-MP tape features a durable ABS plastic cassette shell and anti-static lid, along with a plastic storage case for added durability and protection from dirt and dust. It also employs the APRS/SPARS label system and will be available in 30-, 60- and 113-minute lengths. For more details, contact Sony Electronics, 680 Kinderkamack Rd., Oradell, NJ 07649. Tel: 201-599-3445. Circle EQ free lit. #107.

STUDIO RECORDER

The successor to Studer's D740 is the new D741 CD recorder. It includes analog I/O, AES/EBU and SPDIF digital interfacing and a standard SCSI-2 interface. A built-in sample-rate converter allows the digital inputs to accept signals at any sample rate between 32 and 48 kHz,



while on the analog side, individual L/R gain controls are provided for uncalibrated operation. There is also a calibrated mode for use with fixed studio levels. The D741 may be operated from the front panel or on a button-per-function basis, while monitoring can be carried out on headphones or on the built-in monitor speakers. To ensure maximum reliability, the D741 laser is calibrated for each disc recorded. In addition, the laser is dynamically controlled during the write process to compensate for fingerprints, dust or other obstacles on the surface of the disc. For more information, contact Studer, 1865 Air Lane Drive, Suite 12, Nashville, TN 37210. Tel: 615-391-3399. Circle EQ free lit. #109.

MAKE THE SWITCH

Millennia Media's new high resolution gain switch retrofit is designed for all HV-3 (2-channel) and Quad (4-channel) microphone preamplifiers. The high resolution gain switch has 36 positions and is intended for recording applications where noise floor and dynamic range must be optimized. Millennia Media utilizes Roderstein MK-1 resistors, a C&K "T" series gold-plated gain ranging toggle, and a Grayhill 12-pole, 3-gang gold-plated rotary switch. The high resolution gain switch is available on all new Millennia Media preamps, or as a factory retrofit to any Millennia mic preamp now in use. High resolution gain switches are priced at \$150 per channel, but as an incentive, through April 30, 1996, all existing customers may upgrade to high resolution switches at \$100 per channel. For further details, contact Millennia Media, Inc., 9624-C Kiefer Blvd., Sacramento, CA 95872. Tel: 916-363-1096. Circle EQ free lit. #108.

EQ

PRODUCT VIEWS



2000

T.c. electronic's M2000 is a 20-bit in, 20-bit out stereo unit with two analog inputs/outputs, and one digital in/out. The M2000 features the same DARC™ processor as the M5000 and has 24-bit internal processing. There are 250 factory- and user-defined settings (as well as room for 250 additional user-defined settings), and the unit's double-powered engine configuration allows it to run two effects simultaneously. Effects include TC C.O.R.E.™ reverb algorithms, as well as pitch, delay, chorus, ambiance, EQ, de-essing, phasing, compression, and stereo enhancement. For more details, contact t.c. electronics, 705 Lakefield Road, Westlake Village, CA 91361. Tel: 805-373-1828. Circle EQ free lit. #110.



GIVE IT A WHIRL

Whirlwind's Mic Eliminator is a new direct box with special frequency tailoring to produce the classic sound contour of a close-miked guitar speaker without requiring an actual mic or speaker. The Mic Eliminator's high-input impedance opens up the sound of high-gain pickups, and the Brite/Dark switch allows a choice between the frequency curves typical of on-axis and off-axis mic positioning. The Mic Eliminator provides a low impedance balanced output signal suitable for direct connection to a mixing console. The Amp/Inst switch allows it to be fed from a speaker output, a preamp output, or directly from the instrument, while the Gnd/Lift switch allows the output ground to be isolated. For more information, contact Whirlwind, 99 Ling Rd., Rochester, NY 14612. Tel: 716-663-8820. Circle EQ free lit. #111.



PLEASE TAKE THE STAND

The CKD 10 and CKD 11 speaker stands from QMI are built from top-quality steel and are designed for positioning nearfield monitors in recording studios. The CKD 10 has a vertical rise of 1 meter (39"), while the CKD 11 will support a monitor at 1.1 meters (43"). Both models are finished in a tough black powder-coat paint, can be fitted with spikes, and can also be sand- or shot-filled to enhance stability. The CKD 10 and CKD 11 retail at \$229 and \$249 per pair, respectively. For more details, contact QMI, 7 October Hill Road, Holliston, MA 01746. Tel: 508-429-6881. Circle EQ free lit. #112.



PLAY IT AGAIN, SAM

The SAM 8M recorder digitally records and plays back synchronous audio and control information. The unit doesn't use tapes or disk drives and therefore has no moving parts to wear out. The audio and control information is instead recorded directly into non-volatile, solid-state memory. The SAM 8M has several sampling rates up to 32 kHz, up to 16 different messages, and can be configured for message times in excess of 34 minutes. Messages can be played back in a user-defined order. Audio line input/outputs, microphone in/out, and a built-in 10-watt amplifier are all included in the standard configuration. For more information, contact Simon-Kaloi Engineering, Ltd., 707 Clear Haven Drive, Agoura Hills, CA 91301. Tel: 818-707-9980. Circle EQ free lit. #113.

TOYS STORY

The 8MX2 mic preamp/mixer from Audio Toys Inc. (ATI) combines eight of ATI's Hallmark High Voltage (± 48 V) mic preamps with an 8x2 mixer. Each of the 8 XLR-type inputs have a 41-position detented trim control, a 41-position detented adjustable threshold Limiter, and pan pot. The 8MX2 allows either some or all of the inputs to be assigned to the stereo mix bus, or the eight line level returns from the digital multi-track to be monitored and mixed to the stereo mix bus. For more details, contact ATI, 9017-C Mendenhall Ct, Columbia, MD 21045. Tel: 410-381-7879. Circle EQ free lit. #114.



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PRODUCT VIEWS

A PORTABLE WITH PUNCH

TASCAM's 424 MKII Portastudio, the company's newest integrated cassette multitrack recorder/mixer, builds on the original 424 by adding significant new upgrades. New features include balanced XLR mic inputs, 3-band EQ with mid sweep, an upgraded aux system and automated punch in/out. The auxiliary effects system of the new 424 MKII Portastudio is a significant enhancement to



that of its predecessor in that there are now two aux sends, one of which doubles as a tape cue during the tracking process. The 424 also provides a dedicated monitor out that enables you to patch directly to a monitor amp or powered speakers without having to repatch connections to the mixdown recorder. The unit also features submix in connectors in order to work with an external mixer while also providing a convenient means of expansion for the musician running virtual MIDI tracks. The TASCAM 424 MKII carries a suggested retail price of \$599. For further information, contact TASCAM, 7733 Telegraph Road, Montebello, CA 90642. Tel: 213-726-0303. Circle EQ free lit. #115.

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Mondo protection from RFI interference.

Trim control (chs. 1-6). Ultra-wide +10 to -40dB range handles everything from hot digital multi-track feeds to whispering lead singers and older, low-output keyboards.

Pan control with constant loudness and very high L/R attenuation so you can pan the channel hard left or hard right without bleed-through.



Studio grade mic preamps (chs. 1-6) with high headroom, low noise (-129.5dBm E.I.N.) and phantom power. These are the same discrete mic preamps used to track and mix several gold & platinum albums on our acclaimed 8•Bus console series.

Balanced line inputs. Channels 1-6 are mono; channels 7-10 are stereo.

Low Cut Filter (chs. 1-6) cuts mic handling thumps, pops, room rumble and wind noise. Also lets you safely use Low Shelving EQ on vocals.

Two aux sends per channel with 15dB extra gain above Unity.

High shelf EQ. ±15dB at 12kHz.

Peaking midrange with wide, musical bandwidth centered at 2.5KHz. ±15dB.

Low shelf EQ. ±15dB at 80Hz.

Four buses on a 2-bus board! Mute switch routes channel output to extra ALT 3-4 stereo bus. Use it for feeding multitrack recorder channels, creating a subgroup via Control Room/Phones matrix (more info at right), monitoring a signal before bringing it into the main mix or creating a "mix minus."

Solo. AFL (for studio use) or PFL (for live sound mixing) via global switching. Individual channel metering via Solo makes level setting easy.

60mm logarithmic-taper fader.

More mixer in less space. The MS1402-VLZ takes up just 1.3 sq. ft. of work space.

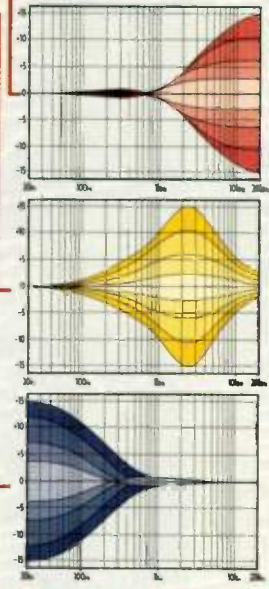


Balanced inputs & outputs (except RCA tape in/out & ch. inserts).

Beefy head-telephone amp can drive any headphones to shock volumes.

12-LED meter display with Level Set Indicator.

Separate 60mm L/R Main Mix faders.



Control Room/Phones matrix adds incredible tape monitoring, mixdown and live sound versatility to the MS1402-VLZ. It lets you route any combination of Main Mix, Alt 3-4 bus and Tape Input signals to the Control Room/Phones fader, outputs & LED meters. Tape and Alt 3-4 can also be assigned to the main mix.

Solo Mode switch globally selects mono pre-fader (PFL) or stereo in-place (AFL).



Built-in power supply. No outlet-eating, hum-inducing wall warts!

NEW

Balanced XLR outputs with switchable mic/line output level.

Control Room & Alt 3-4 Bus outputs. Mackie's signature 3-way Channel Inserts (chs. 1-6).

60mm log-taper faders are accurate along their whole length of travel for smooth fades. They employ a new long-wearing contact material for longer fader life & super resistance to dust, smoke, etc.





THE NEW MICROSERIES 1402-VLZ. YOU CAN'T GET A BETTER COMPACT MIXER.



VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for our acclaimed 8-Bus console series, VLZ effectively reduces thermal noise & minimizes crosstalk by raising current & decreasing resistance.



Takes a stomping and keeps on mixing. Our unique pressure-absorbing knob design, thick, horizontal fiberglass circuit boards and brass stand-offs resists downward impacts that would trash other mixer brands.

Solid steel chassis instead of aluminum or plastic.

RCA-type tape inputs & outputs.

Balanced 1/4" TRS main outputs.

Balanced stereo line inputs (chs. 7-14) are switchable from +4dBu pro level to -10dBV semi-pro levels. Can be used to boost any weak input signal.

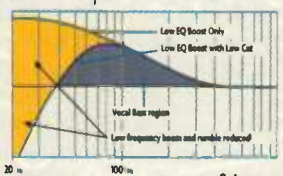
Fast, accurate level setting via Channel Solo.

As the Rude Solo Light blazes forth, a soloed channel's level is displayed on the LED meters. Set the channel fader to Unity, adjust input level to the Level Set marker and you've optimized the MS1402-VLZ UnityPlus gain structure for maximum headroom & minimum noise.

Aux Send 1 Master EFX to Monitor switch. lets you send aux return signals (delay or reverb) to the stage monitors through Aux Send 1.



Why do we make such a big deal about our Low Cut Filter? First, it's a real low cut filter with a sharp, 18dB per octave slope beginning at 75Hz (some so-called "low cut" filters' shallow 6 or 12dB/oct. slope lops off audible bass). Our filter cuts stage rumble, room noise, P-pops and microphone handling thumps — all of which muddy your



mix, robs amp power and can actually blow woofers. It has another equally valuable benefit: without the filter, if you try to add Low Shelving EQ to vocal channels, low-frequency garbage gets boosted to potentially disastrous levels. Engage the Low Cut filter and you can safely use Low EQ to enhance vocals.



Master Pre/Post switch. for Aux Send 1.

Two stereo aux returns with 20dB gain above Unity.

This one really drove our Engineering Department nuts. Greg wanted to pack a gazillion studio and live sound features into an extremely compact mixer. He wanted the same nice long 60mm faders we developed for the SR Series. He wanted balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room features. In short, he wanted it to be the best under-\$600 mixer value ever offered.

Many months and countless Diet Cokes[®] later, it's here.

The MicroSeries 1402-VLZ.

We invite you to shop around and compare it to other mixers costing up to \$1090. When it comes to low noise, high headroom, impeccable mic preamps, sweet-sounding EQ and sheer density of Cool Stuff, we think that you'll agree... Greg and his fanatical Engineering Department have done it again.

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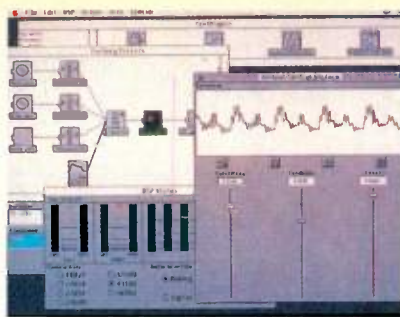
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EQ STUDIO WARE



INSTANT KYMA

With built-in spectral analysis tools to let you analyze your own samples and resynthesize them (with spectral morphing or warping) using additive synthesis, Symbolic Sound Corporation's version 4.1 of the Kyma sound design workstation software is one heck of an upgrade. New tools for specifying your own tuning tables let you take advantage of Kyma's 0.0026 Hz frequency resolution to build microtonal scales and other alternative tunings by remapping MIDI note numbers to any arbitrary frequencies. A MIDI scripting language lets you generate MIDI sequences algorithmically. For more details, contact Symbolic Sound, P.O. Box 2530, Champaign, IL 61825-2530. Tel: 217-355-6273. Circle EQ free lit. #116.



THE LIGHT...

Pinnacle Micro will soon begin to manufacture a new 5.25-inch 2.6 GB optical drive called Vertex for half the cost of its competitors. The Vertex cartridges are upward compatible to the Pinnacle Apex 4.6 GB optical drive. The Vertex offers a fast rotation speed of 3755 rpm, a 19 ms seek time, and a maximum data transfer rate of 6 MB per second. It can be used in PC/Windows, Macintosh, Sun, SGI, and Hewlett Packard environments. The Vertex will have a suggested retail price of \$1495 including one piece of media. For more information, contact Pinnacle Micro, 19 Technology Drive, Irvine, CA 92718. Tel: 714-789-3000. Circle EQ free lit. #118.

GET CONVERTED

With the ability to convert up to 24 channels of audio at one time and simultaneously output up to 5 different formats, Otari's UFC-24 Universal Digital Audio Format Converter comes standard with the capability to convert 24 channels of ADAT/RADAR, TDIF-1, PD, or SPDIF-2, with AES/EBU as an option. Digital audio can be transferred from any one source format to various machines, such as DTR-900's, 3324/48's, and multiple ADATs and DA-88's. A single UFC-24 can output 96 channels of digital audio across 4 different formats. With the AES/EBU option, the UFC-24 will output 120 channels of digital audio across 5 different formats. For more details, contact Otari Corporation, 378 Vintage Park Drive, Foster City, CA 94404. Tel: 415-341-5900. Circle EQ free lit. #117.



POCKET TRANSLATOR

The Pocket Express from Mark of the Unicorn is the world's first dual-platform MIDI interface for both Windows and Mac OS computers. The unit features two MIDI-ins and four MIDI-outs with activity LEDs. For Windows, the Pocket Express uses the parallel port, allowing operation with either desktop or laptop computers. For Mac OS, two serial ports are provided for dual 32-channel operation. A bypass button allows users to play their MIDI equipment even when the computer is turned off, and without having to manually reconnect cables. The Pocket Express includes full SMPTE tape synchronization capabilities. For more details, contact Mark of the Unicorn, Inc., 1280 Massachusetts Avenue, Cambridge, MA 02138. Tel: 617-576-2760. Circle EQ free lit. #119.

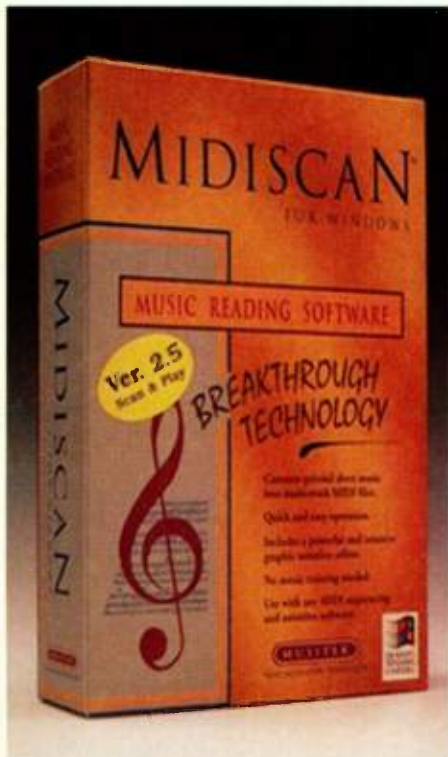


THIS AIN'T NO OVEN-STUFFER!

Priced at \$695, Windows-based Red Rooster software is the first product that allows studio musicians and technicians to edit PQ subcode from audio files on their PCs. (Microboards will also bundle Red Rooster software with its PlayWrite 2000 and 4000, 2X and 4X CD-recordable hardware and software packages.) Musicians can record from their master tapes using the soundcard in their computers or import a prerecorded digital audio file in a .WAV format. Red Rooster will automatically set correct index number, track number, track start time, length pause between tracks offset, emphasis, and copy protection then write the music to a CD-recordable drives such as a PlayWrite. Computer requirements are 386, 33 MHz or higher, 8 MB RAM, soundcard, Windows 3.1 or higher, and a CD-R drive. For more information, contact Microboards, Inc. of America, 1480 Park Road, P.O. Box 846, Chanhassen, MN 55317. Tel: 800-646-8881. Circle EQ free lit. #120.

SOFTWARE OF NOTE FROM MUSITEK

MIDISCAN Version 2.5 from Musitek outputs scanned music files into the new music notation interchange file format called NIFF. A .NIF file retains the score's graphical information such as a note's graphical attributes, page position, and lyrics, as well as MIDI note data. NIFF files can be readily exchanged between all notation programs that support the standard. Most music software companies have announced their intention to support the NIFF standard in subsequent upgrades. MIDISCAN will continue to output Standard MIDI as well as NIFF files. MIDISCAN for Windows automatically converts printed sheet music into Standard MIDI and NIFF files supporting up to 16 MIDI tracks. MIDISCAN processes scores in either part or ensemble format. Up to 24 scanned pages can be batch-processed at a time. Note and rest durations, note pitches, chords, ties, accidentals, bar



lines, clefs, key and time signature are all recognized with 90-98 percent accuracy. MIDISCAN is compatible with all MIDI software programs, TWAIN-compliant scanners, and FAX/FAX modems. For more details, contact Musitek, 410 Bryant Cir., Suite K, Ojai, CA 93023. Tel: 805-646-8051. Circle EQ free lit. #121.

ADVERTISEMENT

New Digital Multitrack

Designed And Priced With The Musician In Mind

By Aaron Palmer

I didn't know what to expect at this winter's NAMM show. But after a stop at the TASCAM booth, I am happy to report that my wish list and expectations for a digital multitrack were met and exceeded. And considering the crowd swarming around the new DA-38, I wasn't the only musician impressed.

TASCAM used this year's mega-music industry event to unveil what it has dubbed "the musician's digital multitrack." I had a chance to really check out this machine and talk to the people at TASCAM. Just looking at the machine you get the impression this is unlike the other brand's modular digital multitrack. Its clean and simple design and solid unitized construction are just the start. An attractive price, compatibility, and a super fast transport make it even sweeter.



TASCAM has done it again. Late this spring it will unveil its new digital multitrack designed for musicians — the DA-38. Available this summer at TASCAM dealers.

According to TASCAM, the DA-38 was designed for the musician and songwriter. And given the number of musician-oriented features, I think they've succeeded. For starters, it has complete MIDI capabilities. This makes it perfect for integrating with your sequencers. Next, they've

added a slick new digital track copy feature with an electronic patch bay. This lets you do assemble editing. Think of the possibilities. But what impressed me most were the simplified menus. After just a few minutes, I could find, understand and navigate through these and the DA-38's other musician-oriented features with ease!

Another exciting plus for musicians and songwriters is the DA-38's 100% compatibility with any Hi8 digital multitrack (MDM) machine. TASCAM says this was their focus in the design process: to be sure that tapes recorded with the DA-38 would play flawlessly on DA-88s and other Hi8 based MDMs.

The DA-38 also lives up to the TASCAM name — the company that invented cost-effective multitrack recording. And if you're like me, (I've owned tons of TASCAM gear over the years) I've come to expect the highest quality, durability and trouble-free performance from everything TASCAM makes. Take my word for it — the DA-38 is built like a tank. I popped tapes in and out of it, played with the controls, took the shuttle wheel for a tough test drive — I've never felt anything smoother or more solid.

In fact, other musicians I talked to at NAMM were impressed with the speed of the transport. This is clearly faster than the S-VHS-based MDMs on the market. Now I know why post-production studios worldwide have chosen TASCAM's Hi8 transport over the others.

To me, the most important thing in a multitrack recorder is sound quality. And the DA-38 didn't let me down here, either. This thing will knock your socks off — wow! Wait till you hear it. The DA-38 is perhaps the best-sounding MDM in its price range that I've ever heard.

But keep in mind the DA-38 is no replacement for TASCAM's award-winning DA-88. To make it more affordable for the musician, TASCAM trimmed out a few things that are critical for post-production, but aren't demanded by most musicians. Things like a plug in SMPTE synchronizer and the ability to be controlled by a video editor with Sony 9-pin. But for an affordable, high-quality and easy to operate machine, you can't beat TASCAM's new DA-38.

According to TASCAM, the new DA-38 will be in your dealer's showroom this summer. So if you're thinking of going digital — think this summer. Think TASCAM!

Aaron Palmer is a songwriter, guitar player and home recording enthusiast based in Huntington Beach, California. His goal is to be the first person in Southern California to own a DA-38.

There's progress.

And

then

there's

your

quantum

leap.



O2R

Recording industry leaders have auditioned Yamaha's new digital 8-bus O2R console and the verdict is in. It's a revolution in mixing. Ready to interface directly with today's digital multi-track tape and disk-based recorders. This breakthrough application of Yamaha's years of digital experience packs unprecedented creative power into a very affordable package. In fact, when it comes to high-end features and pure sonic quality, there's virtually nothing you can do on a six-figure board that's beyond your reach with the new O2R for under \$10,000.



50 dynamic processors let you compress, limit or gate all inputs, as well as the 8 program and stereo line outputs.

The real power of memory.

The difference between O2R and a conventional console is like the difference between a computer and a typewriter. O2R's sophisticated automation system remembers everything you do - all your moves and settings. So when your client wants a different version of that mix you did days, months or years ago, O2R can get you back to that exact mix faster than you can load his tapes. And that includes memory of all O2R functions: motorized faders, 4-band parametric eq, 50 limiter-compressor-gates, built-in effects processors. And more. O2R real-time automation plus snapshot memory result in tremendous time savings and better mixes. More income for your studio.

Digital I/O.

O2R can inspire greater sonic performance from your digital multi-track. A variety of interface cards lets you digitally connect to O2R, eliminating unnecessary A/D/A conversions. As you mix your project through O2R's all-digital 32-bit signal path you'll hear transparency, focus, and punch like never before. So get ready to transform the way you work.

Forever **Call 1-800-937-7171 ext. 580 for an informative O2R brochure and location of the YAMAHA dealer nearest you.**

YAMAHA
Smart Mixing

1-800-937-7171

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A New Spin on Things

STUDIO NAME: Airborne Music Productions

LOCATION: New York, NY

KEY PEOPLE: David Spinozza

PROJECTS RECORDED: A studio musician for 25 years, Spinozza has worked on recordings with artists such as Paul McCartney, James Brown, Billy Joel, Paul Simon, Aretha Franklin, John Lennon, Michael Franks, Dr. John, David Sanborn, James Taylor, Ringo Starr, Carly Simon, and Donny Hathaway, to name a few. He has also performed on, composed, or arranged thousands of TV commercials

CONSOLE: TASCAM M-2600 MK II

RECORDERS: TASCAM DA-88 [2]; TASCAM RC-848 remote control unit; Panasonic SV-3700 DAT machine

MICROPHONES: AKG C414; Shure SM58 [2]; ISOMAX 2-0 omnidirectional; Audio-Technica 48 V [2]

MONITORS: Westlake Audio BBSM-6

AMPLIFIERS: Perreux PMF2150B; Hafler P1500 trans-nova

SYNTHS & SEQUENCERS: Kurzweil Midiboard; E-mu Proteus 1 and Proteus 2; Roland MKS-20, R-8M, and Super JV-1080; Yamaha TX 816; Akai S9000; E-mu Performance 1+

COMPUTERS AND SOFTWARE: Macintosh II (souped up); Mark of the Unicorn Digital Performer; Digidesign Sound Designer 2 and Sample Cell; Passport Encore; Opcode Editor/Librarian

OUTBOARD GEAR: Quantec Reverb and Room Simulator; Roland SDE-1000 and SRV-2000; Lexicon LXP1 and LXP5; Pultec EQP-1A3; Symetrix compressor/limiter; Valley People Maxi-Q and Gain Brain 2

PATCHBAY: TASCAM PB-32 [8]

EQUIPMENT NOTES: Spinozza continues: I have found that running MOTU's Digital Performer and syncing with my DA-88's using the RC-848 Remote gives me all the flexibility I need. I do most of my synth tracks virtual and record all my analog material on the DA-88's. At mix-

down, I have everything coming back through my TASCAM board. With the TASCAM's six aux setup, I am free to do whatever processing I need. All that's left to do is to get a good stereo mix over to my DAT machine.

STUDIO NOTES: Spinozza notes: It is important to remember that while all this high-tech equipment is fascinating and a great assistance to the recording process, one's creativity, imagination, and playing ability is what gets recorded. The new project studio equipment has tightened the gap between what was previously considered professional and semi-pro. There seems to be no limit to working in all these different environments and having a terrific sonic outcome. Coming from a player's perspective rather than having an engineer's point of view, it took some time to get familiar with some of my gear. Having the luxury to experiment is a must and will result in a better production. **EQ**



**A NEW TASCAM M-2600 CONSOLE
GIVES MUSICIAN DAVID SPINOZZA
THE CREATIVE FREEDOM HE NEEDS**

Making cool sounds. That's pretty much the purpose of all multi-effects processors, and a task that the Sony HR-MP5 executes extremely well. It all starts with our dual-effects block architecture. Each block boasts both an effect and an equalizer. These can be used at the same time to create the exact sound you want, with your



quality that's better than expected for the price...smooth reverbs, digital clarity but with a warmth that sounds distinctly undigital.**

Yes, the Sony HR-MP5. It's versatile, convenient, affordable, and great sounding. In conclusion, allow us to leave you with some quotes from Keyboard Magazine, who wrote, "...clean

GET GREAT RECORDING EFFECTS WITHOUT BANGING YOUR HEAD AGAINST THE WALL.



OF COURSE, WE COULD MAKE THAT SOUND PRETTY COOL AS WELL.

choice of a serial, parallel, or dual mono configuration. Throw in the fact that each preset can be programmed with a different configuration, and it all spells one magical word: versatility.

With the HR-MP5, you get an abundant variety of effects, 51 in all. These include Delay, Chorus, Flange,

Pitch Shift, Reverb, and Dynamic Filtering. Add to the menu 100 pre-programmed and 100 user-definable presets, and it's easy to see that the HR-MP5 has a fully stocked effects buffet.

But don't just take our word for it, listen to what the experts are saying. Such as EQ Magazine, "Sound

and smooth presets...the display is big, bright and packed with information...friendly, easy-to-understand icons at every turn...this user interface is one of the best we've seen,...A+ for Sony.**

What more can we say? For more information, call 1-800-635-SONY, ext. MP5.

SONY

THE COMPRESSOR LIMITER EXPANDER/GATE

The name that defines great compression!

A/B the sound with and without sidechain processing. No patching required.

OverEasy®-- the choice of top professionals for soft-knee compression.

12-segment gain reduction meter allows precision monitoring of compression.

Tells you when the zero-attack PeakStopPlus™ limiter is doing its thing.

Link both channels the best way with True RMS Power Summing—a very musical way to achieve stereo compression.



Flexible expander/gate works over a 70 dB range.

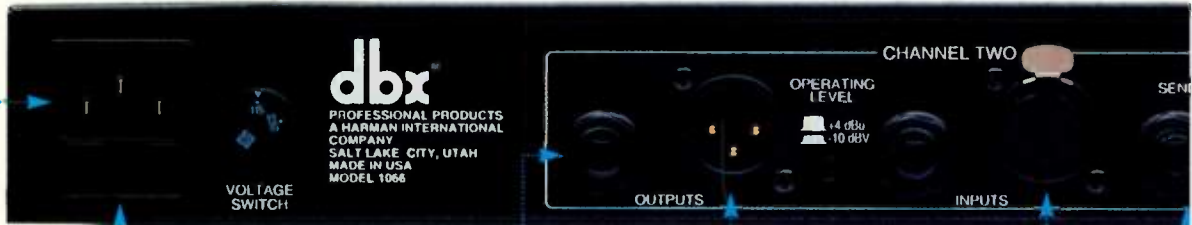
Monitor sidechain processing when setting up the unit.

Prevents low-frequency energy from punching holes in the sound.

Get that classic dbx sound by selecting program dependent attack and release times. or (see #18)

Monitor either input or output signals.

The illuminated switches are not only cool, but are easily seen in light or dark.



Internal power supply with easily replaceable power cord.

Easily accessible fuse — you'll probably never need to find out how easy.

Connect the unit hassle free using either unbalanced or balanced 1/4" TRS or balanced XLR connectors.

Ensure signal path integrity with gold plated locking Neutrik® XLR connectors.

Add processing to detector path for frequency-conscious compression/gating/special effects.



THAT WILL TURN THE WORLD ON ITS EAR.

AGAIN.

You've seen and heard dbx signal processors for as long as you've been involved with audio. After all, our boxes are in daily use all over the world, with major touring companies, world class recording facilities, radio and television broadcast facilities and anywhere else audio professionals ply their trade.

Now, after over twenty years of pleasing the most finely tuned ears in the business, dbx has done it again with the new 1066. The dbx 1066 will, of course, be the standard against which all compressor/limiter/gates are judged. State of the technology VCA's, meticulous component selection, and scrupulous testing procedures are just a few reasons the new dbx 1066 is the latest in a long line of pedigreed signal processors.

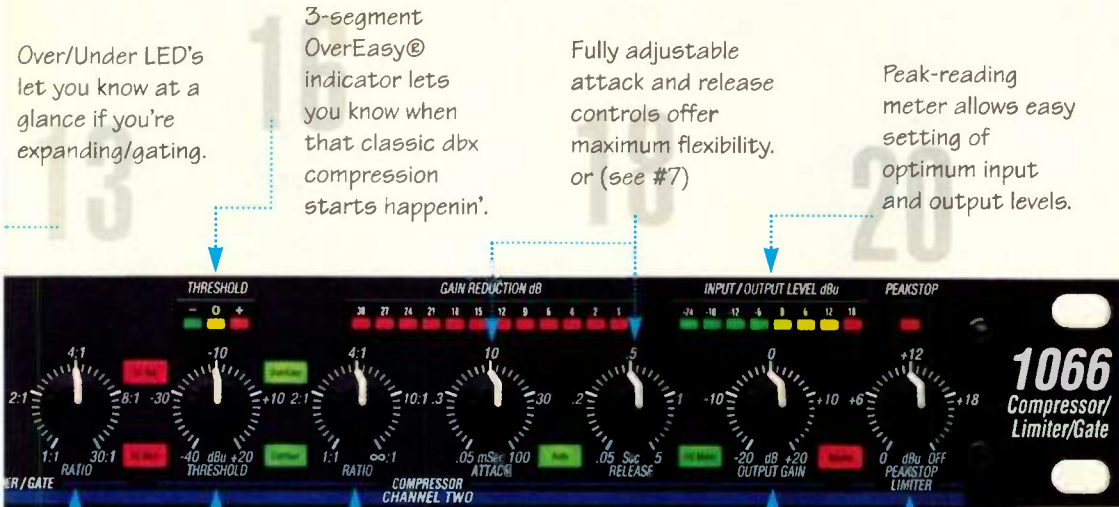
So head on down to your local dbx dealer and audition this box. We're sure you'll see why the dbx 1066 is destined to turn the world on its ear.

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Over/Under LED's let you know at a glance if you're expanding/gating.

3-segment OverEasy® indicator lets you know when that classic dbx compression starts happenin'.

Fully adjustable attack and release controls offer maximum flexibility. or (see #7)

Peak-reading meter allows easy setting of optimum input and output levels.

Vary the Ratio to select anywhere from gentle downward expansion to gating.

Detented controls and soft-touch knobs assure precision adjustments.

Adjusts from mild compression to infinity:1 limiting.

Add make-up gain or match levels over a 40 dB range.

Newly developed PeakStopPlus™ circuit intelligently tames signal peaks.

Add optional custom dbx output transformers manufactured by Jensen®.



Servo-balanced outputs drive up to +22dBu

Convert semi-pro -10dBV signals to the dbx 1066's professional +4dBu internal level.

Precision balanced inputs reject hum and noise in tough audio environments.

Separate sidechain send and return jacks —no special "insert Y-cables" required.

Heavy-duty steel chassis will take years of road use and abuse.

RØDE NT2

Meet this new and
"true" mic all the way
from Australia

MICROPHONE NAME: RØDE NT2

PRICE: \$749 (including SM-1 shock mount, flight case, and pop filter)

TYPE OF MIC: Condenser

POLAR PATTERN: Omnidirectional or cardioid

FREQUENCY RESPONSE: 20 Hz to 20 kHz

SENSITIVITY: 16 mV/pa

OUTPUT IMPEDANCE: 200 ohms

SELF-NOISE: 17 dB (A-weighted)

MAXIMUM INPUT SPL: 135 dB (145 dB with pad switched on)

POWER REQUIREMENTS: 48 volts DC

CURRENT CONSUMPTION: 3.5 milliamps

WEIGHT: 530 grams

MIC NOTES: Hand-made in the "Land Down Under" — Australia — the Rode NT2 microphone utilizes a "true condenser" design (its microphone element is constantly biased by the preamplifier). The capsule contains two gold-plated, large diaphragm transducers to achieve omnidirectional or cardioid polar patterns. Output of the NT2 microphone is transformerless, and the low-frequency roll-off switch helps avoid transmission of mic stand-related noises.

USER TIPS: In addition to its strength as a lead vocal microphone, the NT2 also makes a great choice for miking acoustic guitar. For a transparent guitar sound, try a pair of NT2's — one at the bridge and one on the neck at around the sixth fret. Place the mics directly on-axis to the guitar and approximately six inches away from the instrument. Record each mic to a separate track, and when it comes time to mix down, pan the tracks hard left and hard right.

CONTACT: The NT2 is distributed by Event Electronics, P.O. Box 4189, Santa Barbara, CA 93140. Tel: 805-962-6926.



Photo by Edward Colver

SPIRIT 8

THE EXTRAS COME AS STANDARD
THE PRICE COMES AS A SURPRISE

Spirit 8 is a quiet, compact and rugged 8-bus mixing console, hardly surprising from a company with over 22 years of knowhow in audio design.

What may be surprising is that it comes with every feature you could wish for, as standard, at a price that will make the competition wonder how we did it.*

METER BRIDGE BUILT IN

UP TO 40 BULLET-PROOF MIC INPUTS

4 MUTE GROUPS

INDIVIDUAL CHANNEL BOARDS

10 X 2 MATRIX SECTION



MONO INPUT

DUAL STEREO INPUT

GROUP SECTION

■ 8 STEREO RETURNS for additional stereo sound sources or effects units: 4 have EQ

■ 10 X 2 MATRIX section for additional mixes

\$4,299 **16**

\$5,299 **24**

\$6,399 **32**

\$8,299 **40**

* Prices are 1995 US suggested retails

Also available:
Spirit Live 3: 3-bus
Spirit Live 4: 4-bus

■ 4 FRAME SIZES: 16, 24, 32 and 40 channels

■ UP TO 64 INPUTS AVAILABLE (40 channel version)

■ 4 STEREO INPUTS with 2-band EQ and full access to Aux

■ METER BRIDGE AS STANDARD, showing mono input, group and master levels

■ INDIVIDUAL CHANNEL PCBs for ease of maintenance and replacement

■ Every pot INDIVIDUALLY FASTENED to the steel fascia, the professional way, to cope with knocks

■ RUGGED "NO-TWIST" STEEL CHASSIS built to survive hectic tour schedules

■ Side-checks can be removed for FLIGHT CASE INSTALLATION if desired

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CIRCLE 72 ON FREE INFO CARD

Roland VS-880 Hard-Disk System

Get powerful digital editing at an affordable price

BY CRAIG ANDERTON

Just about all the pundits think that hard-disk recording will be "the next big thing" after digital tape. So far, the most popular systems have been based around personal computers, but a new generation of stand-alone hard-disk recorders have tried to break through to a larger market by putting all needed hardware and software inside an easy-to-use, self-contained package.

With the popularity of the DM-800, Roland is hot on hard-disk recording, as evidenced by its latest release — the VS-880, a hard disk-based recording studio with recorder, digital mixer, and optional effects board. Once you get your audio into the VS-880 through the 18-bit A/D converter, it stays in the digital domain until it hits the 18-bit D/A converters on mixdown.

The basic unit provides eight tracks, but allows eight "virtual tracks" per track. In other words, if you want to do a guitar overdub, you could record up to eight different versions, and wait until mixdown to decide which track to use. Or, cut and paste the best bits from the eight virtual tracks to create the final track. Actually, you can record eight tracks only with coding. Without any type of coding, it records four tracks.

The basic model lists for \$2495 and includes a 540 MB IDE-spec internal hard drive. Via light data coding, you can record up to 34 minutes on eight tracks at 44.1 kHz (other available sampling rates are 48 and 32 kHz). An optional internal 1 GB Iomega Jaz drive ups the price to \$2895, but gives the advantage of a removable storage medium. The VS-880 is also expandable via SCSI, so you can add up to seven more drives for additional recording time or backup; it's also possible to

back up song data to a conventional DAT deck, providing it has a coaxial digital I/O. One tip: if you have several songs on your hard drive, back up all of them at one time. If you back up only one song from a collection and then restore, it will restore only that one song and wipe whatever else is on your drive. [Roland states that new software updates will correct that. —Ed.]

DIGITAL EDITING

Because the VS-880 is a nonlinear, random access device, it's possible to do nondestructive editing (cut, copy, paste, bounce, etc.). There are up to 999 levels of undo, even after doing multiple editing and recording sessions, and you can cancel the most recent undo with a redo command. Time compression/expansion is also available from 75 percent to 125 percent of the original time; playback pitch remains unaffected. If you do want to change pitch, a varispeed option can change the sample rate from 22 kHz (down approximately one octave at 44.1 kHz sampling rate) up to 50 kHz (about 12 percent higher pitch at 44.1 kHz). The VS-880 also provides for location by beat and measure as

well as absolute time, thus making the device more "musician-friendly."

When you need to get some place in a song fast, up to 1000 "markers" can be entered per song and accessed through the numeric keypad, and eight instantly available locate points can be accessed via dedicated front-panel buttons. All marker, locate points, and mixer settings can be stored and named as a file; the VS-880 stores 200 files total. For detailed audio searches, there's a scrubbing function, and you can also look at waveforms.

MIXER AND I/O

The mixer features 14 channels and four physical inputs (both 1/4-inch and RCA, which can handle signal levels from -50 to +4), one coaxial stereo digital input (analog and digital signal sources can be used for simultaneous mixing of up to 14 channels), eight recording busses, one stereo aux send, one stereo master output, and a stereo coaxial digital output for sending signals directly to devices such as DAT in the digital domain. There's also a parametric EQ (three bands for eight tracks in tracking mode, and two bands for all 14 channels in mix-
continued on page 126



ROAD WARRIOR: The Roland VS-880 is compact and sturdy enough to go where you need it to.

Go To Your Room



Actually, with the powerful reverb algorithms in the Alesis Q2™, you can go to any room you want.

Q2 has the power to take your music to shimmering halls, bright chambers, dark caverns, or anywhere your creativity leads you. There's 300 carefully-designed reverbs, delays, EQ, pitch and special effects that provide the high-end professional processing you need without breaking the bank.

But the best reason to use a Q2 is the incredible flexibility it gives you to create your own space. Because the place where the music sounds the best – the room to be in – might be the room you call your own.



"I love the Q2. I'm using it in the show every night."

— Robert Scovill, 3 Time TEC Award Winner (Sound Reinforcement Engineer)

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— Ray Benson (Asleep At The Wheel), Multiple Grammy® Winner

"Q2 is the presetter's fantasy and the tweaker's dream."

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CIRCLE 03 ON FREE INFO CARD

What do you say
to the world's first
affordable 64-track
Digital Studio Workstation?





Welcome home.

Say hello to the first fully integrated digital recording workstation practically anyone can afford. The VS-880 is for anyone who ever wanted more and more out of their home or studio recording environment.

A 14-Channel Digital Mixer

The VS-880 comes with a 14-channel digital mixer with digital EQ. Fader, pan and mixer parameters can be automated by MIDI control change messages. Internal snapshot automation is included.

An 8x8/64 Virtual Track Digital Recorder

Eight primary tracks with eight levels of virtual tracks give you the ultimate in recording flexibility. Record multiple takes, edit or undo edits and compile the best parts of various takes to create the perfect track without compromise. You can accumulate up to 64 instantly accessible tracks and choose eight for final mixdown.

Digital Mastering

The VS-880 is fully digital and has digital in and out. This makes it compatible with all your existing digital equipment, both linear tape-based and non-linear hard disk format.

Digital Editing

With the VS-880, you get fully non-destructive editing capabilities. You can copy, move, exchange, insert, cut and erase tracks. Because it functions like a word processor, you can select the perfect chorus of your song, copy it or move it somewhere else without re-recording it. Or cut out another section and have the remaining material slide over and fill the open space automatically. And if you're not satisfied with a particular edit, simply return to the previous performance. Instant locate points make editing on the VS-880 as user-friendly as it gets. For advanced applications, functions like Scrub Preview or Time Compression/Expansion are available.



The user installable VS8F-1 Effect Expansion Board adds two completely independent stereo multi-effects processors. There are 200 patches, extensive effects including 3-D RSS capability, and guitar effects chains with COSM-based guitar amp simulator.

Two Digital Effects Processors

A VS8F-1 Effect Expansion Board can be easily user-installed, giving you two totally independent multi-effects processors. Reverb, stereo delay, chorus, flanging, vocoder as well as distortion/overdrive and guitar amp simulation are a few of the effects that can be added during recording or during final mix in realtime. Three dimensional effects based on Roland's proprietary RSS[®] system are also included.

Digital Memory

You can choose the type of memory which best suits your needs. Select a 540 MB internal drive or an internal 1 Gigabyte removable Iomega[®] JAZ[®] drive capable of 500 minutes of recording time. A standard SCSI port allows for easy connection to external drives such as Iomega[®] ZIP[®], magnetic optical or other storage media.

Synchronization

The VS-880 is MIDI compatible for synchronization with MIDI Time Code (MTC) as both a master or slave. MIDI Machine Control (MMC) also allows automated transport control, putting playback, fast forward, rewind and more at your fingertips.

It's time to turn your home or workplace into the studio you've always wanted. Call (213) 685-5141, ext. 798 to order a free demonstration video.



The rear panel has four RCA and four 1/4" inputs, digital in/out, MIDI in/out for sync and automation, a programmable footswitch input, headphone jack, two aux sends, master outs, and a SCSI port for archiving or adding additional storage devices.

VS Studio
VS-880

 Roland[®]

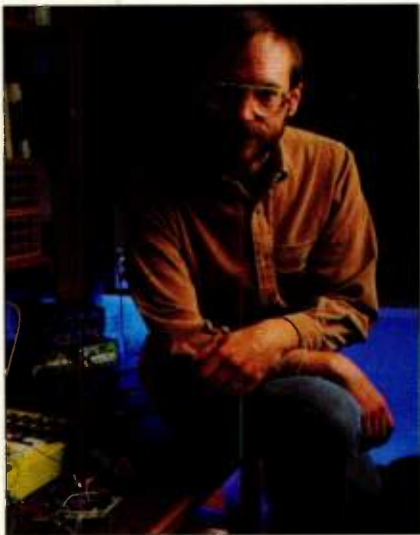
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CIRCLE 67 ON FREE INFO CARD



NAMMAnalysis



The scoop on what went down at the Winter NAMM show

BY CRAIG ANDERTON

The Winter 1996 NAMM show was the most significant show for trend-watchers in years. Seldom have so many trends come into focus at the same time, and many of them revolved around the project studio — the manufacturer's darling for the '90s, as MIDI and synthesizers were for the '80s. There's plenty else in this issue that covers the show (like our Product Views, Studioware, and Gear for Your Next Gig sections); in this column we'll turn on the magnifying glass and examine the ramifications of a few of the more interesting trends.

STILL SPINNING AFTER ALL THESE YEARS

Those concerned about the health of DAT can rest easy. Not only are older decks still in production and tape quality improving, but new models are being introduced. TASCAM's \$1100 DA-20 is a clear contender for project studios, and Sony also recognizes those who use DAT: they offer a musi-

cian-oriented footswitch controller option for the new DTC-A8. Meanwhile, Panasonic updated their very popular SV-3700 into the SV-3800. It looks like DAT is here to stay, at least until something optical comes along. And speaking of optical...

MD GETS SOME RESPECT

It's not exactly a trend yet, but when a company like TASCAM throws its weight behind a format, that's significant — and TASCAM introduced not one, but three MiniDisc-based products. The MD-801R is a 2-track MiniDisc recorder with the look and feel of the familiar DA-30 MK II, but offers the advantages of random access (the related MD-801P is a playback-only device).

But the real surprise was the 564 Digital Studio, a 4-track, MiniDisc-based, integrated studio. One of its biggest advantages is a removable media cost of \$20 — not as inexpensive as cassette or videotape, but the lowest cost so far for a random-access device. It also brings the concept of premixing to a new level, since you can record a "song" on part of the disc, then add parts and "bounce forward" to a new song that contains the premix and new parts. Because you haven't gotten rid of the premix, you can always go back to it. It's a primitive form of undo, but undo nonetheless. The more I think about it, the more it seems TASCAM has exploited this medium in a pretty creative way. We'll see how the market responds.

A REMOVABLE MEDIA STANDARD?

Hard-disk recording has lacked two important qualities in the competition with digital and analog tape: a removable storage medium and a standard file format. With regards to storage, the \$600 Iomega Jaz 1 GB hard drive (\$200 per cartridge) may be the answer. This drive is featured in options for both the Roland VS-880 and E-mu Darwin stand-alone hard disk recorders, and has become an integral part of many studios that use existing hard-disk systems.

Granted the cartridge costs much more than an S-VHS or Hi8 cassette, but comparisons to a reel of 2-inch

analog tape puts matters in perspective. Eventually, 1 GB cartridge prices will fall somewhat — not dramatically, perhaps, but it's conceivable we'll see \$150 cartridges after the demand has peaked.

Now we need a standardized file format so that you can take the Jaz cartridge your associate recorded on a Darwin and put it in your VS-880 to do a few overdubs before taking it in to a Pro Tools-based facility. Well, I can dream, right?

SIGNAL PROCESSING TRENDS

It seems the trend to use extreme amounts of signal processing is on the wane (except for guitar-oriented boxes, where chains of effects are still important). Instead, the quest is for good compressors, reverb, and EQs, with software plug-ins and vintage effects picking up the slack for the esoterically oriented.

The digital multitrack explosion (tape and hard disk) has influenced signal processors in three ways:

- *Multiple units with independent processors in one box.* This trend started with Ensoniq's DP/4; now DigiTech's Studio Quad does four full-function effects in one box. Both Ensoniq and DigiTech have also released two-channel versions (the DP/2 and Studio Twin, respectively). Octal processors are hot as well — this started with the Symetrix and ART 8-channel compressors, and has been joined by ART's Pro Gate and the PreSonus ACP-8, featuring eight compressor/gates.

- *Ultra-high quality mic preamps.* Clean recording media no longer mask deficiencies in the signal chain. Nowadays, people often want mics to bypass the board and go directly into recorders, necessitating ultra-clean mic preamps. Fortunately, a new generation of mic preamp chips, better tube design techniques (such as Aphex's "tubessence"), and enhancements to the microphones themselves have come to the rescue. We're also seeing more "all-in-one" mic processing strips à la the DigiTech VTP-1 (tube-based mic pre, equalization, effects loop, phantom power, and, with this particular unit, 18-bit A/D conversion for feeding digital source inputs).

The RØDE™ to Recording Success Starts Here...



The real passion behind a hit song lies in the performance. You want all the emotion and the expression of the performance to burst onto the track and shine its way through the mix. Whether it's a truly great take or just a happy accident, you want that moment captured in all of its glory. When that inspired moment occurs, you need to have the right mic...the RØDE™ NT2. The RØDE™ has all the special stuff:

- **Dual Gradient Transducers with Large Diaphragm and Gold Plated Membrane** to warmly receive and translate the full body of the performance
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• *Tubes everywhere.* Countering the complaint that digital is too clean, companies are rushing to put tubes in the signal chain. Whether DI boxes, preamps, equalizers, or compressors, the future of tubes continues to glow brighter every year. I'm half-expecting to see a tube synthesizer one of these days.

THE FINAL CONFLICT?

IBM and Microsoft had booths at NAMM, while Apple did not — but that wasn't the only sign that the PC is running away from the Mac in terms of

program development. Sure, reports of the Mac's demise are probably premature, and new programs continue to appear (BIAS's new "Peak" will more than pick up the slack when Digidesign phases out Sound Tools, and Antares's SST is a slick way to compensate for speaker response anomalies). More and more, though, it looks like people buy a Mac for two reasons: Opcode's suite of programs (integrated operating system, hardware, and applications) and/or Digidesign's Pro Tools, which continues to be such an industry stan-

dard that it attracts the "best and the brightest" in 3rd party support. This isn't to slight MOTU, Steinberg, and Emagic (who, significantly enough, are doing more and more development for the PC). However individual programs no longer a platform make, since programs are often available on multiple platforms anyway.

For the PC, plug-ins are appearing for Sound Forge, which is becoming the "Sound Tools" alternative. WAVES' popular L1 plug-in (the secret weapon for multimedia developers) is being ported over, as is QSound's 3D sound plug-in. These join Sonic Foundry's own plug-ins, which include spectrum analysis, noise reduction, and de-clicking. Also, IQS needn't feel quite so lonely anymore, since their SAW Plus hard-disk recording system has been joined by MSI's "Digital Wings for Audio," which uses a unique hardware/software combination to allow playing back up to 128 tracks simultaneously from a standard PC or compatible.

Although PC MIDI + Digital Audio (MDA) sequencers have not reached the level of sophistication of their Mac counterparts, just about all PC MIDI products now allow for recording at least a couple tracks of digital audio, and the introduction of Digital Audio Labs' V8 card provides the missing link for the PC that Digidesign provided for the Mac with their Sound Accelerator series.

I don't think Apple's going to go away; their products are just too valuable for the graphics community, and that market will stick with Apple as long as Apple produces computers (and then some). And there are still some problems with Windows 95, like MIDI timing (and where's OMS?). But the music industry is very price-sensitive. If Apple focuses on the high end, as many analysts urge, the project studio will become the PC studio.

I'm rooting for Apple — after all, if they hadn't been around to set the standards, I doubt that Microsoft would have felt the competitive kick that propelled Windows 95 closer to the Mac's famous ease of use. Regardless of what happens with Apple, however, the PC is here to stay in a very big way. **EQ**

M-1

MICROPHONE PREAMPLIFIER

(ACTUAL SIZE)

"No comparison!" "Whoa!" "Even the producer could tell the difference!"
A few typical comments! The M-1 is clearly superior. Here's why:

The JENSEN JT-16-B INPUT TRANSFORMER, IMPROVED!
The world's best mic-input transformer, now even better!

THE 990 DISCRETE OP-AMP. The 990A-24V is far superior to the monolithic op-amps found in other equipment.

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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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For those of you who have been clamoring for Craig's Annual "Anderton Awards," yes, we have them, but we ran out of space. Look for them next issue.

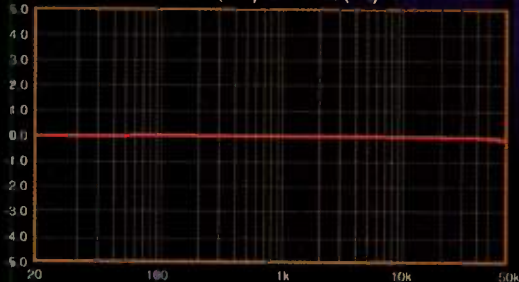
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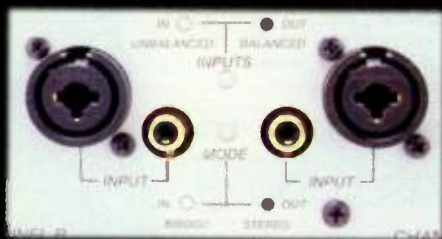
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AMPL (dBr) vs FREQ (Hz)

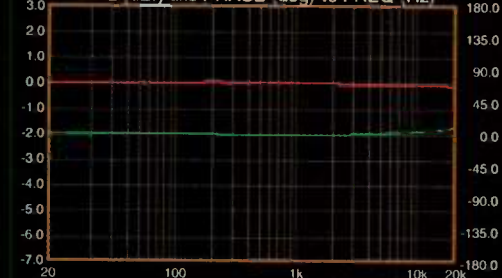


The RP™ 500 MOSFET studio reference power amplifier gives you the purest audio signal that money can buy. Throughout its development process, close attention was paid to every detail to ensure superior sonic performance. The RP 500 is accurate, translating into a perfect mix!



Frequency response, phase and signal-to-noise are technical terms that may make your brain hurt to think about, but they mean everything to the accuracy of your mix. Many amplifier companies strive for excellence in one area, being excellent in all of these is what makes the RP 500 the perfect studio amplifier.

AMPL (dBr) and PHASE (deg) vs FREQ (Hz)



AMPL (dBr) vs FREQ (Hz)



PURE IMAGE The RP 500 has an exceptionally smooth phase response which enhances the stereo image. Phase shift can cause phase cancellations in the mix position, which leads to a "smeared" or reduced stereo image found in other amplifiers.



It is important for a studio amplifier to be quiet. **IT'S SILENT!**

Traditional amplifiers produce electronic noise from op-amps and mechanical fan noise, which is unacceptable in the studio. The RP 500 uses convection cooling for quiet installation, and an all discrete transistor design provides signal-to-noise of -110 dB (UNWEIGHTED). Therefore, you hear the mix and not the amp.

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Line amp, balanced ins & outs, unbalanced compatible, level matching for -10dB & +4dB equipment.



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Mic & instrument inputs, peak LED, +48v phantom power, switchable sensitivity, variable gain control, rack ears included.



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Pete Bellotte (Songwriter/Producer - Donna Summer, Elton John, Janet Jackson) - "Recording through the VI-1 interface makes a world of difference - drums become not just punchier, but clearer - more defined."



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4 band valve equalisation, balanced busses, valve mix amps, balanced outputs, Link facility providing 16, 24, 32, etc channels.

M-2 8:2 Valve Mixer

As the M-1 plus 100mm faders, 2 AUX's per channel, 2 stereo FX returns, channel direct outs switchable pre/post EQ & post fader, comprehensive link facility

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Nigel Lewis - Soul City Productions (Songwriter / Producer - Eternel, Dina Carroll, Louise) - "The EQ-1 Equaliser warms up vocals and adds quality to the bottom end, and the C-1 Compressor makes a ruff bass sound like a million dollars... Amazing sound!"



Chris Porter (Producer - Take That) - "I bought one of the first EQ-1s and I've enjoyed using it immensely. It gives a unique quality to the vocals in particular - Take That's 'Back For Good' is a typical example of the EQ-1 adding depth and presence to a vocal track."

Miking In-choir-y

How to use an unusual mic setup to capture a choir

BY BRUCE SWEDIEN

Making a truly superior recording of a choir is really fairly simple once you understand a couple of things. First of all, you need a truly superior choir! Of course, I am kind of spoiled because with the projects I normally work on, I usually get to work with a choir like the Andre Crouch Choir (which I consider to be one of the best choirs in the world).

Next, I look for a studio with a very musical sound, and by this I mean a studio built by someone who is aware of the refinements of studio design. I like room proportions that are such that standing waves are minimal. Usually a nonrectangular room gives the best diffusion and the least voice coloration. The studio that I like to use for this type of choral recording is Westlake Audio's Studio D in Hollywood. This magnificent studio was designed by Glenn Phoenix of Westlake Audio. Because of its fantastic sound on voice, I often use this studio for choir recordings.

MIC MOVES

My favorite mics for recording a choir are my two identical Neumann M49's (they are consecutive serial numbers that I bought new in 1962). They are the pair that you saw in the Micro-Phile a few months ago. [That photo is also shown on page 50. —Ed.] That photo very clearly illustrates a pretty standard "X-Y" situation with these two microphones and that is the way I have used them for recording the Andre Crouch Choir.

In the August 1995 issue of EQ, we ran a Micro-Phile on Bruce Swieden's Neumann M49 microphones. In that article, Swieden discussed a rather unorthodox mic technique that drew a large response from our readers. Here is a detailed description of how Swieden uses that technique in the recording of a choir.



Photo by David Goggin

THE SECRET'S OUT: Swieden spills the beans on how he gets his distinct sound.

Inasmuch as I usually set the mics to the omni polar pattern for this technique, I have a feeling that perhaps the term "coincident pair" might be a better description for this application. By definition, when a coincident pair of microphones is used in any non-MS configuration, the two microphones are frequently identified as an "X-Y" pair. They can also be set to bidirectional and they will do essentially the same thing. [The M49 has three switchable pickup patterns: omni, bidirectional or cardioid, controlled from the power supply. —Ed.] They could be set for cardioid, but then you will have to deal with the fact that there will be a dead side to the mics. You will also need to pay a lot of attention to the front side of the mics — the coincident axis will have to be aimed at the sound source. The way I use them in a choir recording is usually in omni.

I put the choir in a circle about 30 feet in diameter around the two microphones so that the singers are about 15 feet away from the mics. I will move the choir members further away from or closer to the mics if the balance needs help, and from that point on, the room does all the mixing. Of course, I have the choir standing (not sitting), and the mics are placed

between four and five feet high, just near mouth height. Once you have the balance of the harmonies and vocal timbres set, the room really does all the work. From this point on, if you can find the red button all you have to do is put tapes on the machine and sit back and listen.

I'm sure you have heard "Man In The Mirror" from Michael Jackson's *Bad* album or "Will You Be There" from M.J.'s *Dangerous* album. These two pieces are classic examples of my recording the Andre Crouch Choir using these two mics in an omni "X-Y" or coincident pair setup. Now more typically, some engineers would use the mics set to cardioid for the "X-Y" technique.

What happens when you use them in cardioid is that you basically end up with a directional microphone system. The reason that I use the mics in omni for "X-Y" is that, primarily, what I am trying to achieve is to get the arrival time of the sound from the source to hit the two capsules at as close to the same moment in time as possible. This way there is little phase difference for any given frequency in the output of the two mics. As a result, you will get a dense, wide feeling of a very unified choral sound. Of course, the sonic image that you get has almost no left/right intensity.

Because of the fact that there are virtually no phase problems, this technique makes the most incredible



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In addition, I have also always had a feeling that by using these microphones set to the omnidirectional polar pattern, there will not be any off-axis coloration. Off-axis coloration is a distortion of frequency response that gets progressively greater as the arrival angle of the sound increases. This type of distortion would be the greatest with the mics set for the cardioid polar pattern. As an additional bonus with this technique, I think that the acoustics of the room and particularly the early reflections from the sound source are heard very accurately by the mics, and thus preserved in their natural order.

IN THE MIX

I will then connect these two incredible mics to my Neve 1084 discrete Class A mic preamplifiers, which I consider to be the close-to-ideal audio signal path as far as microphone preamps. These mic preamps are the same as those that might have been

found in a Neve console, probably in the early 1970s. I have a bunch of them that I carry with me wherever I work, and two in particular are in an elegant oak case that I take with me just for choral and vocal recording.

For these recording sessions, I will invariably go so far as to bypass all the studio microphone wiring. I run Monster Cable microphone cables from the studio under the control room door into the Neve 1084's. If I have enough time to run back and forth to set a little EQ, I will put the Neves out in the studio so that the mic-level signal path is very short. I use Monster Cable and come out of the 1084's and go to the tape machine either through the jack-field or straight in. I try to bypass the console as best as I can.

Most of these newer consoles have a lot of ICs — even in the bussing stages where you think that the signal is at line level and is pretty safe from too many amps in the circuit. Each mic is then recorded to a separate track. When I mix, the tracks will be panned hard left and hard right. When you are trying to retain

an acoustical image in its entirety, you will minimize its drama if you don't pan the tracks hard left and hard right.

TRAP KEEPER

If that isn't enough, I always take my

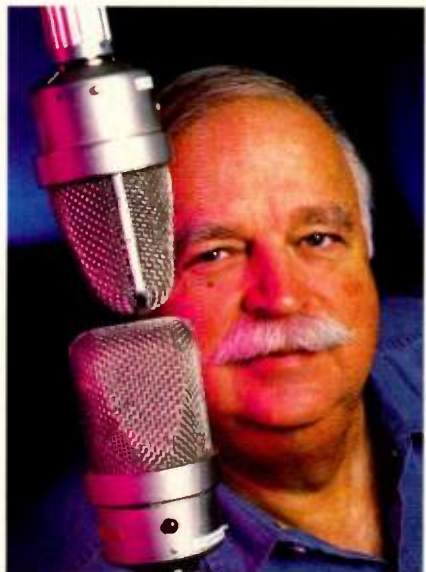


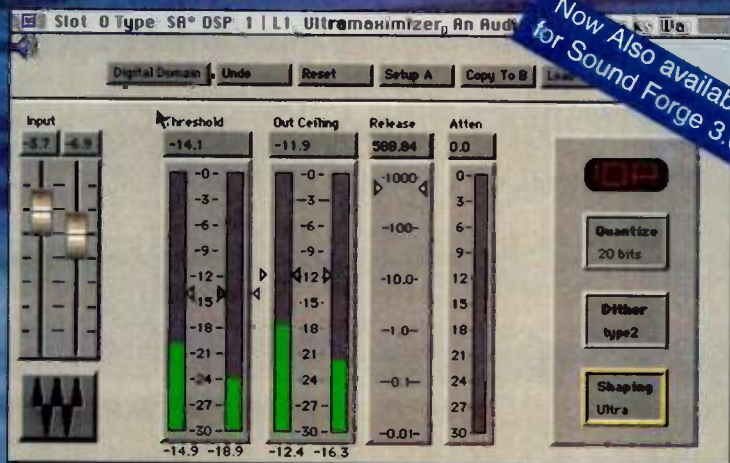
Photo by Julian Jaime

REPLAY: The photo in question.

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ASC (Acoustic Sciences Corporation) Studio Traps with me to my recording sessions. I have the traps that are five feet high and maybe nine inches in diameter. The Studio Trap is adjustable for height. Each trap actually has two sides with little marks to identify them: one is reflective and the other is absorptive. In certain recording situations, I won't pay too much attention to those little marks! I wouldn't carefully organize them, aimed in one direction or face them all in one neat little row or something. I'll generally make a random Tube Trap setup and try to get the room to sound as natural as I can. I usually put the Traps more towards the outside perimeter of the room and not between the sound source and the microphone.

If the room has an area that might be sonically hot or too reverberant, or if I hear a reflection or standing wave I don't like, I can use the Studio Traps to change the soundfield. They make a dramatic difference. In *this* situation I always pay attention to those marks that identify which side is reflective and which side is absorptive. You can experiment by starting out with a lot of Tube Traps and then remove them two at a time — you will hear the sound liven up incredibly. They allow you the ultimate control of the room reflections mixed in with the direct sound, almost like having movable walls.

Here's something to remember: this microphone approach doesn't allow you to do any remixing or rebalancing of the "X-Y" stereo image, so you have to go for your balance while you are recording. I have always felt that this is good mental discipline.

Although proximity effect does also apply to omni, it is not nearly as exaggerated as in cardioid, so you won't have one mic with more proximity effect than the other, emphasizing the low end a little more and thus distorting the stereo image. It takes a little bit of experimenting, but this microphone technique will very definitely hear the source as it sounds in the studio. Usually, just playing back a take for the choir will let them hear what parts need to be made louder or softer.

The omni "X-Y" or "coincident pair" microphone technique is decidedly forgiving as far as balance is concerned, so if the music you are recording is in balance in the studio, then it will go to tape in balance. 

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Reader Survey Results

We asked, you spoke — here are your answers to the questions posed in the October issue

On page 90 of the October issue, we ran the 1995 Reader Survey that asked your opinion on several topics. The reason for this survey was twofold: first, we wanted to know what you want to see in these pages; and second, we wanted you to have some fun — and you did. The following is the result of those probing queries.

PEOPLE'S CHOICE

This section asked that you pick your favorite person, place, or thing — and your creativity thrived. We can't print all the answers we received, but here are the best ones.

Best New Product (released in '95). The ones that kept popping up were the Yamaha 02R digital console and the Lexicon PCM 80 processor, but someone actually felt that the most interesting new product is Prozac.

Best Product Under \$500. Prozac made another appearance here, but the Aphex Expressor, Behringer Composer, Mackie 1202, and OSC Deck II v. 2.5 were also mentioned repeatedly. Some other goodies include: a pack of Camels (we assume that the cigarettes are implied — not a bunch of humped animals), a Makita cordless drill, and a guitar pick. One hapless engineer didn't know what an under \$500 product was, and still another nominated lemon ice Gatorade.

Best Product Over \$500. So this is where you're spending your money. Some of the responses include the E-mu ES1-2 and Darwin, Roland VG-8, Sony TCD-A7 DAT, TL Audio tube compressor, Digidesign's Pro Tools III, Mackie LM-3204, Yamaha ProMix

01, Drawmer 1961, Alesis QuadraVerb II, and the Soundtracs Topaz console.

Favorite Recording Engineers. Your favorite knob twiddlers include Roger Nichols (don't think we didn't recognize your handwriting Roger), Rudy Van Gelder, Bob Clearmountain, Geoff Emerick, Alan Parsons, Tom Jung, anyone who's worked with Frank Zappa, Al Schmitt, George Massenburg, Tony Visconti, George Martin, Flood, Bruce Swedien, and Ed Cherney, among others. Apparently shyness isn't an issue with the typical EQ reader, as "Me" was nominated more than any other engineer.

Favorite Producers. Judging by the numerous mentions, Don Was is the person you'd most like to be behind the board with. Runners up include George Martin, Trevor Horn, Mitchell Froom, Hugh Padgham, Frank Zappa, Brian Eno, Daniel Lanois, Steve Albini, Al Schmitt, Ric

Wake, Rick Rubin, Tony Visconti, Jeff Lynne, Todd Rundgren, Al Jorgenson, Phil Spector, Butch Vig, Phil Ramone, John Paul Jones, Q, Jimmy Jam & Terry Lewis, and Danny Kortchmar. "Me" once again made several appearances.

Favorite Live Sound Engineer. It was here that we noticed some hostility crept into the survey. Some of the responses include, "whoever gets the job done without killing my ears," "clubowners — they know it all," "dead ones or ones that don't show up," and "I hate them all — *always* too much kick!" Name-wise, we saw Roger Nichols, M.L. Procise, Sahlom Aberle, Dan Healy, Joe Kahn, Jim Yakabuski [Van Halen], and Joey Ramone (Joey, why didn't you tell us you were a live-sound engineer). Of course, the ever-present "Me" put in a very solid showing.

Your Favorite Product Wish List. Dare to dream — here's what you really want: Avid



Illustration by Mike Browne

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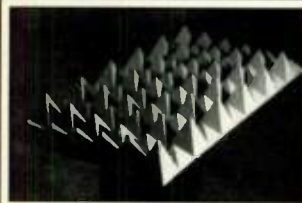
art of reference monitor loudspeakers, scurry to produce products to compete with Tannoy's original highly acclaimed and award-winning PBM series, **Tannoy moves on.**

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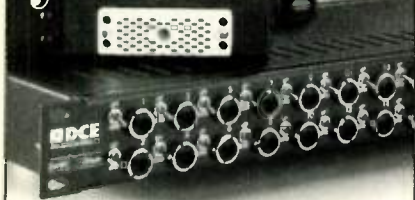
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Best Commercial Studio. We know, we know: Why should the pre-eminent project studio magazine give a fig about the big guns? We figure that sooner or later you'll go slumming at one of these places, and here are some of your favorite haunts: Hit Factory (NY); Bias Recording (Springfield, VA); Electric Lady (NY); Sounds Interchange (Toronto, ON); Ocean Way (CA); Lunquest (England); Gold Star (Los Angeles, CA); and Abbey Road (England).

Favorite Live Sound Venue: These are the places that you feel make live sound engineering worthwhile: Graffiti (Pittsburgh, PA); Hollywood Bowl; Molson Amphitheatre (Toronto, ON); Palo Duro Canyon "Texas!" Stage (Amarillo, TX); Grand Ol' Opry (Nashville, TN); Tobacco Road (Miami, FL); 5th Avenue (Seattle, WA); CBGB-OMFUG (New York, NY); and the Capitol Center (Largo, MD — respondent adds, "Best sound, best bathrooms").

Favorite Snack During Long Sessions: Judging by the entries in this field, may we suggest that you stop worrying about digital or analog tapes and instead invest in an exercise one. Some of the more interesting consumables include Thai food (we hope you work alone); beef jerky; Ben & Jerry's deep dark chocolate ice cream; Crush cream soda with burritos; popcorn with tons of butter "so I can get those knobs really slick"; Jolt cola; menthol cigarettes; possum jerky; Vicks Nyquil; Pepperidge Farm Geneva cookies; Met-Rx; Ritz crackers with Kraft cheese; Keebler Fudge Stripes; and sourdough pretzels.

Accessory You Couldn't Live Without: These ranged from the sweet ("my wife") to the scary ("the lock on my studio door and my taser") — and everything in between. Faves include a bottle opener; Eventide H3000SE; Sharpie pen; Popper Stoppers; SansAmp fuzz pedal; "my creativity"; Leatherman multitool and Maglite; "my personal gig bag full of SM58's"; good ears; a watch; John Hardy M-1 mic preamp; dbx compressor; Swiss



Army knife; and "my bar stool behind the console."

Best Engineered Album This Year.

Among the new songs admired by studio pros this year include: Annie Lennox, *Medusa*; Sheryl Crow, *Tuesday Night Music Club*; soundtrack to *Apollo 13*; R.E.M., *Monster*; Björk, *Post*; Emmylou Harris, *Wrecking Ball*; Pretenders, *Last of the Independents*; Van Halen, *Balance*; Little Feat, *Ain't Had Enough Fun*; Hootie & the Blowfish, *Cracked Rear View*; and Garbage, *Garbage*.

Best Engineered Album of All Time. We suppose that many of you felt the answer to this question was obvious, as many answers were followed with the word "duh." Still, the responses varied. Here's the best of the best: Donald Fagen, *The Nightfly*; The Beatles, *Sgt. Pepper* and *White Album*; Pink Floyd, *Dark Side of the Moon*; Frank Zappa, *Civilization Phase Three*; Led Zeppelin, *Physical Graffiti*; Dire Straits, *On Every Street*; Kansas, *Leftoverture*; Journey, *Captured*; Paul Simon, *Graceland*; Sex Pistols, *Never Mind the Bollocks*; and David Bowie, *Ziggy Stardust*.

READER RAMBLINGS

In the third part of our survey we gave you a full line to fill with your thoughts, dreams, inspirations — and smarmy comments. So we'll shut up here and let you do the talking.

The worst thing about working in audio is...a--hole clients; unreliable gear; ground loops, hum, and hiss; the pay; the hours, talentless musicians; mob influence; lack of sunlight; keeping up with the Joneses; being just one step ahead of the bill collectors most of the time; people who "know it all"; non-pros who don't understand what I *really* do; listening to the same tracks 700 times; cleaning the toilets; load out; serving the massive, greed-driven record business; schlepping equipment; and "could you turn that guitar down please" repeated 75 times.

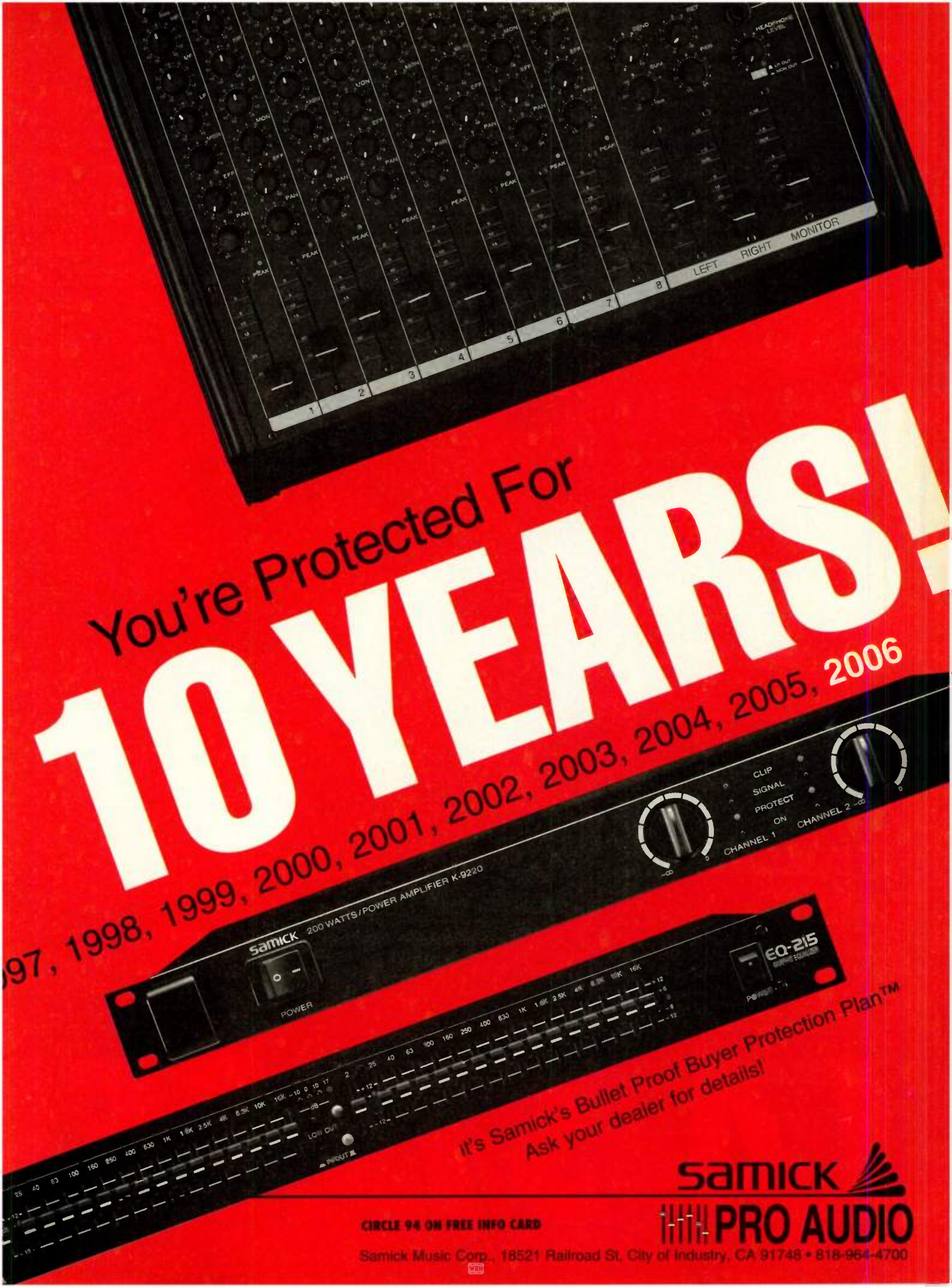
The best thing about working in audio is...capturing magic on tape; it's fun; music and creative energy; talented musicians; nice people; the clients; when the audience goes away happy with your work; experimenting; making an artist sound as great as they are; twiddling knobs; being my own boss; mixing; the toys; showtime; free beer; the finished product can be heard by other human beings; those rare moments of

continued on page 129

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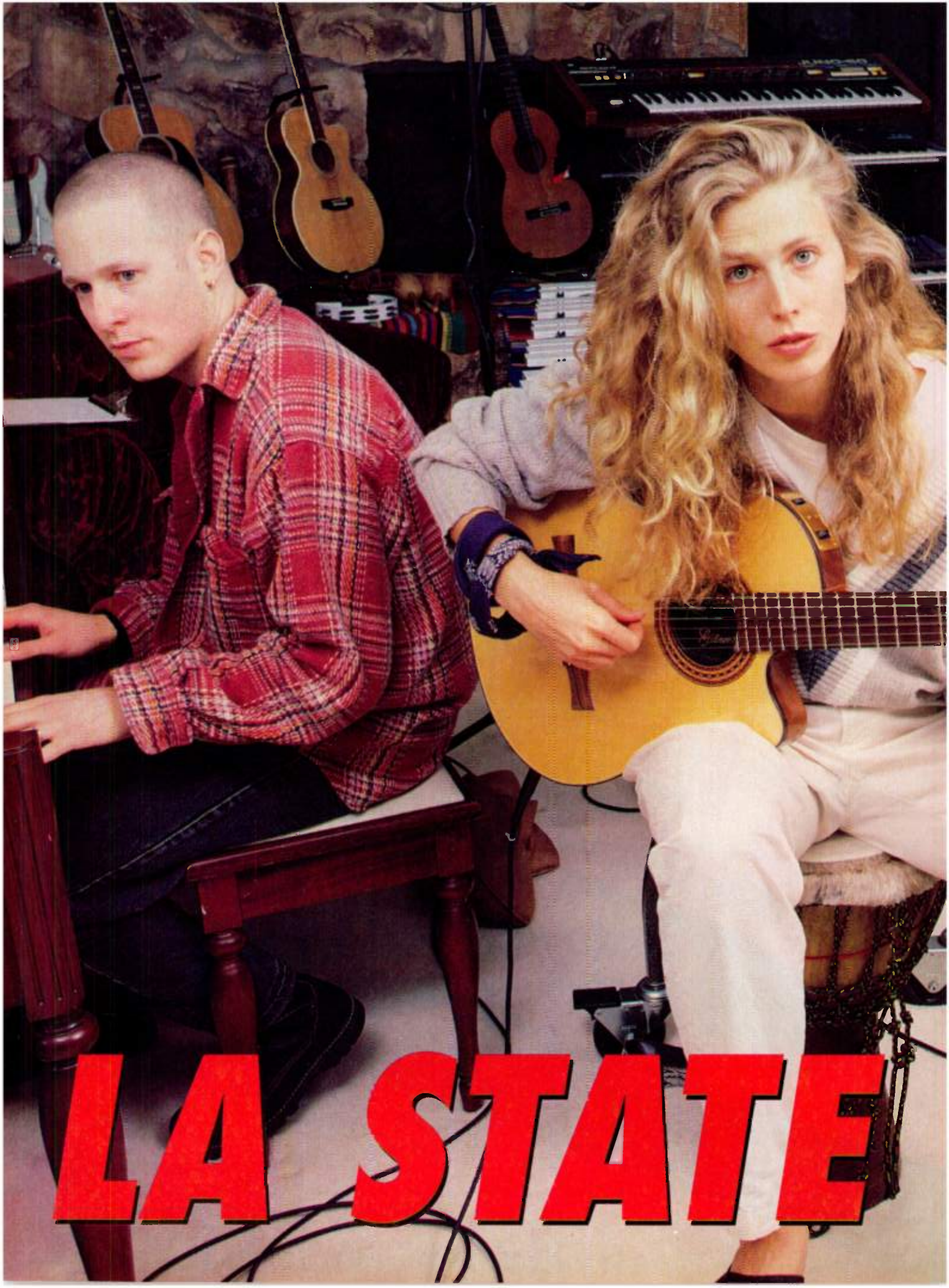


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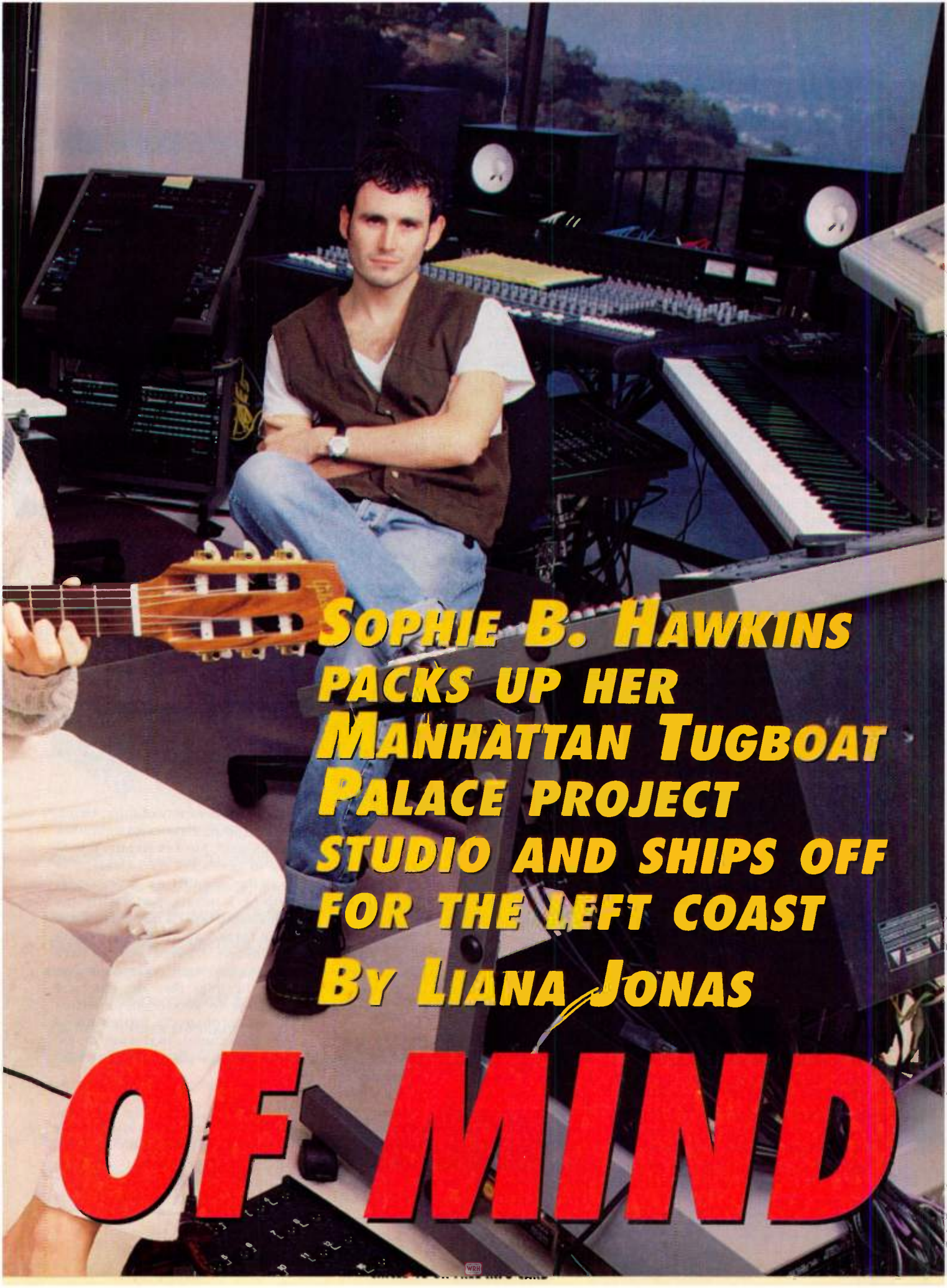
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PRO AUDIO



LA STATE



**SOPHIE B. HAWKINS
PACKS UP HER
MANHATTAN TUGBOAT
PALACE PROJECT
STUDIO AND SHIPS OFF
FOR THE LEFT COAST
BY LIANA JONAS**

OF MIND



LA STATE OF MIND

cable among hundreds. "I'm always alone in my studio, and I never have an engineer. If a machine craps out, then I've got to seek outside help. That's what I find to be the biggest problem of having a project studio. The solitary aspect of having your own studio is a drag, and sometimes in the wee hours of the morning you don't want to call someone up and say, 'Oh damn, my ADAT broke.'" As a matter of fact, during this interview one of her older ADATs was not arming tracks from the

BRC or at the unit itself, and would pop out of record mode at random, but a later call to Sophie revealed that an Alexis rep modified the sync mechanism in the faulty ADAT, and all is now well.

Despite her recent experience, Hawkins is quick to recount the ADAT's finer qualities: "I can sing passes from anywhere in my studio. This is because I have my headphones connected to the BRC, and that gives me the freedom to move around when I record myself. I can't really do overdubs by myself, par-

ticularly if my hands are on my Chet Atkins guitar (an acoustic guitar); I can't punch myself in. But this is good because it forces me to do full passes, and I like that."

LIVE AND LEARN

Just recently Hawkins came across another impasse — headphone distortion. She is used to plugging her headphones directly into the console, and had never experienced level or distortion problems. New to Four Sheets to the Wind is a Whirlwind Medusa 16-input mic panel, which is routed directly to the Mackie 32•8 by way of a 50-foot snake. (Hawkins previously routed mic inputs directly to the board.) Sophie plugged her headphones directly into one of the Whirlwind's four stereo inputs and, of course, just got a whole lot of distortion. Correcting the situation is a Crown 75 x 2 power amp that is used to power the cue system. A headphone cue box is connected to the Crown and that's where Hawkins now plugs in her 'phones.



THE MAKING OF A SONG

Already hard at work in her new studio, Hawkins has recorded three new songs. She does follow her own songwriting formula, which includes no sequencing whatsoever. First she lays down close to seven minutes of drum machine on two tracks, then she records her Chet Atkins guitar by close miking her Gallien-Kruger amplifier with her one-and-only AKG C414. At this point, she will cut her lead vocal track. "I hate to use compression when I record my vocals," Hawkins comments. "It just doesn't work with my voice. So what I wind up doing is riding the gains. Before I start recording, I set my levels to a point that even if I

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scream, I'm not peaking. Then I move closer or further away from the mic, depending on what the level is doing." Wrapping the session up are some other guitar and percussion tracks.

The drum sounds are achieved through a unique miking technique. "We use three room mics to record the GMS drum kit; maybe we'll throw up a mic for the kick," states Vallier. "We don't close mic each piece because this room sounds best with the three room mics. I know this sounds crazy, but the drum kit tracks come out so good. We don't even use matched mics on the kit. We'll mic the room with a Shure Beta 58 and a Beta 57, then we'll put an SM57 on the kick. The result is a good, raw sound. Sometimes we position the Audio-Technica mic facing straight down at and above the drummer's head. When Sophie first started working in this studio, there were only two mic stands, so we'd place a mic on top of a box or something, nothing was ever at the same height level. But this room has such great isolation and amazing natural acoustics that we can be unconventional. The room creates such a good room sound, that there is no need to juice up the drum tracks with any effects."

HERE, THERE, EVERYWHERE

The terrace, the bathroom, and the garage are all locations in the Hawkins house that are used for recording, once again tapping into the natural acoustics and room sound. Hawkins notes that the 50-foot length of the Whirlwind Medusa's cord will allow her to go to any one of these places, and maybe even beyond. **EQ**



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CONSOLE 1996



EQ TAKES A LOOK AT THE YEAR OF THE PROJECT STUDIO MIXER

As the project studio expands its prominence in the recording scene, so does the project studio mixer. Scores of manufacturers have targeted the market for personal production tools, with new, cost-effective consoles. How can you keep track of all the new models? Simple. Start reading this special section. And take notes...there will be a test (board exam?).

MY ULTIMATE PROJECT CONSOLE

In the early days of my career, mixing console facilities were quite limited and it was relatively easy to optimize audio performance. Things began to change with the increase in tape tracks and the advent of more and more processing devices. The console tended to become a huge input/output matrix and control center, its main function being to provide assignment switching, automated mixing capabilities, and monitoring. It seems also that, as newcomers entered the field, some confidence was lost in the ability of modern consoles to provide the best sound quality. More circuitry was packed into the available space, so audio quality was inevitably going to suffer to the advantage of functionality — or so it was suggested.

Consequently, dedicated microphone amplifiers or equalizers sounded better than many modern consoles, and therefore outboard equipment was used to record signal directly to tape, bypassing the console. Although it could be argued that if you are mainly using outboard modules, the quality of the console is unimportant, but this is not really true. Even if only used as a monitor, it must reflect the signal accurately. If there is a dirty window between you and the great picture, how are you going to appreciate its beauty?

The result has been a return to a recording method similar to that found in the early days, where a range of audio boxes would be connected together as required. This has led to the creation of my modular SYSTEM

9098, based on circuitry developed for my 9098 console. Sales of the SYSTEM 9098 EQ have been incredible and demonstrate the desire of the industry for the type of audio performance I have always provided. Various other SYSTEM 9098 products are under development or are available, including microphone amplifiers, a new compressor, and the Mixette.



The function of the Mixette is to enable audio perfectionists to link prized components into a highly personalized production system without incurring the expense of a complete console. Naturally, my intention was for the Mixette to be used with other SYSTEM 9098 components primarily, but the interface is suitable for use with many types of equipment, both modern and vintage.

The Mixette is comprised of sets of self-powered rack-mountable line input modules with fader, pan pot, aux sends, balanced insertions, and the basic channel monitoring you would

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BY RUPERT NEVE**

CONSOLE 1996

expect. Multiple Mixettes can be linked with common bussing to provide a larger configuration. And for those wishing it, AMEK SUPERMOVE Moving Fader automation can be added.

The units can either be flight-cased — ideal for location work — or built into console furniture. Mixing busses are balanced, ground-free, and

may be used at any reasonable distance from the input units. Thus you have here a system that can be configured for a variety of bussing arrangements with the great advantage that you can choose your input modules. Channel width is 1.75 inches, and this means that you can stack SYSTEM 9098 EQs in-line above (or any other

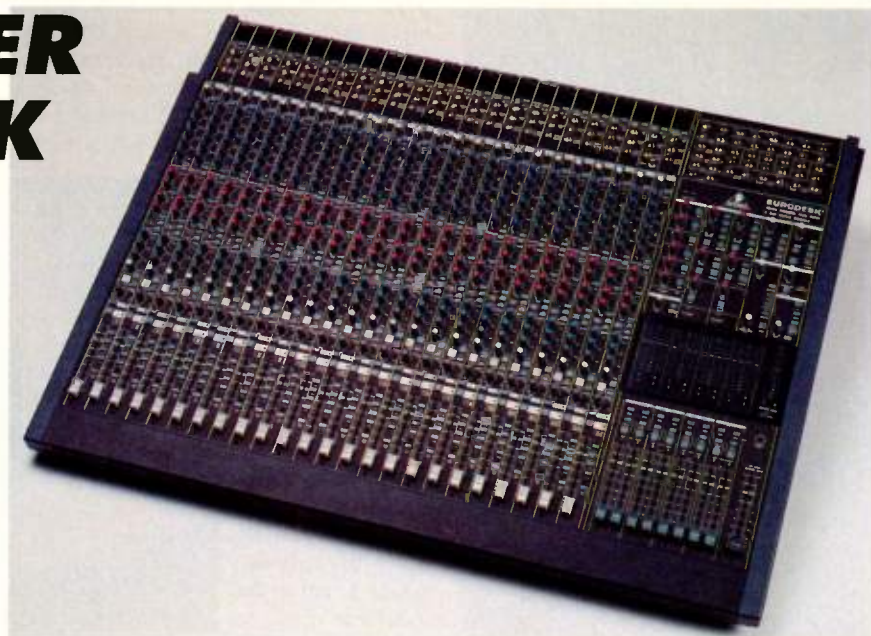
module of appropriate width). Favorite input modules, such as my old "classics," can be used either flight-cased or racked.

Mixette performance, needless to say, amounts to virtual transparency. You will find the character of whatever you feed in faithfully present at the outputs — no character assassination!

BEHRINGER EURODESK

The Behringer name is probably best known for outboard signal processors, but at the 1996 Winter NAMM show, the company threw a curve to the entire audio industry by introducing the Eurodesk MX 8000 — the company's first recording console. Clearly aimed at the project recording studio market, the Eurodesk is ready to go up against the offerings from other manufacturers. In fact, any engineer familiar with the Mackie 8•Bus series will be quite comfortable working on the Eurodesk MX 8000.

The Eurodesk MX 8000 is a 24-channel, 8-bus console with an inline design that accepts 60 balanced line inputs on remix (48 channels plus 12 effect returns). There are two inputs per channel: main and "B channel," each with EQ, pan, mute, and level controls. The main input is on a 100 mm sealed Panasonic fader, and the B channel input is on a rotary fader. During tracking and overdubbing, the main path would carry a mic- or line-level input and the B channel would carry the tape return. For remixing, Behringer gives you a fader flip switch



that puts the tape track on the main fader. Direct outputs and inserts are available on the 24 main channels (as well as on group and main mix outputs), and tape returns and direct outputs are switchable to operate at either -10 dBV or at $+4$ dBu. Behringer's "triple bus" design easily accommodates a 24-track setup by providing three (balanced) output jacks per bus. The intention is that when the studio wiring is laid out, bus 1 is routed to tracks 1, 9 and 17; bus 2 is routed to tracks 2, 10 and 18, etc., so that any input can be routed to any tape track without patching. LED meters display signal level from -40 dB to $+10$ dB for each bus and the main L/R mix output.

Unlike most mixers in this price range, the Eurodesk actually has separate EQ sections for the main and B channel input paths. The main path has a low-cut filter (-18 dB/octave at 100 Hz), 12 kHz high- and 50 Hz low-

shelf, high-mid sweepable from 100 Hz all the way to 20 kHz, and low-mid sweepable from 50 Hz to 3 kHz. The B channel input has the same high- and low-shelf EQ as the main input, and all EQ bands are adjustable for 15 dB of boost or cut. The Eurodesk's microphone preamps are servo-balanced with the inputs on Neutrik gold-plated XLR connectors and phantom power switchable in banks of eight channels. Dual LEDs help you meter the signal at the main channel path — green for signal present and red to indicate peaking.

The MX 8000 gives you six aux sends and six stereo returns, each with a master level pot (up to 15 dB of gain) and solo capability. They are switchable in pairs from pre- to postfader, and although sends one and two are always derived from the main channel, the remaining sends can receive signal from either the main or the B channel path. Returns one and two have the same push-button assignment as the

**FIRST LOOK:
BEHRINGER'S NEW
MIXER MAKES
PROJECT STUDIO
OWNERS SIT UP AND
TAKE NOTICE
BY STEVE LA CERRA**

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BIG provides the audio quality and standards which made AMEK world famous. Superb equalization, dual path modules, multiple aux and output buses and stereo inputs with MS decoding provide an incredible combination of facilities.

The 28-input version provides 56 mono and 4 stereo inputs with 4 stereo FX returns, the 44-input version provides 88 mono inputs and 4 stereo inputs with 4 stereo FX returns.

AMEK SUPERTRUE

The world standard in console automation. Running on a 486-based PC, SUPERTRUE captures and replays faders, mutes, solos and automated switches to 1/4-frame accuracy - ideal for music recording, video and audio post and broadcast production.

Superb timecode-based off-line editing facilities include the Cue List, which can trigger both console and external MIDI Events, and the Mix Processor, which includes Repeat, Merge, Shift, Erase, Trim, Swap and Copy operations on mix data.

AMEK RECALL

Stores the positions of non-automated knobs and switches - up to 10 console surfaces can be stored in each Title. Selective recall and auto-scan provide rapid identification of only those controls you wish to reset. Graphic displays and AMEK's unique talking Voice Prompt guide you rapidly through the Recall operation.

AMEK VIRTUAL DYNAMICS

VIRTUAL DYNAMICS provides powerful and extremely flexible gain control on each channel. One from a choice of nine devices can be selected - 3 compressor, including a dual-slope compressor with expander; 3 gates, including the Supergate with hysteresis and peak hold functions; Limiter, Expander and Autopanner. Screen graphics present each virtual device as a familiar piece of rack-mount hardware, but the controls are operated with the trackerball and settings are saved - and automatically reloaded - with the mix.

AMEK VFX (Visual Effects)

This incredible new programme will be released in SUPERTRUE during 1995. Outboard effects devices by many of the most famous manufacturers - such as Eventide, Lexicon, Roland and TC - can be controlled directly from the console via MIDI. AMEK's graphics templates simplify operation by presenting multi-level menus in the form of knobs and switches, allowing instant access to all programmable parameters.

AMEK MMC

MIDI Machine Control is now implemented within SUPERTRUE and allows operation of popular recorders such as ALESIS A-DAT and TASCAM DA-88 with many sophisticated locator facilities such as auto drop-in/out, pre- and post-roll and multiple locate points.

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CONSOLE 1996

main channels, allowing effects to be bussed to tape with the flick of a switch. Returns three and four can be assigned to either of two headphone mixes or the main mix, and returns five and six are permanently assigned to the L/R mix. Keeping in mind that you might use sends one and two for your headphone cue, Behringer has made the built-in talkback mic assignable to those sends, the groups outputs, and the studio/headphone feed.

The monitor section of the MX 8000 lets you choose to hear the main mix, the B-Mix, a 2-track tape return, or an external input such as a CD player. And Behringer has thoughtfully included a sum switch for checking these sources in mono. Behringer also offers the optional MB 8000 24-channel meter bridge and a 32-channel VCA fader/mute automation package known as Cybermix CX 8000 (intended to run on a PC).

Keeping in mind that you might some day need to expand your studio setup, Behringer has provided a universal expander port which allows the MX 8000 to link to another console. The MX 8000 is expected to be available in the beginning of March and retail at a price of \$2795 (introductory U.S. list price).

For more information, contact Samson Technologies at PO Box 9031, Syosset, NY 11791. Tel: 516-364-2244. Circle EQ free lit. #122.

ORAM 8/16 CONSOLE

John Oram, the acclaimed "Father of British EQ," has designed and introduced a truly professional analog 8-bus recording console. Mr. Oram, known for the sonic excellence of his audio designs found in VOX, Trident, and MTA consoles, has designed a board to fill the gap between low-budget 8-bus boards and seriously high-priced classic consoles.

This desk, available in 16- (\$9995), 24- (\$13,995), and 32-input (\$17,995) options, features individual channel modules, all with direct outs, inserts, phantom power, and phase reverse. Each module uses surface mount technology (SFM) and contains metering via an eight-segment LED. The preamp circuitry is built around the SSM2017, which achieves an E.I.N. of -127.8 dBu. The super low-noise electronics feature the OramSonics EQ, which trace their roots back to the classic Trident consoles. Bass and treble are shelving circuits with a 15 dB boost/cut. The extensive swept midrange, 100 Hz to 10 kHz, also provides a similar 30 dB range. OramSonics also includes a variable low cut from 5 Hz to 200 Hz.

The OramSonic properties remain in circuit at all times. A bit different



design philosophy, but John Oram plans to ensure that the Series 8 has many different module options in its life span. The next range of modules will have different features, all interchangeable into the same frame. Oram has done this in similar fashion before, and some of the various versions of I/O modules that he did with the Trident Fleximix in 1974 and later with the Trimix are prized today. The current 8 Series version has already found a home with professionals such as musician John Cale.

The in-line modules contain both 100 mm main faders and 60 mm monitor faders, seven aux sends, a fully outfitted master section

with six-way monitor source select, dual-output headphone amp, two-way intercom circuit, peak LEDs, subwoofer level, mono level, aux returns, and eight long-throw sub masters. An optional meter bridge is available at \$1995, as are a VUMORE option, \$795; overbridge stand, \$495; and very cool looking optional 10 mm aluminum knobs, starting at \$645 for the 16-input board. It's very possible that the father of British EQ has designed the mother of all 8-bus consoles.

Oram consoles are distributed in North America by TGI North America, Inc., 300 Gage Avenue, Unit #1, Kitchener, Ontario, CANADA N2M 2C8. Tel: 519-745-1158. Circle EQ free lit. #123.

**FIRST LOOK: JOHN ORAM
BEGINS HIS U.S. INVASION
BY BENNET SPIELVOGEL**

CONSOLE 1996

SOUNDTRACS DIGITRACS

Just when you thought the whole business of affordable digital mixing had been sorted out by the arrival of the Yamaha 02R, Soundtracs has thrown us a curve ball and mixed it all up a bit. In truth, comparisons between the Digitracs, Soundtracs' new digital desk, and the 02R are difficult, particularly in terms of cost, as the Digitracs will come in at around £15,000 UK pounds (approximately \$23,000) when it hits the streets this summer, but it's likely to cause a lot of people to look even harder at the possibilities of digital desk control.

Soundtracs sees Digitracs as the step between the 02R and the silly-money digital desks, and while its appeal

The simplest way to think of the desk is as a 32x8, which is how it will be presented when it comes out of the box. However, all the connectors on the back of the converters' rack can be reconfigured to make the desk work with larger multitrack setups or in different types of applications. The software setup aspect of Digitracs bestows flexibility on the console, which is more akin to super-league digidesks and is one of the real benefits of going digital on a board.

Each of the full-featured inputs has access to eight auxes, four fully parametric EQ bands, and two dynamic effects sections. Automation is total and fully dynamic, employing touch-sensitive moving faders, and is supplemented by snapshots. It syncs to SMPTE and MTC and offers MMC and Sony 9-pin control through a set of transport buttons. The control surface provides hard control sections for such things as inputs and routing, the EQ, the dynamics setting, auxes, and pan to which inputs are assigned for control.

There are an awful lot of knobs and buttons on the surface and multiple surfaces can be bolted together to give more immediate control on 32 faders. Controlling the desk from the basic 8-fader panel involves scrolling input channels across the 8 faders.

Digitracs is quite remarkable, especially as a first attempt at a digital console. The prototype I dealt with was passing audio quite happily and doing all that was asked of it. The ergonomics are excellent and the overall impression is that of an advanced and far-sighted approach to the business of a digital desk. And all this from an independent and relatively small British manufacturer. It's hard not to be impressed. This is a very significant achievement. You will be seeing more on this console in these pages soon.

Soundtracs is exclusively distributed in the U.S. by Samson Technologies Corp., P.O. Box 9031, Syosset, NY 11791-9031. Tel: 516-364-2244. Circle EQ free lit. #124.

FIRST LOOK: SOUNDTRACS' FIRST DIGITAL BOARD PACKS A LOT OF SURPRISES BY ZENON SCHOEPE

will endear it to commercial studios and postproduction facilities, it remains widely applicable to project studios. Soundtracs will only be shipping one version of the product, although different incarnations of the technology involved are extremely likely.

The components of the system are a large rack of A/D and D/A converters, the assignable work/control surface, which also contains all the digital processing and is connected to the converter rack optically, and a monitor screen that reflects changes to desk controls and helps the visualization of what is happening. In terms of I/O capacity, you're presented with 32 mic/line inputs, 8 group outputs, 8 aux outputs, 16 direct outputs, and an additional 16 basic inputs that can be used as 8 stereo effects returns or as monitor returns. Furthermore, 16 channels of ADAT I/O can be plugged up digitally with full processing on the inputs. DA-88 interfaces will follow.

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SOUNDCRAFT GHOST



We all know that the affordable, 8-bus desk sector is among the busiest and most dynamic, and that the name Mackie has become synonymous with that sector. In addition, few will have missed the fact that it is an area in which console giant Soundcraft does not have a recent contender. This situation, however, is likely to change dramatically with the advent of Soundcraft's new Ghost console.

Even a casual look down the channel strip and 'round the back reveals that this is a desk aiming to take on Mackie. More interesting is the fact that Ghost will be available in a moving-fader automated version this summer (at a higher price, of course) — a move that should be regarded as an extension of the Ghost's abilities, which fly high in the advanced-features stakes.

Unique in its class, it offers a row of transport keys for MIDI Machine Control, a dial for scrubbing tape, as well as track-arming, locate and cycle keys. It has a built-in timecode reader/generator, allowing for automated recall of the

128 on-board (channel and monitor) mute scenes. Mute scenes can also be triggered by external patch change command. MIDI gets fancier still as four of the eight group faders can be switched to generate MIDI continuous controller data for tweaking your on-board or synths in real time. That's an impressive package.

The Ghost comes in 16-, 24- and 32-channel versions, with a 24-channel expander option. It has on-board group and stereo L-R metering, but also can be fitted with an input-channel metering bridge. Further similarities to the Mackie include the use of the term "Mix B" for the monitor path in the input strip. The console design is in-line, allowing both signal paths to be routed to the stereo mix for double the number of inputs at remix. There are also four stereo, fully-routable effects returns.

Ghost is advanced where EQ and auxes are concerned. For starters, you get a 4-band equalizer with fixed LF- and HF-shelves (switchable into the Mix B path), plus two (that's right, two) fully parametric mids. There are ten auxes, configured as six mono and two stereo, which may be split between the channel strip's two signal paths — although the Mix B level and pan pot can be switched to act as an additional stereo send for the channel. The master section supports two independent sets of studio outputs, an oscillator, talkback, and the usual control room facilities.

continued on page 129

**FIRST LOOK:
SOUNDCRAFT ENTERS
THE 8-BUS ARENA
BY ZENON SCHOEPE**

IN BRIEF

Allen & Heath's eight subgroup-based console is the GL3000. It's a dual-function board that can be used for FOH or monitoring applications, and is available in 16-, 24-, 32-, and 40-channel configurations. Look for a review on this console in an upcoming issue. (Allen & Heath; Tel: 801-568-7660)...Bruce Springsteen has recently joined the ranks of **Euphonix** console owners. His latest album was recorded and mixed on a Euphonix CS200D in his own project studio, Thrill Hill. (Euphonix; Tel: 415-846-1121)...The **GML Moving Fader Automation System** (Tel: 818-781-1022) is now shipping with the new Macintosh Interface...If you've got a Mackie 8•bus console, a company called **Argosy** (Tel: 800-315-0878) offers a frame named Nevis designed to fit the Mackie 24•8 and the 32•8...**Crest Audio's** Century Vx console is a mid-priced, live performance mixing console with eight audio groups and eight VCA groups. Stay tuned. We'll have a review on this in the near future. (Crest Audio; Tel: 201-909-8700)...**Tactile Technology's** (Tel: 310-802-1500) new M4000 mk. III automated console is now shipping. New software features include merging between different mix passes, which can be performed between two SMPTE time-code points as opposed to using the entire set of fader moves...If you are interested in an automation package that is Mac-based, check out **Audimation's Audiomate**. (Tel: 508-881-7808). Features include five main operational modes, global and channel mode selection, variable auto glide, linked grouping, virtual mutes, auto archiving, and more...Create some magic with **D&R's** Merlin console, which offers ARM (Advanced Routing Multiplex). ARM allows the group busses to be accessed by the mix, channel, and aux 11/12 paths either individually or simultaneously in three blocks of 8 routing busses (D&R; Tel: 903-485-2344).

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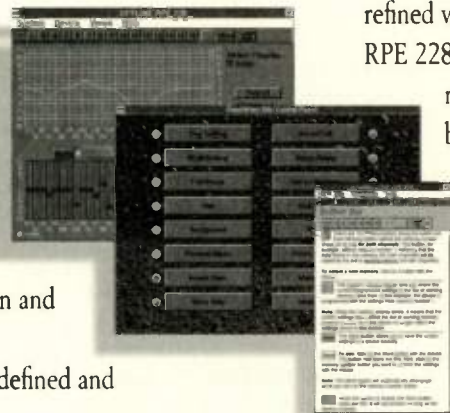


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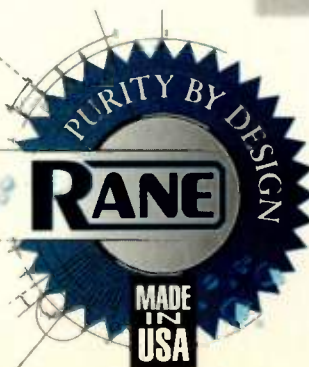


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P U R I T Y B Y D E S I G N

CONSOLE 1996

AMEK REMBRANDT

Acme Recording has the only Amek Rembrandt (40-input) console in the country. I am chief engineer at ACME recording in Chicago, IL. We primarily record private bands and indie label projects. And we have used the Rembrandt extensively, so I have a good handle on what it can do.

I got the Rembrandt because we already had a relationship with Amek; the console we owned prior to Rembrandt was the Amek 3000. A lot of the projects we do here are long-term projects, meaning that there will be a session on one day, and then the artist(s) will come back a week later to complete the session. As a result, we needed a board with recall, and every knob and switch on Rembrandt's surface can be recalled using the SUPERTRUE automation.

The Rembrandt is an extremely quiet and very clean, transparent-sounding console. It's like an 80-input split console in an in-line format because this desk has got two totally separate input channels per module each with its own 4-band EQ. SUPERTRUE automation also offers Amek's Virtual Dynamics on all 40 channels, which can be switched between channel and monitor faders. Virtual Dynamics allows the console to use the VCAs in the fader path as a compressor, gate, limiter, expander, or autopanner. It's really nice to use Virtual Dynamics' processing because you don't have to patch into an insert point and put another 30-40 feet of cable and a bunch of connectors in. This really keeps noise and distortion to a minimum.

The Virtual Dynamics settings can be stored with the song Title automation data, which means you don't have to log all of your outboard dynamics settings or try to reset them. They get recalled with the song data if you have to remix or retrack.



Virtual Dynamics gives a video display of compressor or gate knobs, and adjustments are made by using the trackball; a feature that is very user-friendly. Threshold, attack, release, and hold can be adjusted by way of the trackball, and you feel as if you're operating a real gate.

There is a cool setting called Dual Compressor that allows users to set two different thresholds with two different compression ratios. For example, you might set a threshold of 0 dB to coincide with a compression ratio of 2:1, then at +4 dB a compression of 6:1. This is a great alternative to using two outboard compressors. Another feature, called Autopanner will pan between two faders (that are side by side) when you've patched a signal into their inputs. Then you assign a waveform to modulate the two channels in opposite directions. You can vary the waveform from square wave to sawtooth, adjust the pan's speed, and what triggers it.

Rembrandt has 16 auxiliary sends, which is very unusual and also very nice. We've got a t.c. electronics M5000, two Lexicon PCM-70's, a Lexicon PCM-60, Yamaha REV7, two Yamaha SPX90's, an Ensoniq DP4, MXR delays, an Echoplex III reverb, and a BX20 spring reverb. The auxes on Rembrandt can comfortably handle all of these.

Using Amek's cue list in SUPERTRUE, I can develop a SMPTE cue list that fires out MIDI program changes to all of my outboard gear.

Amek is currently working on Visual FX software to perform actual parameter changes by the computer. They are working in conjunction with Lexicon, t.c. electronics, Yamaha, Alesis, and a few other companies to implement all MIDI controller change information.

Rembrandt has an independent 4-band EQ for the channel and monitor sections. Essentially, this doubles the amount of usable inputs to 80 during mixdown, each with its own EQ. During tracking, engineers can adjust EQ without affecting the signal going to tape or having to split the equalizer.

Rembrandt's mic preamps are of a discrete-transistor design, where there are ten transistors at the front end of the mic preamp. It's sort of a vintage sound in a modern design. This has a warmth and character, but also yields a very clean and quiet sound, as well as tons of headroom.

O SOLO MIO

Rembrandt has two solo systems: the console-operated system and the SUPERTRUE-operated system. The console-controlled system provides PFL and AFL. It's got totally nondestructive AFL and PFL functions that can be used at any time without muting the operation of other signal paths. The AFL bus is a stereo bus, too. Then there is the SUPERTRUE-operated solo system that provides SIP (Solo-In-Place) operations and Solo Defeat configurations. This section is destructive

continued on page 122

**FIRST LOOK: THE FIRST
REMBRANDT HITS THE U.S.**

BY PAUL SMITH



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MACKIE ULTRAMIX AUTOMATION

Mackie's Ultramix automation system has been more anticipated than the second coming of Elvis. The company has been promising an affordable system that is powerful, easy to use, and won't require a NASA tech to operate. Well, Mackie has finally delivered Ultramix and you won't be disappointed. Among other things, Ultramix gives you fader and mute automation for up to 130 channels, playback of standard MIDI files, color-coded grouping of channels, and on-screen metering of input levels.

The Ultramix system consists of three items: Ultramix Pro software, the Ultra 34 (two-rack space) patchbay, and the Ultrapilot fader pack. You provide the recording console, Macintosh computer (Ultramix Pro for Windows is under development), and MIDI interface. Ultra 34 contains the VCAs; connecting to your console simply requires a set of 1/4-inch TRS-to-TRS cables that patch Ultra 34 to your inserts. Ultra 34 is actually a half-normalled *balanced* patchbay, so you can also patch it between the tape machine outputs and console tape return inputs without converting to unbalanced lines. Ultra 34's MIDI in and MIDI out ports plug into your MIDI interface.

Since you have "used" your console inserts, Ultra 34's front panel provides inserts for 32 channels (plus the left and right masters) on separate 1/4-inch TRS jacks for send and return. Studios with TT patchbays will find they need a bunch of 1/4-inch TRS-to-TT patch cables to use said inserts, but Mackie made the best of a touchy situ-

tains power and MIDI indicators and a bypass switch that routes the audio through the VCAs at unity gain.

TAKE ME TO THE PILOT

Ultrapilot is the user interface, containing 16 faders and a series of "soft" buttons that are capable of doing anything from making a channel record-ready to accessing autolocate points. It might have been nice for Ultrapilot to contain 32 faders, but that would undoubtedly have raised the price [and also make it *unwieldy, according to Mackie*. —Ed.]. Since we're used to



ation punch: making Ultra 34 with TT connectors would undoubtedly raise the cost and discourage users with 1/4-inch bays. The front panel also con-

punching in and out of record on tape machines, Ultrapilot's soft buttons require some getting used to. Ultrapilot connects to Ultra 34 by what appears to be the biggest telephone connector ever made. Mackie now includes a 25-foot cable that allows you to put Ultrapilot just about wherever you want.

Ultramix Pro gives you two hard-disk authorizations on the master disk. If you double-click on the install icon, you will be prompted through the installation process. Ultramix supports FMS and OMS. The "standard" process will install OMS (Open Music System), which Mackie has included. If you already use OMS, you can do a "custom" install without OMS. Note: if you install Ultramix with OMS and already have OMS, there is a possibility of erasing your existing OMS studio setup. After the install you must con-



MANUFACTURER: Mackie Designs, Inc., 16220 Wood-Red Road, Woodinville, WA 98072. Tel: 206-487-4333.

APPLICATIONS: VCA fader and mute automation for recording studio mixdown.

SUMMARY: A well-designed, reasonably priced automation system that offers most of the features of more expensive automation packages. Macintosh-based (PC release is imminent).

STRENGTHS: Easy to use; expandable up to 130 channels.

WEAKNESSES: Documentation is somewhat incomplete; initial setup procedure might scare non-MIDLots.

PRICE: Complete system including Ultramix Pro, Ultra 34, and Ultrapilot: \$2797; additional Ultra 34 units: \$1799

EQ FREE LIT. #: 125

CONSOLE 1996

figure an OMS studio setup — probably the most scary aspect of using Ultramix, but fortunately it only needs to be done at initial setup and the manual prompts you through it. After that Ultramix will communicate with OMS in the background and let each other know what is happening MIDI-wise in the system. If you need to know more about OMS, read the OMS manual that Mackie includes.

GETTING STARTED

After setup and install, we were ready to start using the system. The Ultramix owner's manual was helpful to a certain point but is somewhat incomplete. Mackie does a good job of walking you through the OMS part, but there are obvious omissions such as keyboard shortcuts (which are included on a single-page cheat sheet). And we felt that coverage of the Event Editor was geared more towards users already familiar with event list editing

from MIDI sequencing programs. While the manual mentions "selecting" faders they don't tell you that a green arrow will light over the fader number when the channel has been selected. The good news is that Mackie has started shipping the very useful Ultramix Studio Companion with the system and is currently working on more complete documentation.

When you boot Ultramix, you will see a new session screen with 32 faders (which can be named by calling up the fader list from the Fader menu), transport controls, timecode window, locate registers, and mode control buttons. If you'd like to see 16 larger or 32 smaller faders, you can optionally select a 2x or a 0.5x view. Ultramix can display up to 128 faders. If your multitrack can read MMC, you can play your multitrack tape machine from three places: the on-screen play button, the Ultrapilot, or by pressing the space bar on your keyboard.

Assuming OMS is correctly configured, the timecode display window will start running and sync to the timecode of your source. Keep in mind that the Ultramix locate window is showing MTC and will not agree with an autolocator showing relative time from the song start.

There are two basic ways to work Ultramix. The first is to set the console faders to unity gain and then do your mix entirely from Ultrapilot. This method has a high repeatability factor and provides good headroom and signal-to-noise ratio, but requires you to record fader positions for every channel of audio whether or not there will be fader moves. The other way is to do a conventional mix on your console with all Ultramix faders at unity (or a gain setting of 98) and then only automate the channels you wish to make moves on.

Ultramix's main session screen shows two different faders: the white or "solid"

continued on page 120

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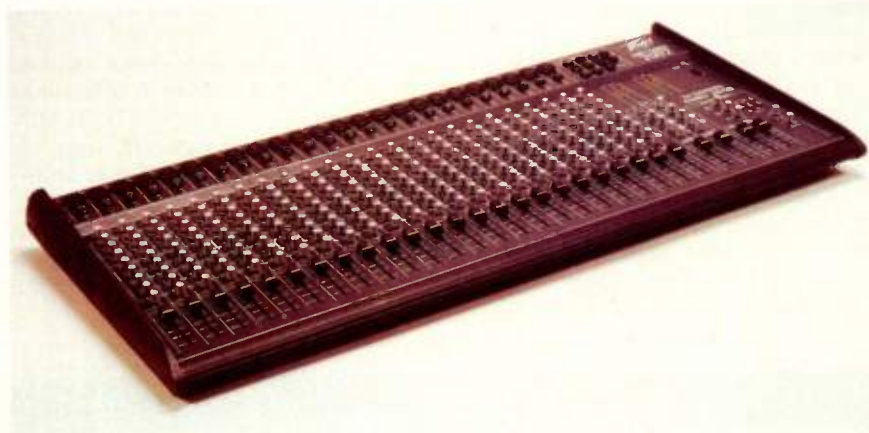
PEAVEY UNITY 2002 LIVE MIXER

The Peavey Unity 2002 live mixer represents the price point at which Peavey starts to get serious about consoles. It's a very uncomplicated board, but then you're not being asked to part with a fortune for a desk that comes in 12-, 16- and 24-channel versions. Construction is of the single-plate-face-type, extending up to the connectors in a package that is remarkably light, compact, and almost comfortable to carry under an arm — something you can't say about most 24-channel boards. The power supply is integral and phantom power for the mics is switched globally. Channels have mic and unbalanced line inputs with line connections taking priority if both are plugged in.

READY TO GO

Everything is incredibly clear on the features side. The 2002 is the sort of desk that anybody can use. Inputs pass through a gain pot and on to a 3-band fixed EQ offering ± 15 dB on 12 kHz and 80 Hz shelves and a peaking 750 Hz mid. You then run into the aux section with two prefade, post-EQ monitor sends and two postfader effects sends. The effects auxes have master pots, but the monitor feeds run to separate outputs on faders in a dedicated foldback section. The 2002 also has two stereo effects returns, and these can be mixed separately into the two monitor feeds as well as being returned to the main mix output.

Channels are completed by 60 mm faders and a peak LED. Metering is provided for the two monitor outputs and the main mix output. Two pairs of RCA jacks permit a 2-track to be played back into each of the two monitor busses and the main mix, all on indi-



vidual pots, and for the prefade main stereo mix signal to be recorded with its output level controlled from a pot. A nice and loud headphones circuit with volume completes the picture.

IMPRESSION

The 2002 reminds me of the sort of desks I first got to grips with (not so very long ago...). Yes, it is basic, but that's one of its strengths and you can easily do a live show on it. It's scaled just about right with two stereo returns, although you could also use the tape

inputs as an extra stereo input. The monitor section is very useful and often neglected on this type of desk. Being able to run a couple of wedges to the band on a small rig complete with effects and even a tape feed for cues and clicks can make all the difference.

However, the lack of any means of being able to monitor for yourself what the band is hearing makes the process a little more hit and miss. Indeed, aside from power and phantom there are no switches on this

board, which indicates that the arrangement is very fixed. The greatest omission is channel cuts — but then we are talking budget here. Although it's not the quietest board in the world, fader shut down is really excellent. The fader laws are a little peculiar as they really fall to nothing rapidly at the bottom of their travel and all the useful working level control is concentrated into the top third of the track.

EQ is satisfactory, but some may find the HF strident for what is already quite a bright-sounding desk and is better reserved for cutting rather than adding. Mid EQ is fine, and the LF does a good job of adding meat. The channel peak LEDs are a bit odd in that they read after the fader as well as after the EQ, but I'm nit-picking on what is a very affordable and fundamentally very competent board. The Unity 2002 is dead easy to use, fast to get results on, and sounds just fine. For its size, the 24-channel version really takes some beating as far as input density goes. I only wish the boards I started off using were this good. Neat.

—Zenon Schoepe



MANUFACTURER: Peavey Electronics Corporation, 711 A Street, Meridian, MS 39301. Tel: 601-483-5365.

APPLICATION: Live sound.

SUMMARY: Straightforward stereo mixer with 3-band fixed EQ, stereo effects returns, two auxes, and two dedicated monitor outputs.

STRENGTHS: Child's play to use; monitor features useful; inexpensive; compact; high density of inputs for size.

WEAKNESSES: A bit basic and fixed in configuration, but think of the price...

PRICE: \$899.99 (24-channel version as reviewed; 12-channel, \$599.99; 16-channel, \$749.99)

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SPIRIT LIVE 8



MANUFACTURER: Spirit (Manufactured by Soundcraft in the UK). Distributed by Spirit By Soundcraft, Inc., 11820 Kemper Road, Auburn, CA 95603. Tel: 916-888-0488.

APPLICATION: Live sound mixing

SUMMARY: Eight-group live console available in variety of mono channel sizes with two stereo input strips, a 10 x 2 matrix, four mute groups, and eight additional stereo inputs.

STRENGTHS: Class leading value for money, flexibility, and input density; excellent pre-amps; good sonic performance; very compact.

WEAKNESSES: None for the money.

PRICE: \$6399.95 for 32-channel version reviewed (also available in 16-, 24-, and 40-mic input versions; \$4299.95, \$5299.95, and \$8299.95, respectively)

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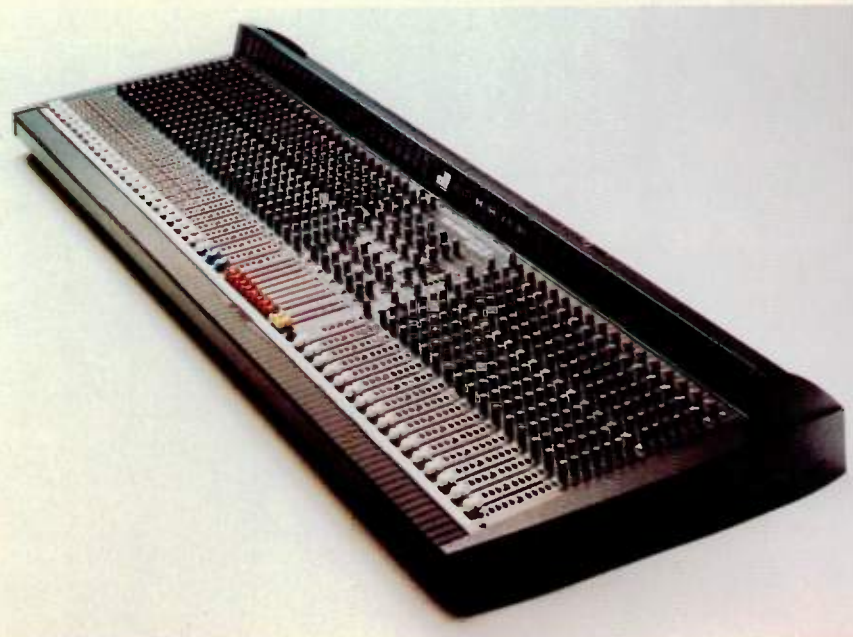
The Spirit 8 is a response to the number of Spirit studio consoles that have found their way into live use and builds on the interest that the company has been expressing in this area.

It's a quality bit of gear, extremely compact — an easy two-person lift — that uses an integral meter bridge, which monitors inputs and group and main stereo outputs and also acts as a torsion brace across the chassis. The Live 8 comes in 16, 24, 32 and 40 mono-channel (actual mic inputs)

frames, and while it is primarily aimed at live work, multitrack recording is accommodated by direct outs on mono channels.

XLR and 1/4-inch inputs are balanced, while stereo inputs are on individual left and right balanced jacks. The mix, group, and matrix outputs are on XLRs, and the groups and the main mix (as well as channels) have inserts. There's also a balanced stereo record output.

Spirit 8 uses the Ultramic Plus padless mic amp, which can also handle line inputs to a maximum of 28



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dBu, and with 66 dB of gain you can throw just about anything at it. It's a development of the original Ultramic introduced on the PowerStation and is claimed to be even better. Mic and line inputs are switched on the connectors, and there's phase reverse and individually switched phantom power.

Mono channels have a switchable 100 Hz, 18 dB/octave HPF (high-pass filter) followed by ± 15 dB shelving LF and HF at 60 Hz and 13 kHz, respectively, and sweepable, fairly broadband mids covering 80 Hz–1.9 kHz and 550 Hz–13 kHz.

There are six auxes: 1 and 2 are prefader; 3 and 4 can be switched pre/post globally; and 5 and 6 are postfader. Pre auxes can be internally jumpered to give pre-EQ sourcing.

Routing to the eight groups and the main mix is achieved via paired group switches and a pan pot. It's here that you also find the four mute master groups that are stored and selected

in the master section. The desk employs Spirit's combined PFL and peak-indicator LED.

Stereo strips have a basic stereo input routed to the main mix (for things like pre-concert playback) and a more fully featured stereo pair. The former has access to auxes 1 and 2, $-10/-20$ dB switchable gain, a PFL, and a level pot. Full stereo inputs have 22 dB of gain, access to all auxes in mono, full routing via a balance pot, PFL, and mute master group participation. EQ is restricted to HF and LF switchable between 6/12 kHz and 60/120 Hz, respectively, with an EQ bypass.

Group strips house two group faders, yet another two stereo returns, and two pots and a PFL for each group's contribution to the two matrix outputs. Pairs of groups can also be switched to mono and routed to the main mix. One set of stereo returns has fixed HF and LF EQ and each pair can be switched between the main mix and the two groups beneath it.

The main mix can be routed in mono or stereo to the matrix and the arrangement is completed by two matrix master output pots with AFLs. Talkback can be routed to auxes 1 and 2, 3 and 4, the main mix, and the groups.

It's extremely hard to fault the Spirit 8, especially for the price. It sounds great, has excellent crosstalk and mute performance, and there is no doubt that the input front end is very refined.

A matrix on such a board may seem a bit ambitious, but it's big enough to handle extra speaker feeds or to serve as an adjunct to the aux capability. It adds up to a remarkably flexible desk with a high density of inputs and a fair smattering of EQ. It's an outstanding value for the money.

Individuals or sound companies looking to do live work with a bit of recording as a side line will understand that the Spirit Live 8 has to be one of their first ports of call.

—Zenon Schoepe

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DDA CS3 MIXER

Although many mixers are available to suit the basic needs of live sound and recording, there is a gap in mixers that can meet the more specific requirements of some live sound applications. DDA has created the CS3 to meet the needs of the cost-conscious buyer who wants to achieve more sophisticated control over signal routing.

The CS3 is a 4-bus console that is distinct for its ability to assign inputs to any group or pair of groups individually and also provide both left-right panning and left-center-right (L-C-R) panning to the master outputs. The console includes fully parametric mid-band EQ on every channel, plus fixed 12 kHz and 50 Hz shelving EQ and an 80 Hz high-pass filter. These are two feature sets that are usually available only in consoles costing 3 to 10 times the price of the CS3. Add to this a well-built chassis and colorful layout of controls, and you have a very good value for the regional theater, club system, or amplified church service. (DDA says that based on extensive customer input, a sweepable parametric equalizer for the CS3, from 150 Hz to 10 kHz, will be available soon. —Ed.)

PANNING THE GLOBE

Why would you want to have L-C-R panning or individual group assignment? These are features that can best be appreciated by those who have

worked with sound systems featuring a central loudspeaker cluster (in addition to left and right loudspeakers) or anyone that operates a mixer for live theater. When sound systems use central clusters that match the sound qualities of their left and right loudspeakers, then a L-C-R pan control

due to the path length between the left/right loudspeaker. Suddenly you can pan sounds across the room and they don't seem to disappear into a hole or hop across the center of the stage.

When you use the CS3 for recording or with a sound-reinforcement system that has only left and right loudspeakers, a switch (individually set on each input) returns the panning



offers enhanced sound localization for the entire audience. No longer do the vocals (usually panned center) suffer from the interference in many seats

to the normal left/right mode and another switch can sum the left/right master signals to the mono master for use as a separate feed to the lobby or backstage. Panning can be enabled to the groups on each input channel to allow odd/even panning, and this is not affected by the master L/R or L-C-R panning switch.

The DDA CS3 shows attention to the details required to match the pace of live sound. A mute switch (labeled "Cut") is placed away from other switches to prevent accidents. The PFL and AFL buttons are below the faders where they can be quickly accessed. The Peak and Signal Present LED indicators are also below the faders — where they easily catch the eye.

The CS3's output AFL (solo) buttons are defeated whenever an input PFL button is depressed — a feature introduced on high-end consoles. This



MANUFACTURER: DDA, Unit 1, Inwood Business Park, Whitton Road, Hounslow, Middlesex, TW3 2EB England. Distributed in the U.S. by Mark IV Pro Audio Group, 448 Post Road, Buchanan, MI, 49107. Tel: 616-695-4750.

APPLICATIONS: Live sound mixing for theater productions or music, but also offers 4-bus recording capability.

SUMMARY: An extremely versatile compact mixer with features that will prove indispensable with on-going use. Extensive internal configuration capability.

STRENGTHS: Fully parametric mid-band EQ; Left-Center-Right panning; individual group assignment; external control interface; well constructed.

WEAKNESSES: EQ doesn't reach into the problematic 150 Hz to 400 Hz region; no EQ bypass switch.

PRICE: \$5200 (for 24-channel version as reviewed); 16-channel, \$3990; 32-channel, \$6420; 40-channel, \$7650

EQ FREE LIT. #: 128

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allows you to have your Aux output or a Group soloed into your headset and then quickly check a microphone without having to first find that Aux or Group and turn off the solo button. An extremely practical feature. There is also the potentially dangerous Solo-In-Place (SIP) mode (with LED indicator) available that solos (PFL) inputs to the master L/R outputs. Handy for the

soundcheck, but check that switch before the show starts!

UNIQUELY COMPACT

The 3-band EQ is powerful and the shelving frequencies (high at 12 kHz and low at 50 Hz) are well chosen for music mixing. The mid-band is a fully parametric filter that sweeps between 500 Hz and 15 kHz and can produce

nice two-octave wide (low Q) ranges for making broad tonal changes. The filter bandwidth can be continuously varied until it produces a 1/3-octave (high Q) notch for eliminating sampler clock noise or a feedback mode. Unfortunately, DDA decided to focus on high frequencies with this EQ section, and it doesn't reach into the low mids and upper bass region that can often be problematic in vocals.

Although, as shipped, only Aux 3 and 4 can be switched pre- or postfader, it would seem that nearly any variation (prefader/premute, postfader/postmute, prefader/postmute, etc.) on routing the six auxiliary sends can be achieved with the 14 internal links on each input circuit board. Group modules include 30 internal links (including some for future 8-bus DDA models) and the L/R and Center circuit boards include another 10 links (for output transformer options).

There is a unique feature on each input for adding simple remote muting control or triggering external effects from the Cut (mute) switch. A latching header connector mounted on the rear-connector panel provides switch closures that could be used to start sound sources, turn on cue lights, or trigger the pyrotechnics! The creative technician could provide an array of control through these three pins on each input. A Littlite connector on the rear panel provides power for the common gooseneck-mounted console lights (not included), but unfortunately uses a female XLR that could be mistaken for a microphone input. Look out! The power for the Littlite could damage a microphone.

The DDA CS3 is a good-sounding, easy-to-operate mixer with sophisticated up-market features. This well-built console will be available with an optional travel case. Handy, because the 24-channel version is compact enough to fit into the back seat of a car. This is a console that could make anyone running theater shows or church pageants very happy. —Wade McGregor

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

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STATUS SYMBOL

Otari's Status console has console-wide image recall. The settings of every fader, knob, and switch can be saved to a built-in floppy drive. Status allows nulling of up to seven controls at one time. Status is available in three frame sizes: 32-, 40-, and 48-input modules. Standard features include meter bridge, floor stand, Image Recall, and Snapshot Automation. For more information, contact Otari, 378 Vintage Park Drive, Foster City, CA 94404. Tel: 415-341-5900. Circle EQ free lit. #129.

X MARKS THE SPOT

The fact that the RSP Technologies' Project X board provides direct connection to ADATs made engineers take notice. Project X is a totally digital console configurable up to 64 x 32 x 2 with 8 aux sends and 8 stereo returns. The dynamic automation includes all of Project X's console functions. Each input channel includes HUSH noise reduction/gating, compression, 4-band parametric EQ, high- and low-pass filters, phase reversal, and up to 42 ms of time delay. For more information, contact RSP Technologies, 2870 Technology Drive, Rochester Hills, MI 48309. Tel: 810-853-3055. Circle EQ free lit. #130.

02 KIND

Yamaha has announced that the 02R digital recording console is now shipping. To refresh your memory, the 02R has 24 analog inputs and 16 digital tape returns for a total of 40 inputs, 8 digital bus outputs, 16 digital direct outputs, and 8 aux sends. Other features include real-time automation with snapshot memory and instant reset of all console parameters. The 02R digitally interfaces with digital sources and recorders using four card slots and interface cards for Alesis ADAT, TASCAM DA-88, RDATE, professional AES/EBU, and Yamaha recording formats. For more information, contact Yamaha, P.O. Box 6600, Buena Park, CA 90622-6600. Tel: 714-522-9011. Circle EQ free lit. #131.

SPECIAL FX

Ensoniq, known for its keyboards, has entered the 8-bus mixer arena. Its 1682-fx mixing board features 16 channels (32 total inputs for mixdown) with input trim, input overload LED, pan/balance, mute, 4 stereo channels with high/low shelving EQ, mic pres channels 1-8, phantom power, solo-in-place, balanced inputs, and CD/phono inputs. For more information, contact Ensoniq, 155 Great Valley Parkway, P.O. Box 3035, Malvern, PA 19355-0735. Tel: 610-647-3930. Circle EQ free lit. #132.

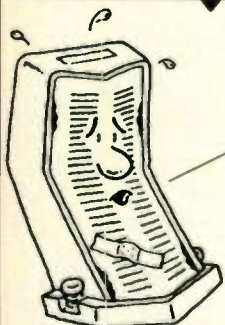
MIX MASTER

Trilog from Studiomaster is a 4-bus console that is available in two standard formats: the rackmountable 166 and the floor-standing 206. The two consoles are further enhanced with the availability of a 10-channel reinforcement expander, along with a 32-input recording expander (320EX). Other features include balanced mic/line inputs, channel direct outputs, and control room and headphone outputs. For more information, contact Studiomaster, 3941 Miraloma Ave., Anaheim, CA 92807. Tel: 714-524-2227. Circle EQ free lit. #133.

THE 8-BUS STOPS HERE

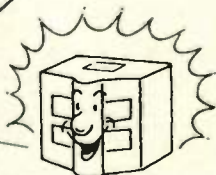
The M2600 MKII, successor to the TASCAM M2600 console, provides all of the original features of the M2600 plus more. The M2600 MKII provides an optional meter bridge, switchable -10 dBv/+4 dBm signal levels for tape in and group/direct outs, increased trim control range, improved EQ, and power supply enhancement. For more information, contact TASCAM, 7733 Telegraph Road, Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #134.

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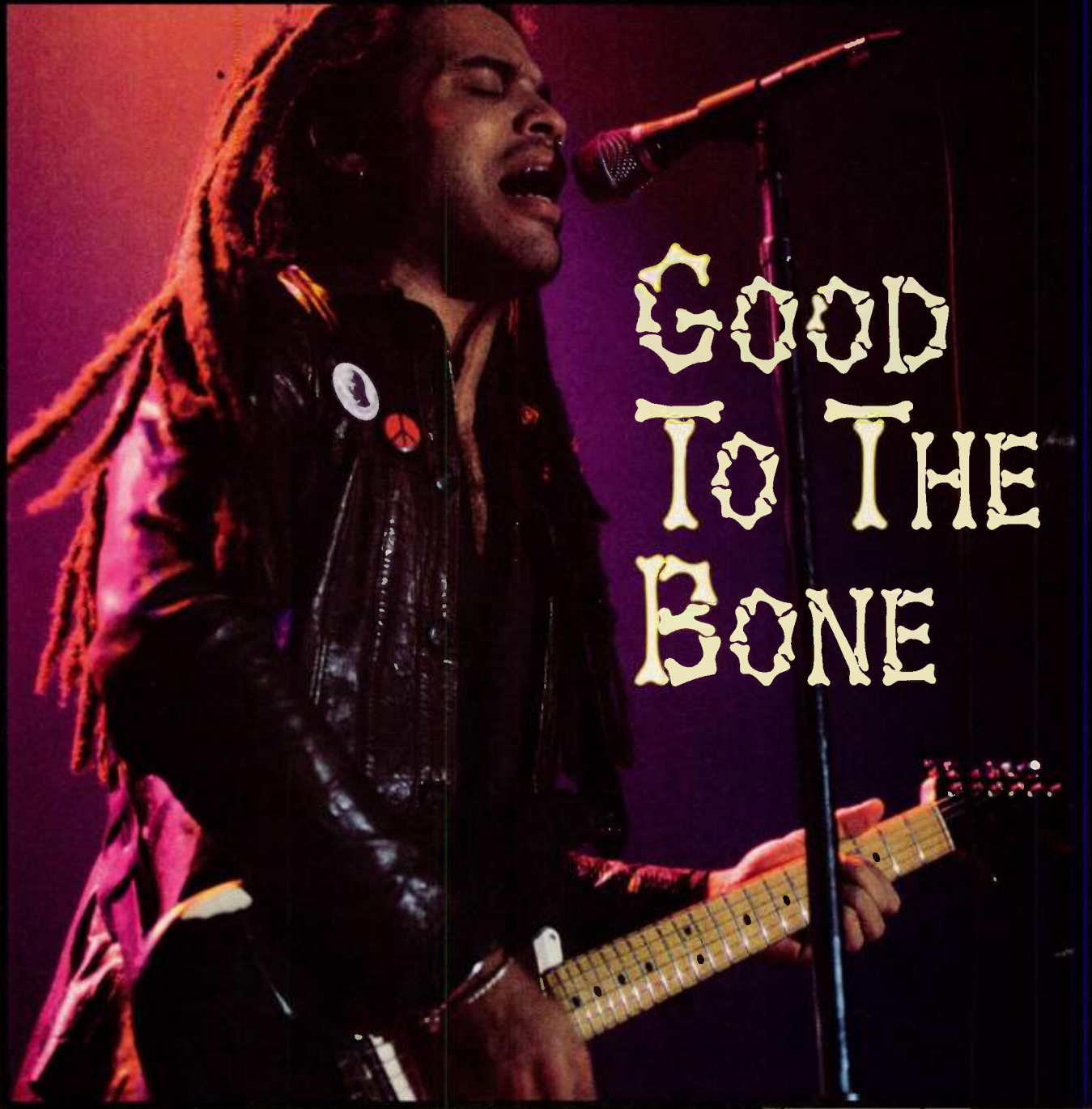
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EQ LIVE

EQ CLUB
SPOTLIGHT
PAGE 98



GOOD TO THE BONE

Photos by Michael Zauser



GOOD TO THE BONE

THE ART OF VINTAGE LIVE MIXING AS DEMONSTRATED BY LENNY KRAVITZ'S CURATOR AND FOH ENGINEER, TOM "BONE" EDMONDS

BY LIANA JONAS

TOM "BONE" EDMONDS is a different breed of cat. He has done live mixing for the likes of Patti Smith and Meatloaf, has recorded the Rolling Stones, and spent much of the 1970s working with his "main" influence, Todd Rundgren.

Currently, Edmonds is the FOH engineer for Lenny Kravitz, who is using all vintage gear on stage. You will find no digital trickery in Edmonds's FOH racks; in fact, most of his processors were not manufactured beyond 1970. Highways of red, green, and yellow LEDs that dazzle some do not impress him. And his unorthodox methods of live mixing have raised a few eyebrows that at first may be raised in doubt, but eventually end up raised in admiration. Call him nuts or call him a radical purist; Tom Edmonds can safely be called unconventional.

SWITCH THE DINOSAURS

Kravitz plays most of his show through four different amplifiers, all of which are vintage — a 50- and 100-watt Marshall and a Fender Super Reverb and Twin. These amps hail from years 1958–1972, and they are not re-issues — they are the bona-fide originals.

To switch between these dinosaurs, Kravitz is using an analog Bradshaw switching system (of guitar-rig guru Bob Bradshaw). His guitar tech off stage has an identical system as well. The duties of switching in between the amps are shared between Kravitz and his tech; whoever is closest to the box will do the switch. The show's entire program schedule is determined during rehearsals, and there is no guesswork involved come showtime. Edmonds does attest, however, that Lenny will throw him a "curveball" once in a while

by switching into an amp that's out-of-program — a challenge that he enjoys.

MIC IN/TAPE IN

Miking for Kravitz's vocals is handled by a Shure SM87. "It gets less leakage from the instruments surrounding Lenny," notes Edmonds. "It's got a better rejection pattern." Eight Sennheiser 409's are used on Kravitz's arsenal of vintage amps; two per amp. They are draped over the amps and are secured flat against them with Velcro. The use of the 409's and the fact that they lay flat on the amps keeps leakage to a minimum.

Four 409's are used on guitarist Craig Ross's rig. They are routed to a splitter that in turn sends the signal to Ross's stage tape delay. Edmonds's use of the 409's eliminates the need for mic stands and keeps things tidy on stage. "The 409 is a little square microphone. One of the two mics [per Kravitz amp] will come to me FOH and give me the clean signal. The second mic goes to a Mackie mixer on stage,

which goes to an analog tape machine. From the tape machine, the signal travels to an amplifier and comes out of a Marshall 4 x 12 cabinet next to Lenny's rig and returns the delayed signal. This tape machine gives Lenny his delay."

If you're wondering whether or not you've read correctly, don't worry, you have. Kravitz and Ross are using tape delays on stage, and they're not coming from a box — the tape delays are coming from real analog tape machines. More interesting is the fact that this method is being used in a live application.

There are two old Studer 1/4-inch tape machines on stage; one for Ross and one for Kravitz. Kravitz's Studer is his sole source of guitar delay. "We're doing things the real way. This is how you'd get delay in the studio, and this is how we're getting it here," says Edmonds. Different tape speeds are selected to achieve certain delay effects. For example, on the song, "Rock and Roll Is Dead," Lenny's guitar solo

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Flexible discrete group bus assignment is rare on compact consoles, but it's here on the CS3. Any signal can be routed to the four groups, L+R or stereo mix buses, and the mono or centre mix bus. A mono signal can be panned or spread across a pair of groups or the stereo mix or, in LCR mode,

between left centre and centre right. There's a full solo-in place (SIP) system for truly flexible signal monitoring.

The master section includes four stereo inputs and four group outputs which can be routed directly to the PA inputs, the multitrack, or bused to the main outputs.

Inputs feature three band equalisation with a fully parametric mid-band, six internally configurable aux sends and a high-quality long-throw fader. Available in 16, 24, 32 and 40 input frame sizes, the semi-modular layout allows you to specify a configuration which meets your needs precisely.

And with DDA's reliability, audio transparency and a 3-Year Warranty, the CS3 is guaranteed to give you the DDA Advantage throughout your future.



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CS3 Features

- ▶ 40 Input Module Frame available
- ▶ Stereo and Left/Centre/Right Panning Modes
- ▶ Individual Routing to Groups



16, 24, 32, 40 Channels

- ▶ Solo In Place Mode in addition to PFL and AFL
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as crunchy as I'd like them to be; maybe someone will read this and make one crunchier!"

LIMITLESS POSSIBILITIES

Getting Edmonds to reveal some of his secret tweaks was not an easy task, as he's very protective of them. He did finally concede and revealed some of his unorthodox ways of applying his limiters. "There are three limiters on Lenny's vocals at all times. And I go from one limiter to the other from song to song. I am changing the gain structure from within the song, and sometimes I use the actual limiters to mix the vocal and not the fader.

"I can open and close his voice, and really squeeze it. I do a lot with limiters because Lenny's voice has such a broad range. He can go from falsetto to blasting loud vocals, and when squeezed properly, I like the way Lenny's voice sounds. I use my dbx 160's, the TLA 100, and a TLA 200. The 100 doesn't have a variable attack and release whereas the 200 does. I've always got my hand on a limiter."

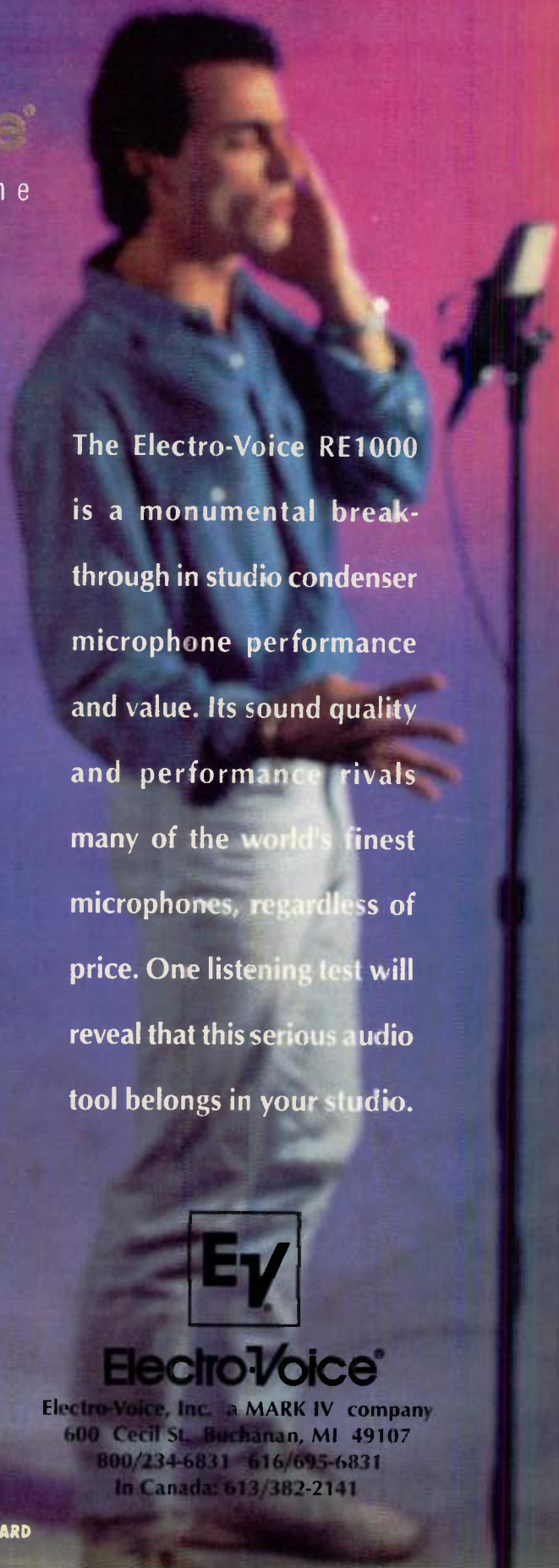
There's good noise and bad noise when it comes to vintage gear advises Edmonds. "Bad noise would be a really bad blatant ground hum coming from the guitar amp or the keyboard rig. Getting all of the rigs grounded together is sometimes difficult; it's just never the same thing with vintage gear. Luckily we have techs that travel around with us to pinpoint where the hum is coming from. Also, the Bradshaw switching system helps to eliminate noise because it is such a quiet, well-made piece. But the gear is temperamental nonetheless."

Edmonds never revealed why his nickname is "Bone." Perhaps it is because most of his gear comes from Bedrock. 

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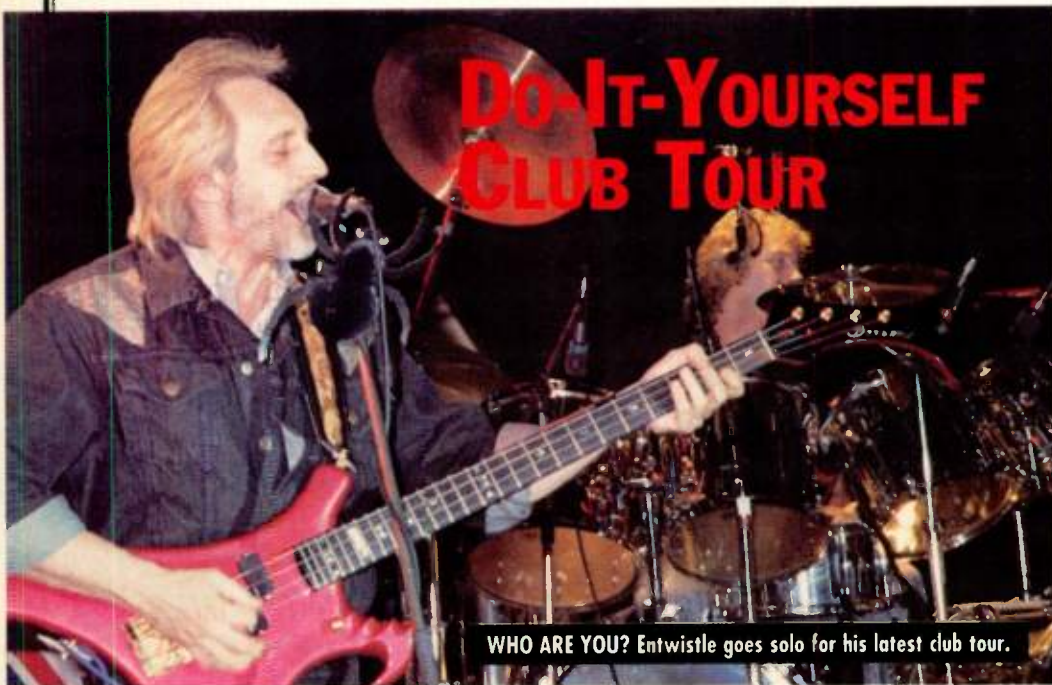


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CIRCLE 33 ON FREE INFO CARD





WHO ARE YOU? Entwistle goes solo for his latest club tour.

LET'S FACE IT: when you've got a legendary band like The Who on your resume, getting a record/tour deal is a lot easier than it is for your average musician. Still, John Entwistle, bass player for The Who, chose to go it alone when it came time to release and promote his new album *The Rock*.

I am John's drummer, tour coordinator, and business partner. He and I have been doing this record since the late 1980s. The reason it's taken this long is that different projects keep popping up — like when John did Ringo Starr's All-Star Tour — and we didn't want to rush this project.

The idea behind *The Rock* is to get the music out to the people who want to hear it — both through the recordings and the live shows. It is a totally fan-based idea. That's why we decided to forego the record

company route and go right to the people. We are making the record a limited edition, with only 5000 copies being printed. Each record will be numbered and have John's original artwork and liner notes. We will be distributing them ourselves, through the live shows.

ROAD TRIP

Our tour started back in January and will go on for about three months. We are playing mostly small theaters and large clubs. A lot of people have been a little nervous to book us because there is not a big record company behind us, but this is where being associated with a rock 'n' roll legend helps the most — it helps soothes a clubowner's nerves

In order to keep costs down, we are not carrying much of our equipment with us. Basically, we're carrying John's monitor system

and backline, and using house production. Of course, there are pros and cons to this approach, but at least you know that the system you are using — good or bad — will be tuned to the room. One thing we are bringing is our own engineers; Steve Eigner on FOH and Dean Nemeth on monitors.

We are doing something very different with this tour — recording direct to hard disk. We're experimenting with it. Some nights we take the FOH mix, some nights we use the monitor mix. We are using Cakewalk software and storing the data on Iomega Jaz or Barracuda drives. Eventually we may bring a bunch of ADATs and feed the tracks into the Cakewalk individually.

We don't exactly know what the recordings will be used for, but Cakewalk's digital format makes it applicable in many places. We've made a Web page (Eden.com/~theox) and we're posting bits of audio and video, and we may release a live album at a later date. Who knows; at least we've got everything stored and ready to go.

GOING SOLO

I think do-it-yourself tours are the wave of the future. Without the record company pulling the strings, it offers artists a lot more creative freedom — and that's good for both the performers and the audience.

For an independent band (those without soldiers from the British invasion) to start their own tour, you need to find someone to support it; a sponsor of some sort. And I'm not talking about your parents. (For this tour, Cakewalk is a major sponsor of ours. Cakewalk is a cutting-edge type of company, and I have been with them for many years, so they were a logical choice. Of course, Cakewalk is not the sole supporter of our tour — we've also got Roland, and a few others.)

Your average band might not be able to go to Cakewalk or Roland and get taken seriously, but could go to a local record store, radio station, or independent label and get a regional tour going. Each band needs a least one member that will devote a lot of time and footwear to go from manufacturer to manufacturer, record store to record store, and so on to find a supporter for the tour. Everybody wants visibility — and that's what the tour will offer them.

If you are a young band without a lot of overhead, it is possible to make some safe deals. It's not easy and it's not guaranteed, but if you've got a hook and some airplay your odds are looking good.

It's a rough world. Change the game — make it work for you.

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EQ CLUB PROFILE: TOAD'S PLACE



Photos by Mary Leonard

FOR CLOSE to 20 years, Toad's Place in New Haven, CT has been a mainstay stop for bands on the East Coast club circuit. Located on the Yale campus (literally), Toad's has played home to a who's who in touring bands including Billy Joel, Peter Dinklage, Little Feat, and the list could go on forever. Since 1989, Mat Diamond of Horizon Sound (Shelton, CT) has been the PA systems engineer at Toad's Place.

If you took a look at the PA system we have here in Toad's Place, you might not think that it was all that special. It is actually a rather old system that we run in mono. There are eight 18-inch woofers in W-bins under the stage and a flown center cluster of eight 15-inch drivers, eight horns, and eight bullet tweeters over the stage.

For power amplification, we use QSC MX1700's on the low end, Crown DC300's on the low-mids, and Yamaha P2200's for all of the highs. The console is a 40-input Yamaha PM1800, which we have found to be enough for just about all of the acts that come in here. Effects at front-of-house include a Roland SDE-1000 delay, Yamaha SPX900, Rev 7 and SPX 90II, two dbx 166's, and six Ashly gates. Not exactly what you might call "state-of-the-art."

But just giving you a list of gear really doesn't say much about the way our PA sounds — and it really does sound good. I think that constant maintenance has been the key to keeping this system happy. The 15-inch drivers were all replaced recently with new ones from Electro-Voice and within the last two years, the 18's were changed to new JBLs (the horns and bullets all use JBL drivers as well). The old 15's had been in use for almost 10 years and they were getting tired, so rather than wait, we changed out the drivers before it became a problem. The system is a

concrete block. It has taken a lot of abuse but it still works great because we are constantly maintaining it.

TAKE IT TO THE LIMIT

On the low end of the system, we have an old dbx 161 compressor that I use to help tighten up the 18's in the W-bins. The rest of the house mix does have a compressor (Ashly CG-85), but if the engineer coming in with the band knows what he is doing, I'll give him a lot of room. I know where the PA is going get pushed, so I'll look for certain lights to go on. If they do come on, then I edge my way in and start compressing a little bit more. But that doesn't happen very often because the system runs well with very little compression over it — it's a real rock 'n' roll PA. We do everything from rock to jazz to country to reggae, so the system has to sound good with different styles of music, but this PA definitely loves to do rock 'n' roll. It can be a little difficult when we have the acoustic acts here because it is really not meant to do that kind of thing, but we can squeak

out quite a bit before the system feeds back.

ON STAGE

We are running eight monitor mixes on stage from a Yamaha 2408 monitor console. Each of the eight mixes is patched through an old Altec 31-band, third-octave EQ, which are actually filters — you can only use them to cut, not boost. Most of the power for the biamped monitors comes from old Altec 9440's for the lows and Yamaha P2200's for the highs. Our wedges were custom-made in our shop at Horizon Sound and are based upon a design with two 12-inch drivers and a 2-inch horn (all drivers are JBL).

We found that we had a bit of a problem with conventional wedges and that was that the angle of the wedges didn't work well on our stage. The stage at Toad's Place is relatively shallow, so performers are standing very close to their monitors — almost right on top of them. With the typical wedge, the sound would blow right past them, so we designed our wedges with less of an angle so that the person can be close and still

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WRH



TOAD WARRIOR: The club's monitor system.

hear what the wedge is projecting.

Sometimes the monitor console can be a limitation because we only have 24 channels. Once in a while we'll get in a band that could have used a larger number of channels, and that requires either charting the console or hopefully they are carrying their own monitor console. The monitor situation becomes more

of a challenge when there are a few opening acts, but we still are able to make it happen by charting for the main act and then resetting the console.

We have received some good compliments on our monitor rig, which is really cool, especially when people look at it and say, "How old is all of this stuff?" Keeping up with the monitor system is actually easier for us than the house system because I only have about half of our wedges at the club. If I have a problem, I just bring a wedge from the club back to the shop and take another one. So I always have my complement of wedges at Toad's and there's always an alternate in the wings.

SOUNDCHECK

The room itself is a really tough room with plenty of wood and metal surfaces, so there's a lot of sound bouncing around and it needs absorption from bodies. In my opinion, soundchecks have to almost sound nasty. If you are expecting to have a sellout, your soundcheck is going to be harsh and annoying because of all the hard surfaces. When the place is empty, you're making adjustments, but you're really not hearing the changes and you're wondering what's going on. But when you pack the place full of people, all of sudden this PA is ready to do whatever it is that you want it to do. It tightens up, and if you make a little adjustment during the show, you'll hear it happen.

Sometimes I'll see an act come in with a really nice board and think, "It'd be great to have that in here." But on the other hand, for our purposes, it's better to have something

continued on page 129



"...DETAILED IN THE EXTREME."

*Pro Audio Review Magazine
Dr. Fred Basbour, reviewer*

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T TIME

Electro-Voice has expanded its T-Series line of high-performance speaker systems. The line now includes the T18 18-inch SubScoop™; the T22 12-inch, two-way; the T52+ 15-inch, two-way; the T53 biampable 15-inch, three-way; the T55+ dual 15-inch, two-way; the T251 biampable 15-inch, two-way; the T252 biampable dual-15-inch, two-way; the MTL1 dual-18-inch SubScoop™; and the MTH 1 two-way, horn-loaded coaxial system. Each enclosure is built from carpet-covered, 7-ply exterior grade, plywood. Steel corners, metal handles and heavy-gauge grills make the T-Series speakers roadworthy. For more details, contact Electro-Voice, Inc., A Mark IV Company, 600 Cecil Street, Buchanan, MI 49107. Tel: 616-695-6831. Circle EQ free lit. #135.

LITTLE EARS

Garwood Communications' Micro Monitors™ are a new line of custom molded ear



monitors that will work in conjunction with all Garwood ear monitor systems. Micro Monitors place miniature speakers in molded custom earpieces, which are linked to a wireless receiver that allow users to control their own volume and frequency response. The monitors are available in a variety of matte finishes to match the user's skin tone, reduce reflections and help the monitors blend in. The canal portion of the monitors are flexible and extend into the shell portion of the ear. The Micro Monitors' output provides up to a full 25–26 dB of attenuation while dual sound ports and a resonator extend the high and low frequency responses. For more information, contact Garwood Communications, Inc., Terry Dr., Suite 10H, Newtown, PA 18940. Tel: 215-860-6866. Circle EQ free lit. #136.

1-900-JBL

JBL's MR 900 Series is comprised of eight different loudspeaker models — all of which feature enhancements in sound quality, performance, cabinet construction, and in power duration capability. The new MR 900

series incorporates advances in sound quality protection (the addition of JBL's Sonic Guard™ circuitry), component technology (all MR 900 Series loudspeakers feature JBL's 2418H Compression Driver, new coil technology, new Kapton Coil Former, new 1-mil. thick diaphragm, and new metal back cover), power duration, crossover networks (which feature steeper sloped filters that reduce spectral overlap between drivers), and cabinet design (featuring high grade Valox™ corner protectors, improved insulation attachment and additional grille bumpers). For more details, contact JBL Professional, 8500 Balboa Boulevard, Northridge, CA 91329. Tel: 818-830-8278. Circle EQ free lit. #137.

BANDPASS WIND

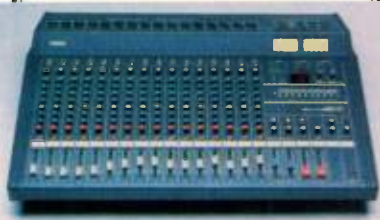
MTX has introduced the Power Series loudspeakers that consists of three 2-way fullrange speaker systems and one single reflex

bandpass subwoofer. The PWR112 features a 12" driver and a horn for full range applications. For additional SPL and low end, MTX offers the PWR115, which houses a 15" driver and a horn. The PWR215 features dual 15" drivers and a horn for larger areas and events. Finally, MTX offers the PWRS15, a 15" single reflex bandpass subwoofer. The low frequency driver in all models incorporates a die-cast frame for greater stability, a 3" voice coil, and an extended pole piece coupled with a flat spider that will produce a longer more linear movement of the cone. Each high frequency driver feature a titanium diaphragm with a 2" voice coil. MTX has also provided a sophisticated crossover network to protect against high frequency driver failure. For more information, contact MTX, The Pointe at South Mountain, 4545 E. Baseline Road, Phoenix, AZ 85044. Tel: 800-225-5689. Circle EQ free lit. #138.



RACK IN A BOX

Available in 12 and 16 channels, Yamaha's EMX3500 powered mixer is a complete, compact system that requires minimal setup and dismantling. The EMX3500 offers a clean 350 watts per channel into 4 ohm loads. Features include two sets of stereo power amp outputs, 3-band EQ with mid-band sweep, three aux sends, A/B inputs with XLR and 1/4" inputs, inserts on every channel, channel on/off, tape in and record out functions, high-pass filter, and 60 mm faders. The built-in DSP provides 15 top-quality effects and features a new Yamaha digital signal processing chip. Nine-band



Yamaha EMX3500 Mixer

stereo graphic equalizers make for overall response shaping and feedback control. Phantom power is provided for powering condenser mics, and peak and signal indicators are available on every channel along with two stereo VU meters. For more details, contact Yamaha Corporation of America, Audio, Guitar and Synthesizer Division, P.O. Box 6600, Buena Park, CA 90622-6600. Tel: 714-522-9011. Circle EQ free lit. #139.

PEAVEY POWER

Capable of 3000 W RMS into 4-ohms bridged, Peavey's CS 3000G professional sound reinforcement power amp weighs in at 65 pounds and takes up 3 EIA standard 19"

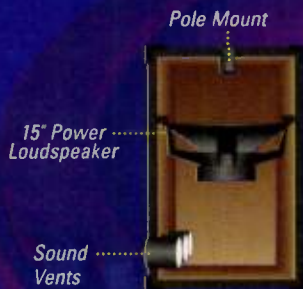
rack spaces. Harmonic distortion from 20 Hz-20 kHz remains less than 0.04%. The U.S. Government awarded Peavey engineers a patent on the circuit design of this over the top Class "G" power amp. For more details, contact Peavey Electronics Corporation, 711 A Street, Meridian, MS 39301. Tel: 601-483-5365. Circle EQ free lit. #140. **EQ**



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LEXICON PCM 90



NEW PRODUCTS don't come every day from Lexicon, so when they do arrive, they're bound to be special. Designed as a companion to the PCM 80, the new Lexicon PCM 90 is a digital reverberator. It won't do 35 effects at once and it won't do your laundry, but it will do killer reverb, echo, and ambience effects. Lexicon's intention is that you own both the PCM 90 and the PCM 80, as the two boxes are intended to complement each other. The 90 fills any effect "gaps" the 80 might have and vice-versa — sort of like tag-team DSPs.

The PCM 90 comes in a one-rack space chassis that has the exact same control array as the PCM 80.

The rear panel has MIDI in/out/thru ports, a detachable power cord, foot switch and foot controller jacks, S/PDIF digital I/O, stereo outputs on 1/4-inch TRS and XLR jacks, and stereo Neutrik Combo™ connectors for input. An input level switch selects between -20 dB (unbalanced) and 0 dB balanced input level. Analog inputs are fed to an 18-bit A-to-D converter and signals are internally processed via 24-bit digital bus.

The PCM 90 is shipped with 250 preset programs organized into five banks of

50: Hall, Room, Plate, Post, and Splits. Hall, Room, and Plate banks are self-explanatory; the "Post" bank is a collection of rather odd ambient spaces that include a stairwell, New York City tunnels, a bedroom, and a coffin! The "Split" presets are programs that turn the PCM 90 into a dual-mono machine where each input can be driven from a separate effect send on your console and simultaneously provide two stereo effects. Some of the available splits include delay/reverb, hall/room, and big/small room. This feature is very useful in situations where the number of available processors is at a minimum.

The PCM 90 is factory-set to "Go" edit mode, which limits the number of edit parameters to a "soft row." You edit programs simply by pressing "Edit," using the Select knob to scroll available parameters and Adjust to change them. (actually, one parameter from every program is pre-assigned to the Adjust knob so you can make changes without actually entering edit mode). Since the soft row contains 10 parameters (maximum), you won't have to scroll the Select knob forever to find the most needed ones. The soft row (which is unique for each program) is

limited to things like reverb decay time, predelay, or wet/dry mix, so there is little possibility of an inexperienced user screwing up a preset beyond recognition.

If you are an editing maven, you can set the unit for "Pro" mode (found in the Control pages) and have access to every parameter in the preset — which in some programs can number as high as 50. If you like Go mode but require different parameters in the soft row, Lexicon lets you change them. *Smoooooth.* And you can create a Custom Control that simultaneously adjusts a group of parameters via a single control.

PUTTING IT TO USE

Using the PCM 90 is a breeze. When you turn it

on, a self-diagnostic is performed and the unit loads the program resident when it was shut off. If you want to load a different factory program, press "Program Bank" to toggle through the five banks. Then use Select to scroll through the programs and press "Load" when you find the one you want. User programs are stored in two "Register Banks" of 50 programs each and are recalled in the same manner (PCMCIA cards will hold an additional 20 banks of 50 programs). This was easily figured out during my first road encounter with the 90, sans manual or the supplied "cheat sheet."

Go mode makes rudimentary editing fast and easy and works nicely for a

ROAD TEST

MANUFACTURER: Lexicon, Inc., 100 Beaver Street, Waltham, MA 02154. Tel: 617-736-0300

APPLICATION: Digital reverberator for live sound reinforcement and studio use.

SUMMARY: It's a Lexicon.

STRENGTHS: High quality of sound; easy to use.

WEAKNESSES: "Pro" mode of editing can be overwhelming to some users; expensive.

PRICE: \$2999.95

EQ FREE LIT. #: 141

BY STEVE LA CERRA

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Alan Howarth, Sound Designer on such films as Bram Stokers Dracula, Stargate, The Mask, Die Hard II.



In this age of global communications good news travels fast... especially in this industry. Talk to any of our users (there are over 2000) and they'll all tell you the same thing. Soundscape's SSHDR1 has the creative tools to improve productivity, the software is incredibly fast and reliable and saved them a great deal of time and money. This is why more and more of the worlds top professionals in sound design and motion picture editing are changing to Soundscape and the PC for their audio editing. From dialog replacement and Foley recording to that blockbuster movie soundtrack the SSHDR1 has some of the fastest and most powerful editing features available.

Is your existing Digital Audio editor expandable from 8 to 128 tracks, with real time editing while chasing time code and have fully parametric EQ? Does it give you 18 bit dynamic range and volume contours generated in real time, with professional I/O and audio quality uncompromised by noise from your computer. With glitchless audio scrubbing for accurate editing and perfect placement of sound effects. Soundscape offers all of this at a price much lower than you would expect.

"Love it - Love it - Love it - Love it - Love it !!! Great box, I've got two of them and session after session I rely on my Soundscapes to deliver the pristine sound that our clients demand. It vari-syncs and chases video like a hound dog and believe-it-or-not the owners manual is intelligible. And HEY!! - just do it... buy one!!!!!!" Sunny Lake, Cybersound NYC, sound designer/producer for numerous commercials, records and films.

We've had the pleasure of using Soundscape for sound editing on 'Ace Ventura: When Nature Calls' and 'The Nutty Professor' and found it to be very smooth, very fast and very reliable. Soundscape is the only intelligent choice for your next digital editing workstation. Odin Benitez, Randall Guth, Dimension Sound (Burbank).

It's affordable-it's modular-it's expandable-it's got crash proof reliability!!! We have 3 x 16 track systems at the studio, and we've used the SSHDR1 on almost every project that's come through the facility. Soundscape is fast becoming one of the top systems around in digital audio post production here as well as around the world. Keep it up, guys!" Frank Serafine, Sound designer on Star Trek, Virtuosity, Lawnmower man, VRS, Hunt for Red October.



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majority of purposes. In the studio where subtleties such as spread and shape are more apparent, Pro mode will service more effectively. But, in general, Lexicon has set up the soft rows so that the things you really want to adjust are accessible in Go mode anyway. One very cool feature of the 90 is that the unit stores a "history" of its 10 previously loaded programs. Press and hold both bank buttons and the display shows the previously loaded effect. Then use Select to scroll through the nine programs that had been loaded prior to that. So you can track down that "perfect" vocal reverb that you had loaded two programs ago.

The PCM 90 has two features particularly useful for live sound reinforcement. One is the "Tap" button: on certain presets such as "GtrBalladBPM," you tap the tempo of the song into the 90 and it produces echo in time to your music (quarter, eighth, half-note, and other values are possible). No more BPM-to-delay calculation charts. The other feature is KeyWord, which allows you to search for programs by description of their application.

It would take a book to describe all of the functions and features of the PCM 90. Actually, it does — and Lexicon gives you a well-written manual to document it all. As you would expect, the unit does a myriad of MIDI-related functions, from MIDI program change and bulk data dump to actually generating MIDI clock output from the tempo tap! External MIDI controllers can be used to modulate parameters such as reverb decay or delay time and the footswitch controller can be software "patched" to act upon specific program parameters.

Analog inputs may be set to a sample rate of either 44.1 kHz or 48 kHz, but I could

detect no audible difference between the two. When an S/PDIF signal is connected to the digital input, the PCM 90 will clock to the incoming source. And SCMS status of an incoming S/PDIF signal can be changed to either "No Copy," "One Copy," or "Multi Copy." There are separate controls for input and output level, which makes the PCM 90 easy to interface with just about any console. The aforementioned rear-panel switch selects 0 dBu balanced or -20 dBu unbalanced input level, and in the Control menu there is a page for selecting +4 dBm or -10 dBu output level.

There's a reason that Lexicon has always been regarded as a leader in digital reverberation technology. The PCM 90 continues that heritage, and it is evident in programs such as Medium Hall, Concert Hall, Vocal Hall2, and Room 4 Drums (my favorite for adding reverb to drums in a club situation). Reverb sounds are deep and wide, with smooth tails that lack the chatter or grainy quality you might hear from less-expensive units.

Mechanically speaking, the PCM 90 is well-built for the road but (as with any unit) you should support the rear during transport to avoid bending the front panel. My only gripe was with the Neutrik Combo input connectors: on certain male XLR connectors, the outer metal shell is too thick to fit into the circular receptacle on the Combo jack. This particular 90 sat in an equipment truck on some pretty nasty North-Western nights where temperatures went down as low as -10 degrees F. The PCM 90 never coughed (of course all units were allowed to come to room temperature before powering up).

Great sound, solid mechanics and ability to easily interface with just about any console combine to make the PCM 90 a must for your audition list. **EQ**

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CIRCLE 51 ON FREE INFO CARD

Noise Reduction For Windows



PRODUCTS REVIEWED: Cool-Edit Shareware Digital Audio Editor

Sound Forge Noise Reduction Plug-in

DART (Digital Audio Restoration Technology)

SADiE's De-noise Software

TO DATE, I'VE been able to track down four noise-reduction programs that work under Windows. Before we briefly explain each system, let's look at how software-based noise reduction works.

Technically, noise is an unwanted spectral component that is added to a recorded program either during the recording process or over time (as the medium deteriorates with age or extreme use). Like human fingerprints, both the frequency and amplitude components of noise are unique to each recorded program. It might include only a narrow range of frequencies (e.g., AC hum or room rumble) or it can be broadband in nature (e.g., tape hiss, amplifier noise, or buzzes). Likewise, the amplitude levels of noise will generally differ over its bandwidth from one program to the next.

FAST 'N' FOURIOUS TRANSFORMS

Since the spectral "fingerprint" of noise is unique to each recording, it's fairly obvious that any piece of software that removes noise in the digital domain can't be a "five settings fits all" type of program. It must be able to take into account the individuality of each type of noise. As a result, most noise-reduction programs involve taking a sample of the recorded noise and digitally analyzing its overall spectral components through the use of a mathematical process called FFT (Fast Fourier Transform). The resulting FFT calculations can be used to create a unique "noiseprint" that can then be mathematically subtracted from the original program file. In effect, such a noiseprint is used to digitally "cancel" the noise from the program, according to various user definable parameters.

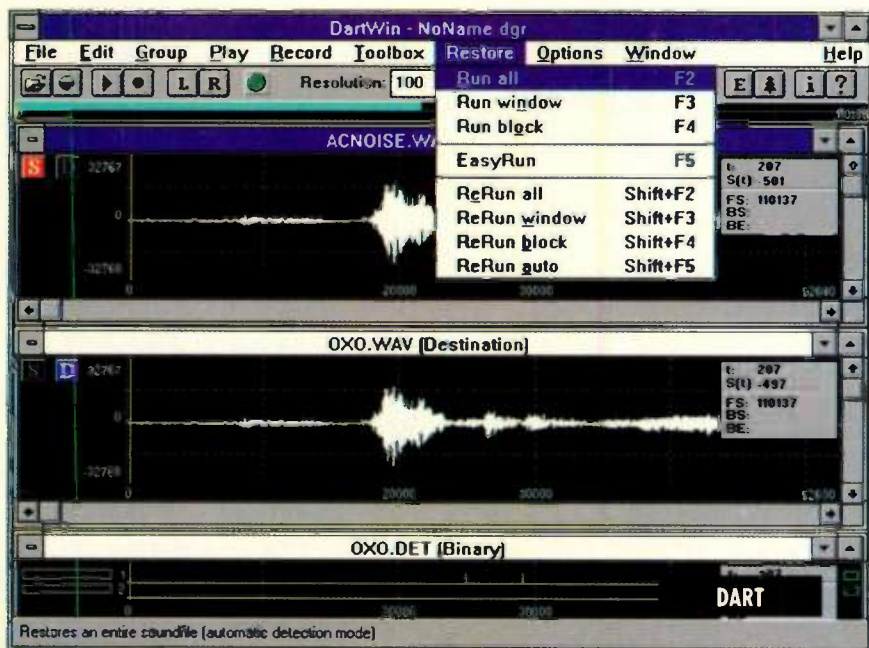
The elimination of clicks and pops, on the other hand, is generally carried out in a different manner. Depending upon the system, these sharp, high-level transients can either be simply edited out or replaced. Replacing clicks and pops with a short section of "good" audio is done by interpolating the audio before and after the glitch, which is effectively the making of a computational "guess" as to what the signal should sound like, and then replacing this glitch with the final, calculated results. Ahh, the miracles of science!

A FEW TIPS

One of the first things you'll probably run into when using noise-reduction software is the audible side-effects that occur when too much noise reduction is used. These generated "artifacts" (which often sound like weird warbling or bird chirps) occur when the noiseprint threshold is set too high, or when soundfile processing is applied too deeply. In such cases it becomes difficult for the processor to accurately differentiate between noise and actual program material. If this happens, simply undo the process and re-apply the noise reduction at a lesser degree of depth.

Although it does occur, most noise-reduction algorithms won't overly reduce the high frequencies of a soundfile. Nonetheless, we might perceive the resulting sound as being duller and less lively simply because the tape noise helped to create an upper-end "sheen." If this occurs, the obvious solution would be to either boost the soundfile's high end at your mixer or to gently equalize its upper end using the edit program's EQ application.

For you multimedia-heads, here's a trick that you might want to try out. Although noise reduction will work with 8-bit files (generally yielding a noise level that is, at most, -45 dB below the program signal), it definitely works better with 16-bit files. When dealing with noisy 8-bit files, a greater degree of noise reduction can be



achieved by first converting the file to 16-bit, applying noise reduction, and then reconverting the file back to 8-bit.

For the sample-heads in the crowd (like me), have you ever given up on sampling a killer sound from CD because another musical note was sustaining over the top of it? Try treating the sustain as noise by making a noiseprint of it. The program will subsequently treat it as noise and reduce it in level. It may not be totally eliminated, but it can often reduce the sustain to such an extent as to render the sample usable. On the wild 'n' wacky side, a friend at Sonic Foundry told me that by making a noiseprint of certain vowel sounds, it's possible to eliminate those vowels from a vocal line, making for a unique and even eerie effect. Fun, eh?

OK, let's take a quick look at four of the systems currently on the market. All except one of these programs are able to work with any multimedia soundcard with no difference in performance (relative to the quality of your installed hardware). You'll notice that I've refrained from making subjective opinions about each of these programs. Three of the four programs make use of FFT transforms to accomplish noise reduction. As a result, they function in a similar fashion. Since the sonic variables to be calculated change with each and every piece of recorded sound, offering a qualitative opinion would be a bit like...searching for the "perfect" mic.

COOL-EDIT SHAREWARE EDITOR

Shareware Distributor: Syntrillium Software Corporation, PO Box 60274, Phoenix, AZ 85082-0274. Fax: 602-941-8170. E-mail: syntrill@aol.com. World-Wide Web: <http://www.ep.se/cool> (Courtesy of ElectroPost, Sweden).

Price: \$50 for Basic Registration; \$100 for Preferred Registration

EQ Free Lit. #: 142

Until rather recently, David Johnston's Cool shareware program, was the only Windows-based noise-reduction software available on the market. Although it's shareware, it would be a big mistake to underestimate this program. For sheer processing power, this puppy has tons of toys under the hood, including resampling, effects,

EQ, time-stretching, and frequency analysis — just to name a few.

Like most systems, Cool uses FFT analysis to remove noise artifacts from a soundfile. Once a short segment containing noise has been defined, the "Set Noise Level" button is clicked to gather the statistical information. After the section to be processed has been highlighted, pulling up the noise-reduction window will reveal a colorful spectral display of the noiseprint. Then, it's simply a matter of setting the Noise Profile to the desired level and hitting "OK." That's pretty much all there is to it.

SOUND FORGE PLUG-IN

Manufacturer: Sonic Foundry, 100 South Baldwin, Suite 204, Madison, WI 53703. Tel: 608-256-3133. WWW: <http://www.sfoundry.com>.

Price: \$249

EQ Free Lit. #: 143

The folks at Sonic Foundry have been hard at work creating a number of plug-in programs designed to work with its Sound Forge sample/soundfile editing program. Among these are its new noise-reduction and click-removal plug-ins.

Once a soundfile has been opened into Sound Forge and a small portion containing noise has been highlighted, a noiseprint can be created by pressing the "Get" button. Once calculated, a graph is then created that displays the noiseprint spectrum. By pressing the "Fit" button, a number of "envelope points" will be automatically inserted at a level 6 dB above the noiseprint floor. Raising or lowering these envelope points will determine the amount of FFT processing that will be applied to the soundfile, while a

vast array of controls can be used to tailor the signal to best suit the program material. All that's left is to press "OK" to remove the noise specified by the envelope points.

The click-removal plug-in can be used to remove clicks and pops. For the most part, this algorithm is used to automatically or manually remove short aberrations by looking at the audio just before and after the event and replacing it with an interpolated section (in short, making an educated guess as to what is missing). A new special, vinyl-restoration plug-in should be available as of this writing. [See EQ's April and August '95 issues for a full review and update, respectively, on the Sound Forge system.]

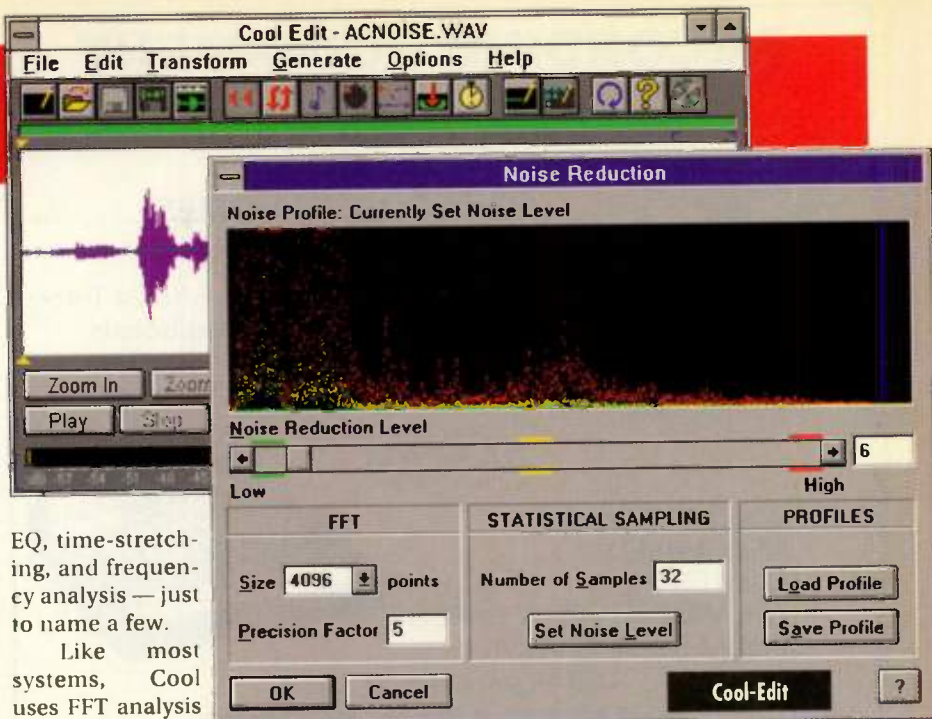
DART (DIGITAL AUDIO RESTORATION TECH)

Manufacturer: Tracer Technologies, PO Box 188, Dallastown, PA 17313. Tel: 717-843-5833.

Price: \$399

EQ Free Lit. #: 144

As its name implies, DART (Digital Audio Restoration Technology) has been primarily designed for the restoration of archived audio recording. It differs from all the other programs in that it uses a Kalman filter. This type of adaptive filter functions by mathematically searching for noise-based deviations in the program's waveform material and predicting what the waveform should most likely sound like. Unlike FFT-based systems, the primary side effect of overusing a Kalman filter is the loss of high frequencies. Should this occur, simply



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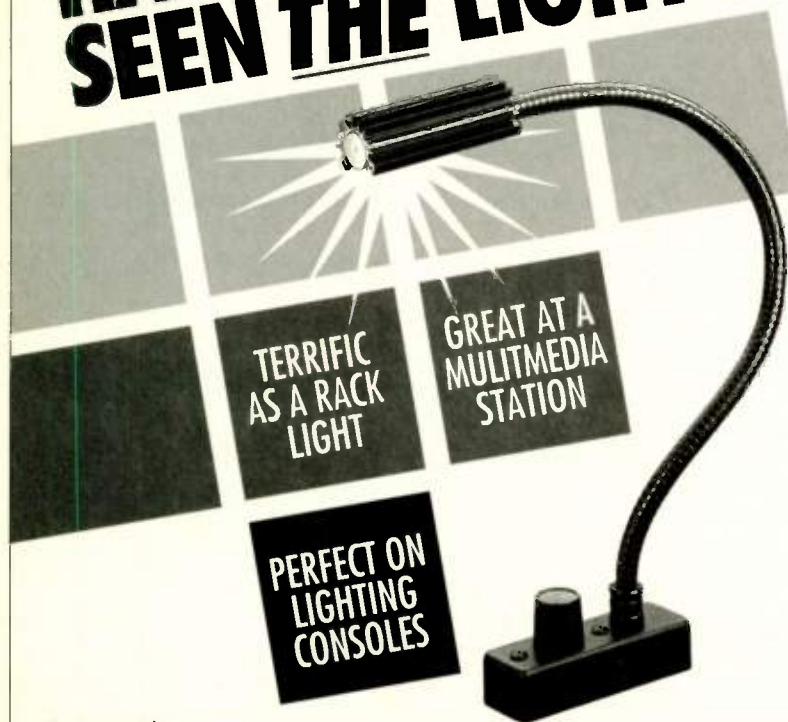
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Sound Forge Noise Reduction Plug-In

undo the process and re-apply the filtering to a lesser degree or accept the processing and boost the highs at the console or with EQ processing.

The DART program uses three different stages to perform soundfile restoration. The "Smoothing" stage uses Kalman filtering to smooth and reconstruct the overall signal; "Postfiltering" selectively suppresses noise on silent parts of the recording, thereby leaving the louder program passages unaffected; the final "Detection Threshold" stage is used to detect clicks, pops, dropouts, and other localized disturbances. Any or all of these stages can be run on a soundfile, using a wide range of variables.

SADIE'S DE-NOISE SOFTWARE

Manufacturer: SADiE Inc., Studio Audio Digital Equipment, Inc., 1808 West End Avenue, Suite 1119, Nashville, TN 37203. Tel: 615-327-1140. Price: \$3000

EQ Free Lit. #: 145

The SADiE's De-noise program differs from all the others in that it has been designed to work with a specific piece of hardware — the SADiE digital audio editing system. [See EQ's August '95 issue for a complete review of the SADiE system.]

This plug-in program was codeveloped by SADiE and Cedar Audio. It uses a simple, two-fader control panel for varying the degree of applied signal processing (gain) and the amount of processing that is applied to the soundfile to reduce the noise floor (attenuation). A noiseprint can be created during soundfile playback by simply holding and releasing the mouse button; thereafter, the noise reduction process can be applied to a soundfile in real-time. That's not to say that this noise reduction plug-in can be inserted into the audio path in real-time, it can't. Due to a licensing arrangement with Cedar, the resulting calculations can only be written to disk in real-time, then they can be played back from disk.

—David Miles Huber

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CIRCLE 28 ON FREE INFO CARD

Steinberg ReCycle



MANUFACTURER: Steinberg North America, 9312 Deering Ave., Chatsworth, CA 91311. Tel: 818-993-4091. E-mail: steinberg@aol.com.

SUMMARY: If you work with sampled loops, you need this program!

APPLICATION: Macintosh and Windows program that makes it a snap to integrate sample loops with MIDI sequences.

STRENGTHS: Can save you hours of tedious loop editing; Mac version converts between AIFF and Sound Designer II/I formats; Windows version converts between AIFF and .WAV formats, audio CD of demo sample loops included.

WEAKNESSES: Current version only works on mono 16-bit, 44.1 kHz files and only supports a limited number of samplers (future version will support stereo files and additional samplers); no audio scrubbing; no provision for saving file settings.

PRICE: \$199 (version tested: 1.1)

EQ FREE LIT. #: 146

THE HALLMARK of a great piece of software is either that it enables you to do something that you couldn't possibly do otherwise, or that it saves you time in doing something you could do otherwise. In the latter category are programs such as word processors or spreadsheets. For musicians who use sampled rhythm loops of any kind — drum loops, percussion accents, bass lines, etc. — Steinberg's ReCycle is a program that falls firmly in this category. It doesn't actually do anything you couldn't do manually in a sample editor (or, for the really bold, from the front panel of your sampler), but it does it a whole lot faster than you ever could.

So what exactly does the program do? First and foremost, ReCycle allows you to set extremely accurate loop

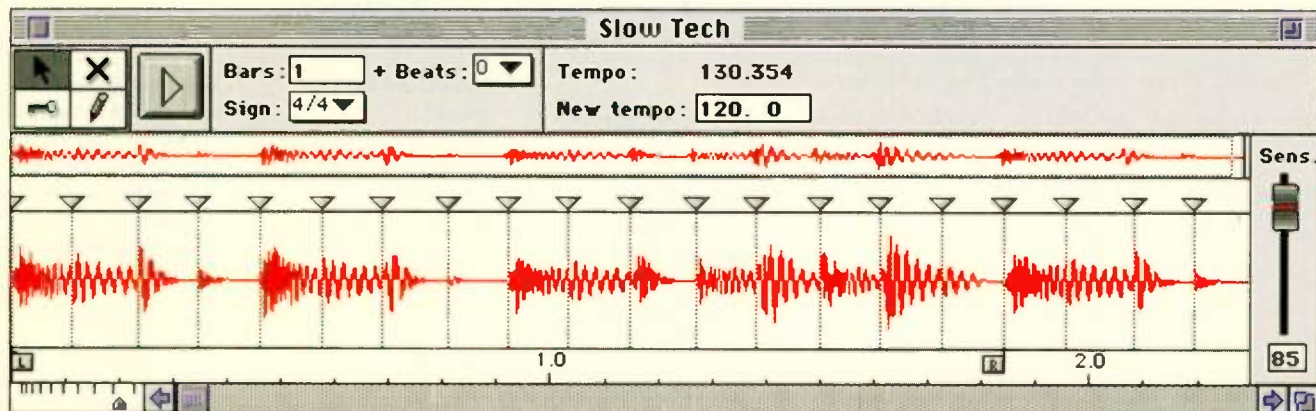
start and end points and it makes it easy to integrate your sample loop into a MIDI sequence. It also enables the tempo of a loop to be changed without changing pitch — and it does so without using time compression/expansion routines, which often produce undesirable digital artifacts. What's more, ReCycle's simple-yet-elegant user interface means that you'll learn how to use the program in minutes and that you'll be getting results almost instantaneously.

Here's how simple the process is: Import any monophonic 16-bit 44.1 kHz sample file and then click a button to play the file back. As it plays, move an onscreen "sensitivity" fader — ReCycle then uses an intelligent algorithm that searches for transients in

order to locate each of the individual sonic components within the file. If the sample file is a drum track, each of these components (called "slices") will be an individual drum hit; if it is a bass track, each component will be an individual note. To preview the sound contained within each slice, simply click on it — the Mac version of ReCycle supports all Sound Manager 3.0-compatible hardware, such as the Digidesign cards, so you can preview in full 16-bit mode. Left-right markers appear at the start and end of the file and can be snapped to any slice start point, making it incredibly easy to set extremely accurate loop start and end points.

If ReCycle finds some false slice points (for example, in a drum flam, it may find both hits), individual slice points can be hidden. Conversely, if it misses some slice points (as it may do at lower sensitivities), you can manually insert them. Zoom in and out tools make the process easy, though I could see how it could be made easier still if some kind of audio scrubbing tool were available as well.

Next, tell ReCycle how many bars and beats are contained within the loop — it automatically calculates the loop's tempo. At this point, you can either download the individual slices between the left and right markers to your sampler (assigned one to a key; currently supported samplers include Digidesign's SampleCell and various Akai models — see sidebar for more



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SYSTEM REQUIREMENTS

Macintosh: 68020 or higher processor; System 7.0 or higher; minimum 4 MB of RAM; 2 MB free hard disk space. Sound Manager 3.0-compatible 16-bit sound cards (such as Digidesign cards) supported.

Windows: 386DX/33 or better processor; Windows 3.1 or higher, 4 MB of RAM; 2 MB free hard disk space; 16-bit sound card. MIDI interface and/or Adaptec-compatible SCSI interface required for communications with Akai samplers (see list below).

Both Mac and Windows: Samplers supported include Digidesign SampleCell; and Akai S1000, S1100, S2800, S3000, S3200, and CD3000. (Additional samplers to be supported in next update will include E-mu ES1-32; Ensoniq EPS 16/16+ and ASR-10; Kurzweil K2000/K2500; and Roland S-760.)

details) or you can export them in a number of standard file formats (SDI, SDII, or AIFF in the Mac version; .WAV or AIFF in the Windows version). These samples can optionally be gain normalized; this will provide the best signal-to-noise ratio of each individual sample but will also alter the dynamic balance between samples. At the same time, you can instruct ReCycle to generate a MIDI file that will play back the sample slices, one after the other, at the original tempo.

ReCycle also gives you the option to specify a new tempo at which you want the loop to be played back, and the MIDI file generated will follow that new tempo. The magic of all this is that, by breaking a loop up into its individual components and by triggering each component from a discrete MIDI note, you can alter the tempo of the loop without changing its pitch.

One potential problem is that if you slow down the tempo of the loop, there will be silences after each slice is played back. These silences may be apparent, especially if there is ambient sound in the sample. ReCycle cleverly addresses this problem through the use of a "stretch" function in which short backward-forward loops are added to the end of each slice, thus extending each sample by a certain user-defined percentage. Since the end of a slice most likely contains only ambient sound (or, at worst, the tail-off of the sound), this works remarkably well.

It's not even so much what ReCycle does, but what it allows you to do after the fact that makes the program so impressive — the fun really starts after you've created and downloaded (or exported) all the individual slices and the MIDI file. For example, if your sampler provides multiple hardware outputs, you can route each component to a different output for additional mixing control, even applying different effects processing to each sample. Get bizarre

by reversing playback of individual components or experiment by substituting different sounds — simply assign a different sample to individual key numbers. In your MIDI sequencer, you can, of course, change tempo to your hearts content, and, if you're using Steinberg's Cubase Audio (or another sequencer that supports "groove" templates), you can even quantize MIDI tracks to the feel of the sampled loop.

ReCycle ships with an audio CD of demo loops as well as a concise owner's manual that contains a brief tutorial — the Macintosh version also includes drivers and extensions that enable you to use it with any Digidesign sound card. My few major complaints are that stereo files are not supported and that direct downloading is only possible to a few select sampler models (Steinberg tell us that stereo file support and direct download to additional samplers will be provided in a soon-to-be-released update).

An oddity worth mentioning is that unlike virtually every other piece of software in existence, ReCycle doesn't allow you to save your work, the thinking presumably being that once you've downloaded or exported your data, you're done. But I could imagine scenarios in which the user might want to go back and tweak some slice points or set different loop start/end points, so I do think this is an omission of note, though not necessarily a serious problem.

All in all, ReCycle is a program that successfully combines stunning simplicity with incredible utility. If you work with sampled rhythm loops, do yourself a favor and check it out.

—Howard Massey

Howard Massey heads up On The Right Wavelength, a MIDI consulting company, as well as Workaday World Productions, a full-service music production studio. His loop start point rarely coincides with his loop end point.

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86	Discount Distributors	30	516-563-8326	106	Sound Deals	71	800-822-6434
3, 85	DOD Electronics	31, 22	801-566-8800	87	Soundcraft	73	818-893-4351
52	Earthworks	92	603-654-6427	105	Soundscape	74	805-658-7375
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145	Full Compass	95	800-356-5844	16-17, 27	TASCAM/TEAC America	76, 80	213-726-0303
99	Furman Sound	37	415-927-1225	44	The John Hardy Company	93	708-864-8060
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64	Harris Allied	41	217-222-8200	94	West L.A. Music	84	310-477-1945
71	Harris Institute for the Arts	42	416-367-0178	14	Whirlwind	85	716-663-8820
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10	Institute of Audio Research	44	212-777-8550				
130	International Audio	45	708-734-1695				
148	JBL Professional	XX	818-895-8190				
86	JRF Magnetic Sciences	48	201-579-5773				
131	Klarity Cassette	49	800-458-6405				

ART Pro Gate



MANUFACTURER: ART, 215 Tremont St., Rochester, NY 14608. Tel: 716-436-2720; E-mail: artroch@aol.com.

APPLICATION: Remove residual noise and add gating-related special effects on up to eight independent channels.

SUMMARY: Has everything you'd want in a noise gate — and then some.

STRENGTHS: Great interface; extremely flexible; relay signal bypass; programmable; lots of MIDI options; microwave oven includes temperature probe (just kidding).

WEAKNESSES: Slight mechanical hum from transformer (hum is not present in signal path) when on.

PRICE: \$1095

EQ FREE LIT. #: 147

I CAN JUST see the design meeting that created this product: "Make a noise gate with everything — we don't want any reviewer to say we overlooked a feature!" So you get a 2U, 8-channel programmable noise gate with not just the expected, but fancy stuff like:

- Link gates in pairs or groups (and unlink all if desired)
- Save all parameters as a song (20 songs total), selectable via MIDI program changes, and capable of bulk dump/load
- Real-time MIDI control over gating parameters
- Sends MIDI note on/note off when the gate opens to control other devices
- Name any of the eight channels

- Idiot-proof interface — one complete set of controls per channel, which you can switch to any of the eight available channels

- Relay bypassing for each channel, so no electronics mess with your signal, and no signal cutout if it blows a fuse

- "Lock" toggle so people twiddling with the knobs won't alter your settings (bar bands rejoice)

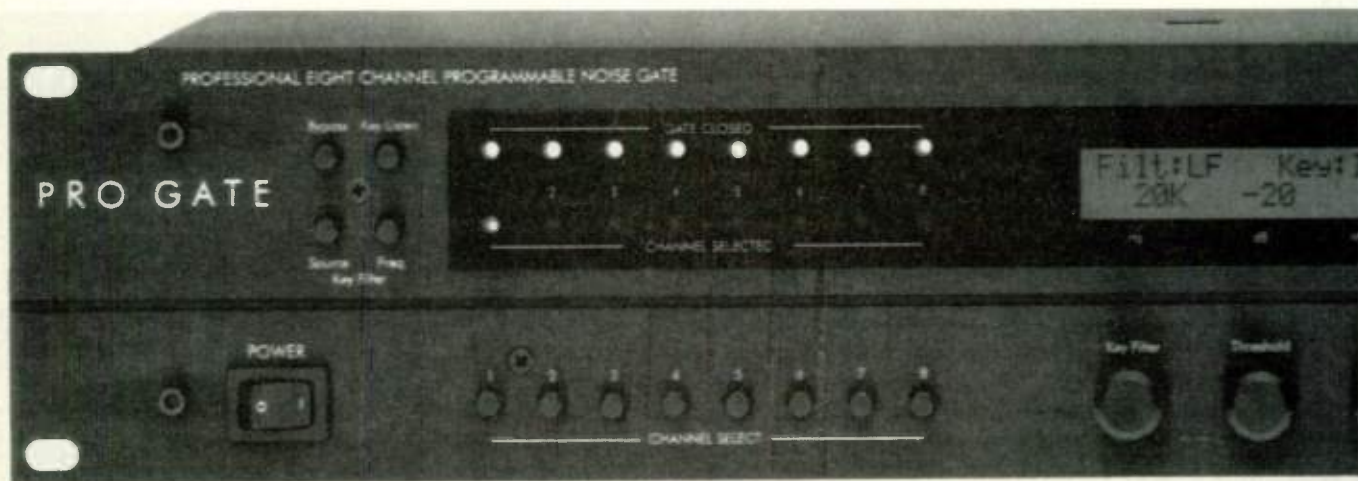
- Microwave oven (just kidding)

You get the idea. But before you think this is overkill, remember that gates aren't just for cutting out noise — gating one signal with another produces some wonderful tricks for dance music, as well as other applications. In short, you may not want to get creative about your gating, but if you do, this is the box.

The keying functions are very sophisticated. Each gate has a low-pass and high-pass filter (with 26 selectable frequencies) for tuning the key circuitry to respond only to signals occurring within a particular frequency range. Gates can be keyed by the internal signal, an external signal plugged into the key input, or via MIDI.

Threshold can be set in one dB increments from -50 to +16 dB. Attack time is adjustable from 20 ms up to 500 ms, hold (determines how long the gate stays open after being triggered, even if the signal goes below the threshold) has 69 options from 4 to 4000 ms, and release has 60 release (fadeout) options from 3 to 4000 ms. Gating doesn't have to be on/off; there are 29 attenuation settings, from -82 to -2 dB. You therefore aren't limited to gating, but can actually reshape a signal, like run reverb through the gate and give it a long attack for a "reverse reverb" effect, or create "attack delay" effects for guitar.

Fig. 1 shows a "snapshot" of the gating action. The upper waveform is the input signal, the lower waveform, the gated signal. In the left pair, the attack time equals 20 ms; clearly, the attack is essentially instantaneous. The shaded waveform shows an attack time of 20 ms (the region duration is in the lower right corner). Note how the attack



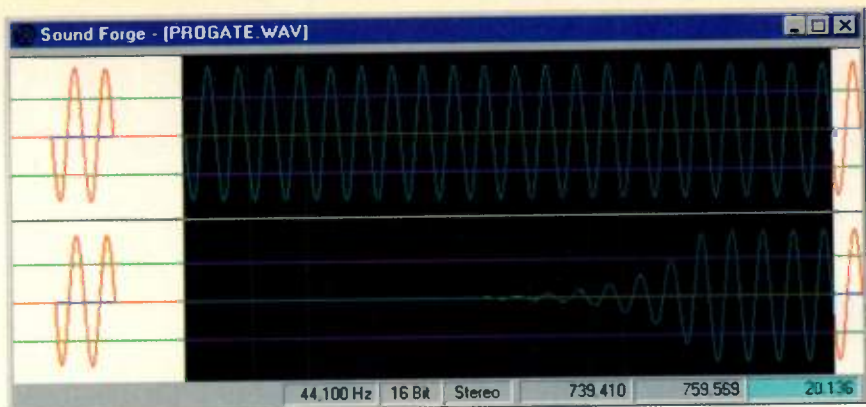


FIGURE 1

is highly exponential, with most of the duration at very low amplitude before ramping up to maximum level. I also checked calibration on the hold and release times, which correlated exactly with the settings displayed on the LCD.

Each gate has signal in and out, 1/4-inch balanced/unbalanced jacks (a menu toggle selects between the two globally; if you use unbalanced connections while in balanced mode, you'll lose a few dB of signal), and a 1/4-inch unbalanced key input. A separate output carries an "audition" signal that monitors the key input for the channel being programmed so you can evaluate the effects of any filtering you add, or check whether a signal is actually present. This is a very cool feature. Furthermore, there's MIDI in, out, and thru.

You can copy settings from one channel to another, but the MIDI options are where the action is. Each gate can respond to its own channel and MIDI note value to turn the gate on/off, as well as generate a MIDI note value that's sent when the gate opens and closes (for triggering drum modules or other processors; for example, replace a weak drum sound on tape with a beefy external module). What's more, the attack, release, and threshold values for

each channel can respond to MIDI continuous controller commands.

A unit this sophisticated is not needed for many applications, and I wonder if anyone will ever use *all* its features. But if your needs go beyond plain vanilla gating, this delivers papaya/mango/ pineapple gating, and a shot of Cuervo Gold in a tall glass with a little umbrella. It's not just a gate, but a creative tool for chopping and shaping music during the mixdown process. Remixer's will probably go nuts with this box; best of all, despite the plethora of parameters, it's easy to figure out and use. (By the way, the Pro Gate follows Anderton's law of manuals: "Devices that you could figure out anyway without a manual always have the best manuals." Go figure.)

ART may have gone over the top on this one, but for some people, it will be a treat to use a unit that instead of cutting corners, includes more corners than an M.C. Escher drawing. If gating is your thing, I strongly doubt that you can find anything better out there, and you surely won't find something that's more fun to use or offers more creative potential. If they made a 4-channel version for half the price, I'd buy it in a second.

—Craig Anderton



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Qup Arts Sample Discs

A quick look at
some sampled sounds

STEVE GADD DRUMSCORES

This is a two-disc audio CD set (almost 74 minutes each) of NYC studio drummer Steve Gadd (also available on CD-ROM for the Ensoniq ASR-10).

This disc handles drum loops a little differently; first, you'll hear 1–2 minutes of Steve playing a continuous drum part, followed by a breakdown of this part into several loops. These are typically 8 to 16 loops total, 1 to 8 bars in duration, and generally have fills at the end. The cool thing about this approach is that if you just want loops, you can grab the loops — which have been edited so that if you put loop markers on the

first and last samples, you'll get a perfect loop. But if you don't like the loop points, want longer loops, or need to customize the performance somehow, you can sample the original part and divvy it up however you want.

Gadd's style is high on detail. These are the kinds of parts you'd expect to hear behind Paul Simon, Chick Corea, or Steely Dan — not Green Day or Led Zeppelin. There's a good mix of brush and stick parts, some killer samba riffs, and really nice slow grooves and shuffles. The parts are very precise, but avoid sterility; they cut through well without being overbearing. As is the custom with drum-loop CDs, there are also many individual hits for sampling. These are identified according to kit, so you can overdub individual hits over loops created with a particular kit and retain sonic consistency.

All in all, this disc shows why Steve Gadd is such an in-demand session drummer: great drum sounds and a strong, yet delicate, touch that really masters dynamics. I don't use drum loops a lot, but some of the ones on here are compelling enough to make me want to fire up the sampler and start groovin'. —Craig Anderton

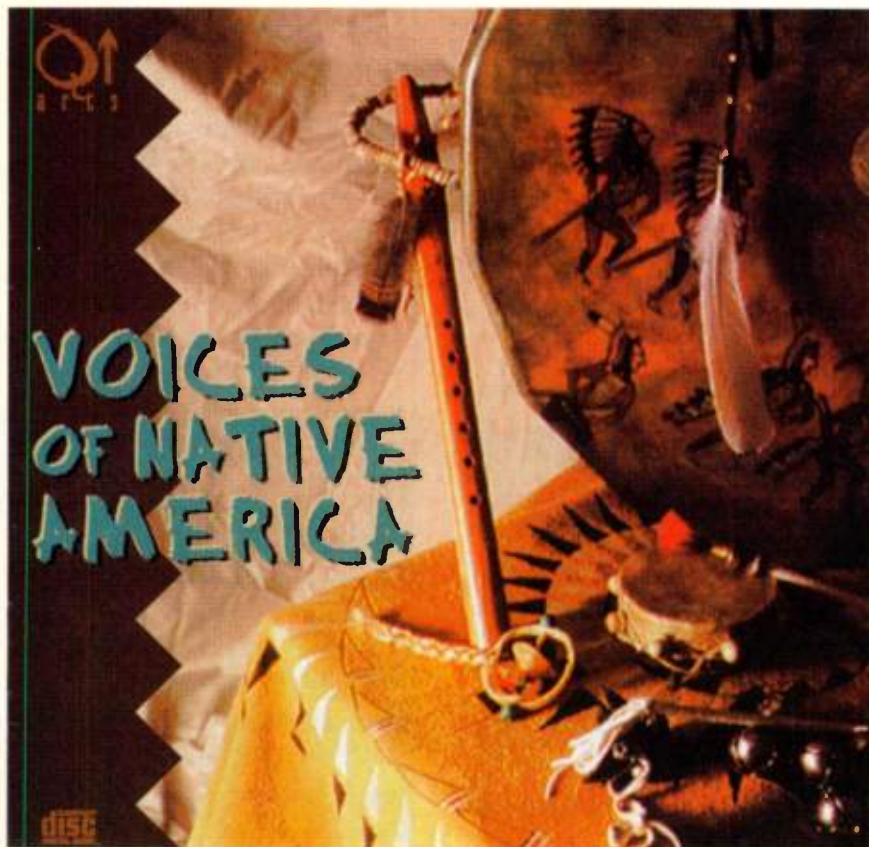
Two-disc set, \$179; the two discs are also available separately for \$99 each. The ASR-10 2-disc CD-ROM is \$249. Contact Qup Arts, PO Box 686, Sandy, UT 84091. Tel. 800-454-4563. Circle free lit. #148.

VOICES OF NATIVE AMERICA

A few years ago, I happened to meet Douglas Spotted Eagle, the driving force behind this CD, while I was doing a lecture at a music store. He showed me some of his flutes and said, "There's no way you can sample what these do." Fortunately, somewhere along the line he changed his mind; this disc contains almost 72 minutes of samples of flutes, percussion, shakers, and vocals, along with a demo at the beginning that gives a feel for how to use them.

The sounds are very well recorded. For percussion, there are multiple samples at various dynamic levels and with various mallet strikes. Most samples are in stereo. If you've listened to Native American music before, these sounds will not come as a real surprise, although some samples — such as "Rubbing Drums" — take on a very different, and provocative, quality when heard in isolation. The flute samples are split approximately 50–50 between actual performances (some processed with Lexicon 300 reverb), and dry, one-note-at-a-time samples. The performances maintain the sort of expressiveness you're just not going to get if you assign individual notes to individual keys on a sampler.

My one complaint would be the paucity of rhythmic loops — six drum and six shaker loops. Furthermore, the drum and shaker loops do not have any compatible tempos, so you'll need to use pitch





bending to bring them into line if you want to use them together. But this is not a "dance mix construction set" CD; you need to build the music yourself. This doesn't bother me, but if you're looking for something where you can pull a few samples and put together an effortless groove, look elsewhere. The main application for this disc seems to be soundtrack work and creative musical adventures.

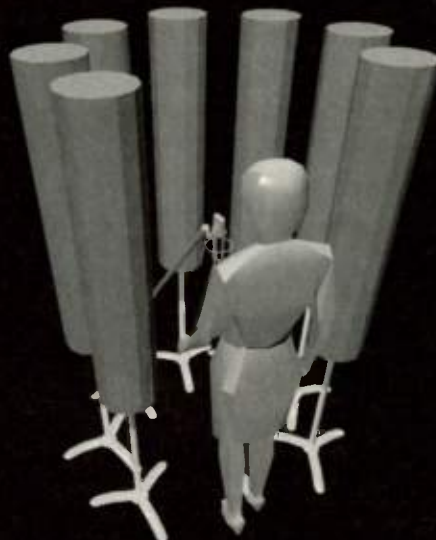
In addition to the flutes, the vocals (tracks 23-31) are particularly rich. Unfortunately, there is nothing in the otherwise very well done liner notes to suggest if these vocals have any particular meaning or context. I assume some people will use them as hip substitutes for the James Brown "heys!" that swept the world like an epidemic when sampling first appeared, but they deserve a better fate than that. If you consider them as musical sounds and spend some time putting them together as carefully as you would any solo, you will be rewarded with a lead line that is evocative, and perhaps even speaks from a different time.

Technical and musical excellence notwithstanding — this is an extremely well-crafted CD — the overall impact of this recording is quite emotional. I've spent a lot of time in the Southwest the past few years, and can see what was once the dominant culture torn between slipping away and trying to reinvent itself within a majority civilization that has no frame of reference for understanding Native American ways. I defy anyone to listen to this CD and not feel that there's more to these sounds than just digital waveforms. It's very moving, and a little sad when you realize that a hundred years from now, the traditions documented by this CD may have gone the way of the carrier pigeon. Let's hope not. —Craig Anderton

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MACKIE ULTRAMIX

continued from page 77

fader (indicating VCA level) and the clear or "glass" fader (indicating physical position or a preset value of the Ultrapilot fader). In a new session screen, the white faders are at the bottom of their travel and do not pass audio. You cannot get the white faders to move — and thus pass audio — unless you are in either Record or Rehearse mode; or have set the fader levels to unity gain setting using "Modify Levels" (we typically made the first pass in record). Record-enable the desired channel by clicking its record button on-screen or by using the buttons on Ultrapilot. Then hit "record," roll tape, and start bringing up faders on the Ultrapilot.

At this point, it really doesn't matter where you set the faders; you just want to hear some audio and have a starting point. Since Ultrapilot can only address 16 channels at a time, you must use "Bank Select" to adjust channels 17-32. At the end of the song, leave all faders at their rough position and wind the tape to the beginning of the song. Hit "record," roll tape, and have a cup of coffee: Ultramix will now write your fader positions throughout the entire song.

Now you can begin to refine the mix. This can be done via five global modes: Replace, Null, Trim, Mute, and Automute. Replace mode (the default) lets you make almost instantaneous changes in fader level. Set the glass fader to a spot different from the white fader and then punch into record. The VCA level jumps from the previous position to the current setting of the glass fader. This mode is useful for making very fast moves such as punching up a tom fill. It's way faster than your fingers and the VCA level changes more quickly than the screen actually shows. Replace is used much like punch-in on a tape recorder, where you search and destroy sections of the song and modify levels.

If you'd like to make more musical or subtle changes in fader level, use Null mode. In Null you are not actually recording a change in VCA level until the glass fader "picks up" the white fader. For example, to slowly swell a string pad, move the Ultrapilot (glass) fader below the white fader, punch into record on that channel, and then slowly ease the glass fader towards the white fader. When the two are in the same position, Ultramix will update the fader move and begin to record the move you are now making, just like the big-boy-toys. When you punch out, the VCA

level will return to wherever it was at that point in time on the previous pass.

Trim mode will most likely be used towards the end of a mix session, where the moves are good but the overall level of a track is a bit too low. Trim acts like a level-offset control. Enable a channel and hit the master record button (since you have not pressed play, tape is not rolling and Ultramix is not yet recording). Then position the glass fader above or below the white fader and use it to bump the position of the white fader up or down. Hit play (Ultramix is now recording) and you will still see all of the moves you had previously written — but they will happen at a level offset from the original.

The remaining two modes of record address muting functions, both of which can be recorded in separate passes from fader moves. Automute is similar to having a gate on every channel, but there are only three levels of automute: low, medium, and high. You can do separate automute passes at different thresholds for different instruments. On our wish list: automute with a continuously variable threshold. The "normal" mute mode is exactly what you'd expect: put the system into record-enable, and pressing the mute button on a channel does exactly that. One very cool feature of Ultramix is that although soloing a channel does effectively mute the remaining channels, solo during record will *not* write mutes to the other channels (nondestructive solo, just like Mackie mixers). If you write a mute over a fader move and then remove the mute, the fader data is still intact. The fader moves are independent from mute moves.

GROUP THERAPY

One of Ultramix's slickest features is the grouping function. Eight color-coded groups are available, and since they are VCA groups, each can perform in stereo. Any channel may be simply assigned to any group: select each channel to be grouped and then either hit "command-g" or pull down "group" from the faders menu. A pop-up window will ask you to select a group. After you have done so, the selected faders will change color to match their group.

Intelligently, the group fader appears at unity, which means that you have not messed up the levels of the grouped channels. You may now do automated moves on the group with a single fader. Any individual fader changes you have made will be retained. If you de-assign a channel and then make a group move, when you reassign the

same channel to the same group, that one move will not affect that channel.

For super-fine tuning fades and mutes, Mackie gives you an event editor. This is a "hit list" that shows every event occurring in a mix. Select a channel, hit "command-e," and the list appears for that channel. You can add as many channels as you want to this view, though it would make sense in most cases to view one channel at a time.

Every event (mutes, automutes, fade ins, fade outs) has a corresponding time, and you can change the timing of an event simply by clicking on the time-code number and typing in a new value. In order to keep this window from overwhelming you with information, Ultramix lets you select which channels and which events are displayed.

Mackie has loaded Ultramix with a lot of firepower, including quite a few keyboard shortcuts that are not explained in the current Ultramix manual. After selecting a channel you can make it write-ready ("w"), safe ("e"), mute ("m"), unmute (","), fade down ("f"), fade up ("g"), solo ("s"), or unsolo ("d"). Ultramix can import and play standard MIDI files, so if you are mixing virtual tracks, you don't have to concurrently run a sequencing program. Hardcore MIDI-lots can write MIDI program changes to automate their effects with frame-accuracy. Ten autolocate registers are available that work like those on a tape machine, and since Ultrapilot can be moved from the console, you can mix from the best seat in the house. Ultramix is capable of simultaneously automating four Ultra 34's just in case you need more automated channels.

IN SUMMARY

We did encounter a bug or two when we tried version 1.0 of Ultramix. Occasionally the master fader would mysteriously mute on its own and if we tried to save a fader template (such as a "unity" screen) as a stationary pad, the program would not be very happy. This seems to have been corrected in the latest version (1.02), so if you have 1.0, call Mackie to get the update — which is free of charge.

The authors would like to thank Frank Heller at Weasel Boy Recording for his invaluable help in the preparation of this review.

—Steve La Cerra and Mitch Glider

Mitch Glider, a 15-year veteran of the "mid-level" recording business in the New York City area often finds himself working out of his favorite studio End Result Studios in Brooklyn, NY.

LOOK AT WHAT THEY'RE SAYING....

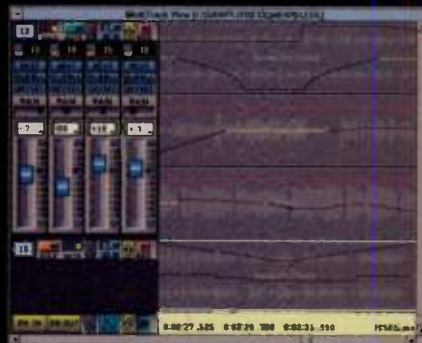
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AMEK REMBRANDT

continued from page 74

in that it'll mute everything that is not soloed. One of the advantages of this is that you can put your reverbs into Solo Safe mode and they won't be muted. This way you can hear the pan as well as the reverb. You use the regular console Solo mode for tracking because this way you wouldn't accidentally hit the SIP mode and mute all of the inputs and kill the signal to tape. The SUPERTRUE-operated solo system is used for mixdown so you can hear the signal with the reverb.

The solo functions have a really neat feature in which there are three modes that they can be switched between: latching, interlock, and momentary. Latching allows you to hit multiple solos at one time; interlock cancels the first of two accessed solos; and momentary keeps the channel soloed for as long as the button is pressed. The Solo Clear button is a very cool function that when pressed will clear all solos. This is good because there are a lot of buttons on this board, and if you're not getting any signal, sometimes something as simple as checking for solos is overlooked. This button does the trick.

G FORCE

The Rembrandt has a variety of switches that are software-only switches (i.e., Virtual Dynamics paths and solo safe functions). There is something in SUPERTRUE's Virtual Dynamics called the G Page. Here you can set up macros to change the switch settings of an individual channel or groups of channels. You can set up a bank that will select channels 1-24 and place the Virtual Dynamics in either the channel or monitor path. This way, if you're using compression off of the top channels, during mixdown you can bring down the very same Virtual Dynamics compression settings in one shot. It's so convenient. All of my reverb returns are on the right side of the board, and on the G Page I can put all them into Solo Safe. This means that when I do Solo-In-Place, I don't kill my reverbs. **EQ**

Retail price is \$99,153 (48-input); \$106,016 (64-input); and \$114,352 (80-input). For more information, contact Amek at 10815 Burbank Blvd., North Hollywood, CA 91601. Tel: 818-508-9788. Circle EQ free lit. #150.

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The Future of Apple

Assuming, of course, that the venerable computer company has one

BY MARTIN POLON



The addition of the personal computer (PC) to the recording, editing, postproducing, and signal processing arsenal of the recording studio has taken place over the last ten years — until the point has been reached where a studio without a personal computer for audio work seems naked. No computer product has had more studio contact than the Macintosh computer from Apple, which some could say invented the PC audio category.

The month of January 1996 has seen a virtual firestorm explode around Apple Computer. Separating the reality of Apple from the perception based on both Wall Street and news media intolerance and prejudice against the Cupertino, CA personal-computer maker is very difficult because in the computer marketplace, the media is indeed the message. Decision makers who currently own Apple's Macintosh products and those contemplating new Macintosh purchases are supposedly — according to the news media — reexamining their commitment to the Macintosh platform.

Despite the extremely loyal nature of the Macintosh 20 million-plus user base, the perceived possibility of Apple's relative demise has forced those who have previously never ever contemplated having to use "Wintel"

(Microsoft Windows + Intel Pentium chips), to at least consider the unthinkable.

The reality of Apple Computer in 1996 is closer to the following points than the media and Wall Street currently would like to admit.

1. Wall Street and the press are finally "getting even" with the company. Many, if not all, of Apple's current problems have as much to do with the bad press and poor financial analysis directed at Apple as with actual per quarter performance.

2. Despite some well-publicized set-backs to initial software and hardware release time frames, Apple's technological progress has continued unabated. Forthcoming technologies such as imaging tools like 3D Quicktime and Quicktime VR, Internet utilities such as CyberDog, communications enablers such as Open Transport, the Open Doc software suite, and so on are all on-schedule and on-course.

3. With somewhere in the range of 22 to 24 million users committed more or less to the Macintosh platform, the reality of the size of the installed base indicates that someone is going to service those users with hardware and software; albeit perhaps not at the rate currently being provided by Apple. Apple is very unlikely to go out of business, though it may well be bought, sold, merged, and/or arbitrated.

4. The current presence of Power Computing Corp., Radius, UMAX Technologies, and Day Star Digital signifies the continued presence of Macintosh via these licensed clone makers — no matter what changes are made at Apple. Among other major personal computer makers previously committed to the IBM-PC platform, several such as Compaq Computer Corp., Dell, Gateway 2000, and Toshiba are expected by industry analysts to join the Macintosh platform clone family. This is expected to take place in mid-year with the introduction of PPCP machines (PPCP, formerly Converged Hardware Reference Platform and before that the PowerPC Reference Platform). These Apple ROM-less Macintosh units will be built using standardized parts and are based on the Apple-IBM-Motorola PowerPC chip.

5. The company's transition to the Power PC (PPC) chip set developed by Apple, IBM, and Motorola has been an overwhelming success, with successor chips approaching and exceeding 200 MHz slated for new Macintosh models. The similar introduction of PCI add-on slots and companion connection "bus" will create a significant solution for the problems facing the user base involved in the important areas of desktop publishing, audio, video, and graphics creation — but not in the short term. The lack of supporting third-party developers and product suppliers to utilize the PCI bus has left Apple's existing NuBus machines — such as the first generation Power PC 6100, 7100, and 8100 plus powerful 68040 units with DSP such as the 660AV and the 840AV — to carry the volume of these niche users. However, Digidesign has announced a PCI-slot device for 1996 that will bring the features of the Digidesign recording family to the PCI Macs. Opcode also has recording software available for PCI. The PCI standard is also used on state-of-the-art Windows PCs. Developers and suppliers are expected to legitimize the PCI standard within a short time.

What can the owner of a personal or project studio do to protect himself or herself from the vibrations shaking Apple and the rest of the personal computer industry?

1. Purchase any additional Apple computer needed now — not because of any fears about Apple's future, but because the coming of the new Macintosh specification will forever change the way we use our computers. The change will be for the better, but it will still be a change and the existing NuBus models will be discontinued.

2. If you do not have adequate documentation from Apple and from third-party publishers, obtain them as soon as possible. Documentation and books about discontinued machines may not be as easily obtained if Apple is acquired. It is interesting to note, however, that currently even Apple refers those looking for documentation on obsolete machines to a third-party vendor who reproduces and supplies them. Commercially published

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ALESIS

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ROLAND FIRST LOOK

continued from page 38

down mode). Both the EQ and faders use 24-bit resolution.

There are eight onboard snapshot memories that store all onboard mixer settings including internal routing and EQ. Furthermore, the mixer can be controlled by a MIDI sequencer for dynamic fader, pan, send, EQ, etc., automation. And speaking of MIDI, the VS-880 can serve as either a master or slave, and speaks MIDI Timecode and MIDI Machine Control. Through MIDI, you can even cascade two VS-880's together for 16 discrete and 128 virtual tracks.

One other nice touch: a footswitch input for no-hands control of recording functions.

All user interface functions are displayed through a custom LCD. Although not as graphic as a computer screen, there is more information than you'd get from a standard analog or digital tape recorder.

The VS8F-1 expansion board (\$395) plugs into the VS-880's expansion slot and provides two independent stereo multieffects processors.

These include 20 algorithms, 177 factory presets, and 200 user patches (stereo compressor/limiter, reverb, delay, stereo delay, chorus, stereo pitch shifter, delay and chorus, Roland Sound Space 3D sound, vocoder, rotary speaker, phase, flanger, gated reverb, multitap delay, etc.). For guitar players, there are several effects based on the Roland COSM technology used in the VG-8 guitar system for "plug and play" guitar effects. There are also built-in aux send/return jacks for adding outboard effects processing.

WILL IT BE A HIT?

Clearly, Roland has a lot of confidence in the VS-880. The preliminary reports are good: online comments are very favorable toward the VS-880, with the only negative remark being the lack of a video output for big-screen editing. Even so, the combination of features in a package this compact and affordable will undoubtedly bring the advantages of random-access, hard disk-based recording to a wider audience than ever.

EO

For more information, contact Roland at 7200 Dominion Circle, Los Angeles, CA 90040. Tel: 213-685-5141. Circle EQ free lit. #151.

FAST FORWARD

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computer books are subject to the same shelf life as any other book, and are usually seconded at a reduced price within six months to a year of being published and then disappear from bookstore shelves.

3. Have various upgrades that you have put off doing to your computers done now! Even if a computer company is charging ahead with no problems, old inventory of upgrade logic boards, level two cache memory, manufacturer specific memory boards and other similar accessories are subject to regular house cleaning. Never assume that a specific item will be held in virtual perpetuity by a computer maker.

4. If you utilize repair agreements, consider getting them from a national service vendor rather than through the manufacturer. In that way, you have hedged your bet no matter what happens.

5. Consider buying a needed new computer(s) from one of the Macintosh clone makers in order to try something different and obtain different features. Again, you hedge your bet.

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Console-tation

Nine steps to understanding your console's guts

BY EDDIE CILETTI



Perhaps the most understandable piece of analog audio gear is the recording console. Sans any digital accouterments, this bit o' technology is but a few simple circuits that are cut, copied, and pasted. Are you in the "do-it-yourself" mood? Great! Console repairs or upgrades need not be frightening. Let's take a closer look at what's involved.

(HINT: Each heading is a picture!)

1. An 8-pin op amp as viewed from the printed circuit board (PCB). The key component of any recording console is the operational amplifier (op amp). This fully functional audio building block is typically an integrated circuit (IC) that can be configured for voltage or current gain, can sum many channels, subtract noise, or shape the frequency spectrum. There are no opals that sound more like tubes or old Neves, but devices can be selected for performance-critical specs such as noise, output impedance and speed (the latter in volts per microsecond).

When attempting to troubleshoot, it helps to understand signal flow, but the process is most significantly enhanced by one thing: serviceability — the ability to painlessly remove modules and ICs. Assuming that the module is extractable, IC sockets can be retrofitted to facilitate service, future experimentation, and upgrades.

2. Removing the op amp using a soldering iron and a desoldering braid. The most practical way to remove electronic components is with a soldering iron and a desoldering braid such as Chem-Wik Lite. Place the braid between the iron and the work. Fresh solder, applied to a clean tip, will promote the flow of heat and greatly enhance the process. *Note: Do not use force, or circuit-trace damage will result!*

3. Loosening the op amp with a screwdriver. Once solder has been

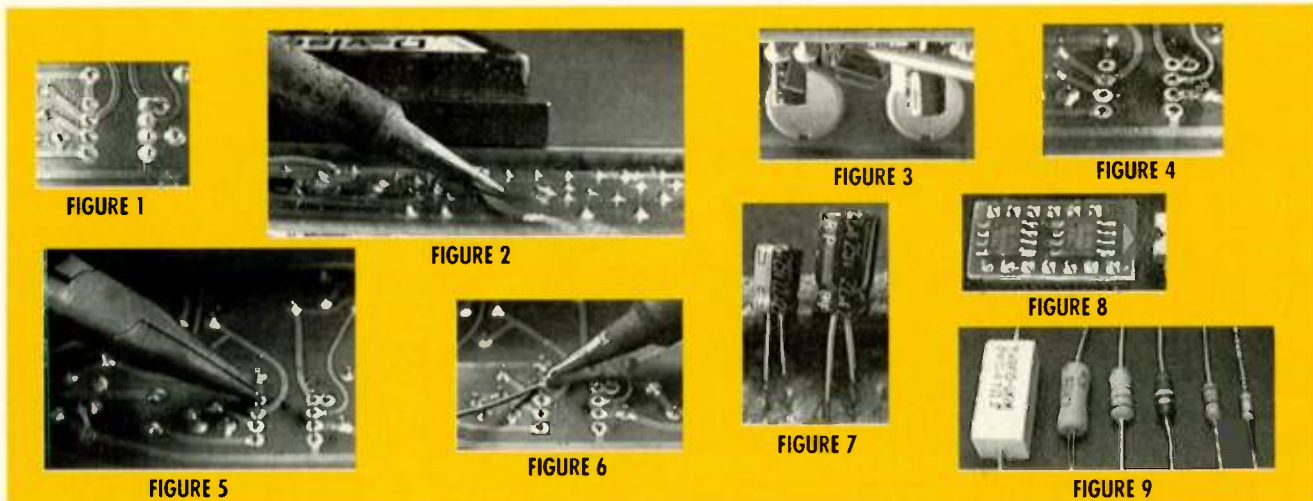
removed, check to see if any of the component's legs have been bent over. This is done to mechanically secure the part prior to soldering. Gently bend or pry the leg with needle-nosed pliers or a small flat-bladed screwdriver. On the flip side, a small screwdriver between the IC and the PCB will help pop the old device from its home. Extra care should be taken if the PCB is double-sided, as traces under the IC can be damaged. Again, do not use force.

In the picture, behind the two black capacitors, are two dull, metal circles. These are the rear of the potentiometers or pots. The square hole serves as the end stop and can also be used to apply spray cleaner/lubricants such as Caig's DeOxit. Exercise after spraying.

4. View of the PCB with the op amp removed. The residue left behind when using both solder and desoldering braid is called "flux." It is used to help the solder flow to the work. Flux can be removed with a toothbrush and anhydrous alcohol — the type used for cleaning tape heads.

5. Installing a socket. Sockets are primarily installed to protect the PCB from repeated soldering attacks. Heat combined with force can weaken the bond between the copper circuit trace and the board material. Loose pads — the holes at the end of a trace — should be gingerly treated and/or reinforced with light-gauge solid wire. BTW, the

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READER SURVEY

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pure music; open minds; freedom; and watching all the itty-bitty lights.

If you could participate in any recording session throughout history, which would it be? The Beatles *Sgt. Pepper* sessions [many votes]; Manhattan Transfer's *Vocalese* album; the premiere of Beethoven's 9th Symphony; Watergate; one of the early Blue Note sessions; any funk sessions with George Clinton producing; Bob Wills & the Texas Playboys with Wally Heider engineering; Benny Goodman, "Moonglow" (1937); "My Life in the Bush of Ghosts" with David Byrne and Brian Eno; Moody Blues with the London Philharmonic *Days of Future Passed*; Pink Floyd's *Dark Side of the Moon*; any Sex Pistols; any Phil Spector; and Patsy Cline; Steely Dan's *Royal Scam*; David Bowie's *Diamond Dogs*; and Tina Turner's *Private Dancer*.

Whose memoirs of the recording industry would you most like to read? George Martin [many votes]; Howard Roberts; George Clinton; Owen Bradley; Brian Eno; Bruce Swedien; Phil Ramone; Roger Nichols; Eddie Kramer; Brian Wilson; Paul McCartney; Keith Emerson; Spinal Tap; Phil Spector; Les Paul; Hans Zimmer; Jeff "Skunk" Baxter; and Glynn Johns.

What is the one new product you've been dying to try? Yamaha O2R console [many votes]; Apogee AD 1000 A/D converter; Digidesign's Pro Tools III; Porsche 993; Spectral Prisma Music; Roland JV-1080; DigiTech Studio Vocalist; Focusrite Red Series; Ensoniq DP-4; Electro-Voice RE-2000; Otari RADAR; Neve 9098; new cheese crust at Pizza Hut; Sony DPS-V77 processor; and the Peavey PVM-19000 microphone.

What is the strangest thing you've ever found stuffed into a speaker cabinet? A six-foot boa constrictor; a crossover hot-glued onto plywood; a cat (still alive); a drunken clubowner's head (skull attached); condoms; a bag of unopened Hot Chili Fritos, two day-glo condoms, and nail clippers — all in the same cabinet; a petrified McDonald's cheeseburger and a pair of black-leather thong panties — both in the same cabinet; Santaria candles; 20 lbs. of crab meat; cranberries; a dead rat; an accurate component; dirty laundry; and old underwear.

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notebook with integrated hard disk recording; an ADAT/BRC system that sounds like 2-inch and locks immediately; a recording studio that requires no cables; a breakout box with high-quality converters for a Power Mac, along with digital ins and outs; SCSI port from my brain to a CD-R recorder; headset for drummers that allows change in proximity; integrated mixing and signal processing with separate converters and control surfaces; insertable tube parametric EQs/limiters at an affordable price; double tracker that can double *before* as well as after the dry signal; software-based synth like the Kurzweil K2000 with external analog filters; automatic tuning device for guitar; and a mixing console with a built-in port-a-potty.

MULTIPLE CHOICE

The final section of the survey gave the option of choosing the best answer from a listing of four or so choices. And the winners are:


Who would you most like to work with: Phil Ramone will never have to work alone, capturing 52 percent of the votes. Right behind Phil is Quincy Jones, with 36 percent, and Phil Spector with 12 percent.

In the ongoing analog/digital debate, which do you favor? Apparently, analog vs. digital is not as hot a topic as we had thought, with 51 percent believing that both will work, and the remaining people being evenly distributed between both formats (about 25 percent each).

What is your favorite medium to record to? Again, analog and digital came out pretty evenly, with 40 percent using ADAT/D8 and another 40 percent using analog formats. Rounding out the back is DAT with 13 percent of the vote, hard disks with 4 percent, and DCC/MiniDisc with 3 percent.


WHAT IT ALL MEANS

The real result of this survey is that we, as editors, know how better to serve you, the readers. We know better where your interests lie, as well as what gear you want to see covered and what personalities should be placed on these pages. We've also had a bit of fun in having contact with you. And if there's any comments or requests you'd like to make, our e-mail is always open (EQMagazine@aol.com), as is our office (939 Port Washington Blvd., Port Washington, NY 11050).

So keep in touch — and keep your eyes peeled for the 1996 Reader's Survey. 

SOUNDCRAFT GHOST

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Comparisons to the Mackie are inevitable, and Ghost stacks up extremely favorably in the features game. However, it is more than a me-too product as it scores well over anything else in this class for implementation of MIDI. The Ghost has the clarity of operation that you would expect and the Soundcraft pedigree as far as the electronics go. I have to reserve judgement on just how well the whole package slots together in practical terms until I do a full review. Ghost should start shipping in March. Take note: there is a new kid on the block. 


Retail price is \$3950 (16-channel); \$4950 (24-channel); and \$5950 (32-channel). For more information, contact Soundcraft, 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-893-4351. Circle EQ free lit. #152.

TOAD'S PLACE

continued from page 100

very simple and basic because most engineers can walk in and understand our PM1800 very quickly. If you start to throw in more buttons and knobs, the less-experienced engineer is going to come in and have more trouble getting his job done.

One of the main reasons that Toad's Place is such a successful club is the caliber of acts that we deal with. A lot of times we have established arena acts that come back to the club scene and this is one of the places that they will play. We have had some of the best acts come through here and they can usually afford to pay very good engineers. So I have learned a lot of great tricks that way, and that's what it is always about — being able to learn from somebody better than yourself.

Toad's is a cool environment to work in, and I feel like I haven't really worked since 1989. I think that our major concern is always making sure that everyone has a good time. It's a nightclub and we're supposed to have fun here so that the band and the people who came to see that band want to come back again. That is the bottom line, and it's what has kept the place open for so long. 

Sound Advice

Rick Chertoff	Ray Benson
Joan Osborne	Ray Kennedy
William Wittman	Steve Earle
Too Much Joy	Willy DeVille
Cyndi Lauper	The Steve Miller Band
Butch Vig	Asleep At The Wheel
Soul Asylum	John Cale
Garbage	Freddy Johnston
John Siket	Audioforce
Sonic Youth	Millbrook Sound
The Dave Matthews Band	Bearsville Studios
Tom Jung	Justin Niebank
The Roches	Martin Brass
Boonehoft Vintage Rentals	Freddy Jones Band
Mark Egan	Stuart Sullivan
John Scofield	Bob Mould
Royaltone Studios	Appaloosa Sound
Stewart Lerman	Kevin Beamish
Joe Chiccarelli	Dave Thoenen
John Agnello	Bon Jovi

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MAINTENANCE

continued from page 128

greenish coating on the PCB permits the use of automated soldering "baths" while also serving to protect traces from accidental shorts and moisture.

Insert the new, preferably gold-plated socket and gently bend two diagonally opposed legs to hold it in place until soldered.

6. Soldering the socket. Notice that, in the picture, the soldering iron is on one side of the leg while the solder is applied to the opposite side. Start with a clean tip by dabbing it on a cellulose sponge dampened with water. Apply solder immediately afterwards. A small amount of "molten metal" facilitates the transfer of heat to the leg so that it becomes hot enough to melt the incoming solder. You are now free to experiment and swap ICs.

7. Two types of electrolytic capacitors. Electrolytic capacitors are most typically employed as a road-block to DC voltages that can result from failed opals. Cap failure most obviously reduces the low-frequency response. Both of these capacitors are 22 micro-Farads (μF or MF) @ 25 volts. Aside

from the physical difference, the one to the left is polarized (note the vertical stripe indicating the negative leg) while the one to the right in labeled "BP" (bipolar), meaning nonpolarized.

The values shown are typical values for input caps in medium impedance circuits. Larger values of capacitance (typically 100 μF) are used in low-impedance output circuitry. (Higher values of capacitance pass more low frequencies.) Standard electrolytic caps are primarily used to minimize interaction between stages and can pass audio. Bipolar caps are literally two devices in one package, an enhancement that improves waveform symmetry. For upgrades, see the Panasonic section of the Digi-Key catalog (800-344-4539).

8. Quad op amp upgrade. Up until this point, only the 8-pin, dual in-line package (DIP) of the IC is pictured. This package can hold either a single or dual op amp. There are also single in-line packages (SIP) and larger DIPs that can house four opals. Single and dual upgrades are easy to come by while quad op amp selection is somewhat limited.

To solve this problem, one entrepreneur mounted two high-performance Burr Brown OPA2604 dual opals on a plug-in PCB. This Bifet input, quad op amp assembly is a drop-in perfor-

mance upgrade for such standard parts as the TLO-84, TLO-74, LF-347, OPA-404, and the AD-713. It boasts low distortion, wide bandwidth, high-output current and a slew rate of 25 V/ μs .

For more information, contact Everett Carroll at Emc Engineering Services; Tel: 714-539-7887; E-mail: saxman@liberty.com.

9. Resistor assortment. While only one style of capacitor was shown, there are many styles of resistors to observe in this last picture. Unlike capacitors, which are graded in volts, resistors dissipate power in the form of heat and are rated in watts. From left to right, the power/composition options are: 5 W/wirewound, 3 W/ceramic, 1 W/metal oxide, 1/2 W/carbon, 1/4 W/carbon, and 1/4 W low-noise, metal film.

In sensitive, performance-critical circuitry, metal film resistors can make a significant difference. In addition, while standard resistors can have value tolerances (in ohms) of 3 percent to 10 percent, the metal film vary by only 1 percent. They are easily identified by their blue or green base color.

Wrap-up. In future articles I will show how to read component values and how to make component choices. Any Questions? Feel free to send e-mail to: eddieaudio@aol.com. **EQ**

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SHURE SM58

Unidirectional Dynamic Microphone



Consistently the choice of professional performers around the world, the SM58 is a rugged unidirectional dynamic mic with a highly effective built-in wind and pop filter. It's performance characteristics and compact size make it especially well-suited for music and speech applications - anytime the mic must be used outdoors or close to the mouth. A genuine world standard and audio legend, the SM58 makes all out vocalists sound their best.

- Self-contained spherical filter to control explosive breath sounds ("pop") and wind noise in outdoor locations
- Unusually effective cardioid pickup pattern to minimize background noise and undesirable effects of studio and location acoustics. Rear and side rejection uniform to very low frequencies and completely symmetrical about microphone axis
- Bright, clean sound. Especially good for vocal music, announcing, narration and dialogue
- Cartridge shock-mounted for protection and quiet operation
- Wind and "pop" filter removable for cleaning or replacement
- Versatility - designed for both field and studio use - hand-held or on a stand (slip-in swivel adapter included)

SM57

Unidirectional Dynamic Microphone



The classic SM57 is the "workhorse" mic of stages and studios worldwide. Its carefully contoured frequency response means clean, well-defined instrumental reproduction and rich, warm vocal pick-up on lecterns or stages. The SM57 is the standard for drum, percussion and instrument amplifier miking.

- Unusually effective cardioid pick-up pattern minimizes effects of studio or location acoustics and background noise. Rear and side rejection uniform to very low frequencies and completely symmetrical about microphone axis
- Bright, clean sound. Especially effective for announcing, narration and dialogue, vocal music, and rhythm packages
- Cartridge shock mounted for quiet operation
- Versatility - for use in the hand or on a stand - for use indoors or outdoors
- Microphone supplied with adjustable swivel adapter - permits tilting through 90° from vertical to horizontal

SENNHEISER

RF CONDENSER MICROPHONES

Unlike traditional condenser mics, the capacitive transducer in Sennheiser condenser mics is part of a tuned RF discriminator circuit. Its output is a relatively low impedance audio signal which allows further processing by conventional hi-z buffer low noise solid state circuits. They achieve a balanced floating output without the need for audio transformers, and ensure a fast, distortion-free response to audio transients over an extended frequency range.

MKH 20 P48U3 Omnidirectional

Low distortion push-pull element, transformerless RF condenser, flat frequency response, diffused near-field response switch (6 dB boost at 10 kHz), switchable 10 dB pad to prevent overmodulation. Handles 142 dB SPL. High output level. Ideal for concert, Mid-Side (M-S), acoustic strings, brass and wind instrument recording.

MKH 40 P48U3 Cardioid

Highly versatile, low distortion push-pull element, transformerless RF condenser, high output level, transparent response, switchable proximity equalization (-4 dB at 50 Hz) and pre-attenuation of 10 dB to prevent overmodulation. In vocal applications excellent results have been achieved with the use of a pop screen. Recommended for most situations, including digital recording, overdubbing vocals, percussive sound, acoustic guitars, piano, brass and string instruments, Mid-Side (M-S) stereo, and conventional X-Y stereo.

MKH 60 P48U3 Short Shotgun

Short interference tube RF condenser, lightweight metal alloy, transformerless, low noise, symmetrical capsule design, smooth off-axis frequency response, switchable low cut filter (-5 dB at 100 Hz), high frequency boost (+5 dB at 10 kHz) and 10 dB attenuation. Handles extremely high SPL (135 dB), ideal for broadcasting, film, video, sports recording, interviewing in crowded or noisy environments. Excellent for studio voiceovers.

MKH 70 P48U3 Shotgun

Extremely lightweight RF condenser, rugged, long shotgun low distortion push-pull element, transformerless, low noise, switchable presence (+5 dB at 10 kHz), low cut filter (-5 dB at 50 Hz) and 10 dB pre-attenuation. Handles 133 dB/C SPL, with excellent sensitivity and high output level. Ideal for video/film studios, theater, sporting events, and nature recordings.

TASCAM DA-88

Digital Multi-Track Recorder



The first thing you notice about the eight channel DA-88 is the size of the cassette - it's a small Hi-8mm video cassette. You'll also notice the recording time - up to 120 minutes. These are just two of the advantages of the DA-88's innovative use of 8mm technology.

- The ATF system ensures that there will be no tracking errors or loss of synchronization. The DA-88 doesn't even have (or need) a tracking adjustment. All eight tracks of audio are perfectly synchronized. What's more, this system guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks - whether you have one deck or sixteen (up to 128 tracks)
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48kHz (user selectable). The recording response is flat from 20Hz to 20kHz while the dynamic range exceeds 92dB. As you would expect from a CD-quality recorder, the wow and flutter is unmeasurable.

• One of the best features of the DA-88 is the ability to execute seamless Punch-ins and Punch-outs. This feature offers programable digital crossfade, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks, whether you want to generate special effects or compensate for poor timing. All of this can be performed easily on a deck that is simple and intuitive to use.

Fostex RD-8

Multi-Track Recorder



Fostex has long been a leader in synchronization, and the RD-8 redefines that commitment. With its built-in SMPTE / EBU reader/generator, the RD-8 can stripe, read and jam sync time code - even convert to MIDI time code. In a sync environment the RD-8 can be either Master or Slave. In a MIDI environment it will integrate seamlessly into the most complex project studio, allowing you complete transport control from within your MMC (MIDI Machine Control) compatible sequencer.

- Full transport control is available via the unit's industry-standard RS-422 port, providing full control right from your video bay. The RD-8 records at either 44.1 or 48kHz and will perform Pull-Up and Pull-Down functions for film/video transfers. The Track Slip feature helps maintain perfect sound-to-picture sync and the 8-Channel Optical Digital Interface keeps you in the digital domain.
- All of this contributes to the superb sound quality of the RD-8. The audio itself is processed by 16-bit digital-to-analog (D/A) analog-to-digital (A/D) and 64X oversampling, thus delivering CD-quality audio.
- The S-VHS transport in the RD-8 was selected because of its proven reliability, rugged construction and superb tape handling capabilities. Eight tracks on S-VHS tape allow much wider track widths than is possible on other digital tape recording formats.
- With its LCD and 10-digit display panel, the RD-8 is remarkably easy to control. You can readily access 100 locate points, and cross-tape time is fully controllable in machine to machine editing. Table of Contents data can be recorded on tape. When the next session begins, whether on your RD-8 or another, you just load the set up information from your tape and begin working. Since the RD-8 is fully ADAT compliant, your machine can play tapes made on other compatible machines, and can be controlled by other manufacturers ADAT controllers. Your tapes will also be playable on any other ADAT deck.

Roland DM-800

Digital Audio Workstation



The DM-800 is a compact, stand-alone multi-track disk recorder that provides an amazing array of features at an unbelievably low price. Whether for music production, post production or broadcast, the DM-800 will make your work simpler, faster, more productive and more profitable. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing, to track-bouncing, to final mixdown. It fully supports SMPTE and MIDI time codes and also features a built-in Sample Rate Resolver to synchronously lock to any time code.

- POWERFUL EDITING**
 - Time Compression, Pitch Compression
 - Completely Non-Destructive Cutting, Erasing, Copying
 - Very Fast Looping for Music or Ambiance Editing
 - Scrub Preview and Preview to, from and thru
 - Six Levels of Waveform Zoom for Fast Editing
 - Optional RS-422 Interface (D10-8000) for 9-pin Control from Video Editor
- FLEXIBLE I/O STRUCTURE**
 - Full Digital Patch Bay
 - Two Stereo Aux Returns
 - Digital Stereo Input and Two Digital Stereo Outputs
 - Four Balanced Analog Inputs with Gain Controls
 - Four Balanced Analog Outputs with Option for 4 More
- FULL AUTOMATION**
 - Dynamic and Snapshot Automation of Level, Pan, 2-Band EQ, including Frequency Select, Boost and Cut
 - Microscope Editing of Automation Data
 - Phase Level Editing of Level, Crossfade and Fade In/Out
- TRIGGER FEATURES:**
 - Trigger Mode to Play any Combination of 8 Tracks for Vocal Fly Ins or Sound Effects Placements
 - Advanced Trigger Mode for Live Operation with Preset or Dial up Cue of Phrases to be Played One after Another
- MIDI FEATURES:**
 - MIDI Machine Control
 - Internal Tempo Maps
 - Accurate Editing by Bars and Beats and Sub-Beats
 - MIDI Clock and Song Position Pointer Output
 - 8 MIDI Triggers for Instant Phrase Playback
 - MIDI Trigger of Record and Punch In/Out
 - Tempo Maps from External Sequences, MIDI or Tap Input.
- ACCURATE SYNCHRONIZATION**
 - Frame Accurate Sync to any Time Code
 - Locks to MTC
 - Generates and Reads all Types of SMPTE, including 24.25, 29.97 30 (Drop/non-drop) Frames per Second
 - Incoming SMPTE Reshaped to Output Jack
- RECORDING OPTIONS**
 - Records to Standard SCSI Drives
 - Up to 24 Hours Recording Time Possible
 - Uses Magneto Optical or Syquest Drives for Fast Project Changeovers
 - Optional Internal 2.5" Drives for Portable Operation
- PROJECT CATALOGING**
 - Up to 150 Projects on Line at Once
 - Easy Cataloging of Sound Effects and Projects
 - Easy Transfer of Sounds from One Project to Another
 - File Compatible with DM-80
- HIGH QUALITY SOUND**
 - Sampling Rates of 48, 44.1, 32 kHz
 - 18 Bit A/D and D/A with 128 and 8 Times Oversampling
 - 24 Bit Internal Processing
 - Superb Converters
- VIDEO OUT**
 - Composite, S-video, Digital RGB Output
 - All Track Overview with Infinite Level of Project Zoom
 - Views of Phrase and Waveform Editing
 - Very Accurate Level Meters
 - Track Status and Time Location

beyerdynamic

TG-X Dynamic Mic Series

The entire TG-X family of microphones is based on neodymium technology coupled with rugged construction and designed for optimum performance in a stage environment

TG-X 5

- Clip-on gooseneck drum mic with high SPL capability
- Acoustically coupled to capture shell sound as well as skin sound
- Internally shock mounted for isolation from mechanical noise
- Rugged construction with convenient clothes peg mounting



TG-X 30/35

- Ultra-slim flexible gooseneck for easy positioning
- Broadcast performance microphone with rugged construction
- Lightweight, low profile adjustable neckband
- Applications: Hands free vocals (drums/keyboards) and aerobics
- TGX 30.15 Omni neckwork with pre-amplifier
- TGX 30.16 Omni neckwork for wireless transmitter
- TGX 35.15 Cardioid neckwork with pre-amplifier
- TGX 30.16 Cardioid neckwork for wireless transmitter

TG-X 40

- Hypercardioid polar pattern with excellent isolation from unwanted sound
- Flat, wide range frequency response for uncolored sound reproduction
- Rugged construction
- Applications: Vocal piano, orchestral/recital recordings, strings and sampling



TG-X 50

- Hypercardioid kick-drum with high SPL capability
- Reduces shell ring in bass drum
- Exceptional gain-before-feedback
- Superb transient response and extended low frequency range
- Applications: Kick drum, floor toms, congas and timpani



TG-X 80

- High quality hypercardioid vocal mic
- Full range frequency response
- Studio quality accuracy
- Excellent off-axis isolation
- Shock absorbing rubber ring
- Applications: Vocals, piano, strings, brass, percussion, woodwind, overheads sampling

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TASCAM 103 Mastering Cassette Deck

Cost effective three head stereo mixdown cassette deck, appropriate for audio and video production facilities. With its three head design you can hear what is actually on the tape as it is recorded. Auto Monitor Function switches from playback to input automatically while in recordhouse mode, allowing you to set record levels or match tape levels. Dolby HX PRO circuitry provides extended high frequency performance while keeping distortion and noise to a minimum. Tape type is automatically sensed and adjusted for by the Auto Tape Selection feature.

102 Cassette Deck

Designed primarily for mixdown, the 102 provides solid performance and sound quality with durability and reliability. Although it is a two head unit, the 102 closely matches the performance and features of Tascam's 103 Mastering Deck.

202MKII Dual Recording Cassette Deck

Dual record cassette deck offers dubbing and copying capabilities at a reasonable price. The deck is capable of simultaneously making two identical recordings from the same source, or making a single extended recording first on one tape (both sides) then on the other (also both sides). Copying can be easily performed by using one side for playback and the other for record. Can also provide continuous background music, playing first both sides of one tape, then both of the other.

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SONY TCD-D10 PRO II Portable DAT Recorder

Packed with features and functions, the compact TCD-D10PROII is everything professionals need in a portable DAT recorder. Measuring only 10" x 2 1/2" x 7 1/2", it provides high performance, reliability and flexibility. Among its many features are high speed 100x search, LCD multi-function display, 4-motor Direct Drive transport mechanism and absolute time recording capability. With absolute time code, tapes recorded by the TCD-D10 PRO II can be used immediately as source material for the PCM-7000 Series Editing System. Offering maximum performance and capabilities in a minimum package, the TCD-D10 PRO II is the recorder of choice for any field application.



- Has balanced XLR input, switchable microphone (-60dB) or line (+4dB) inputs. A 12-pin digital connector provides interfacing with AES/EBU digital signals of 32, 44.1, or 48.0 kHz sampling rate. This means that compatibility with other digital systems is assured. It also provides the convenience of digital dubbing and editing without any degradation.
- Equipped with a comprehensive self-diagnostics function that constantly monitors the rotation of the head drum, capstan and reels. The tape transport mode and load/unload time are continuously checked as well. Upon detection of trouble, the tape is brought to a forced stop and unloaded automatically to protect the tape and the recorder.
- Up to 99 start IDs can be recorded in the subcode area. When the record button is pressed, the start ID is recorded automatically for 9 seconds. During recording, it can also be added manually to any position of the tape. Search for these start IDs is performed in two modes at 100 times normal speed.
- Offers a maximum spooling time of 140 x normal speed. A two hour tape can be rewound or fast forwarded in under a minute.
- 20-segment digital peak level meters include overload indicators. Closely tracks input signal for accurate level indications.
- During playback, the date and time of recording is displayed.
- Has a 5-segment battery indicator. The last segment blinks on and off, notifying you to change batteries.
- To eliminate distortion caused by unexpected peaks, the TCD-D10 PRO II incorporates a record-level limiter with a fast attack time of 300ms. The microphone attenuator prevents distortion by suppressing the signal level 20 dB.
- Immediate playback is possible through a built-in speaker.
- A wired remote controller is supplied to control the record, play, stop, and pause functions of the recorder. The top end of the controller is designed to accept a microphone holder. Two microphone stand screw adapters are also supplied.
- The supplied NF-22H rechargeable battery pack provides 1.5 hours of continuous operation. The optional NPA-010 battery adapter enables 1 hour of continuous operation on AA-size batteries. With the use of the supplied AC-98 AC power adapter, it can also be operated on 100-240 VAC, 50-60 Hz.

SONY PCM-2300/PCM-2700A DAT Recorders

The superb audio quality of digital recording and the convenience of DAT cassettes is not restricted to broadcasting and post-production applications. In fact, it is just as relevant to business and educational applications. To meet the requirements of all these sectors Sony offers the PCM-2300 and PCM-2700A DAT recorders. While both are perfect for simple recording and playback at recording studios, the PCM-2700A is also well suited for simple program transmission at broadcasting stations. Both feature exceptional sound quality, three sampling frequencies, absolute time recording, long record/playback time, alternative subcode recording and digital fader.

- THREE SAMPLING FREQUENCIES**
At normal tape speeds, either a 44.1 kHz or 48.0 kHz sampling frequency can be selected. When set to long play (LP) mode, they provide 12-bit non-linear digital recording at 32.0 kHz.
- PROFESSIONAL PERFORMANCE**
The servo system is completely controlled by carefully programmed software. This features sophisticated, smooth transport control, which optimizes tape handling and increases the search speed to approximately 150 times normal.
- Absolute time can be recorded in the subcode area of the DAT tape. DAT tape with absolute time is ideal for editing with the Sony PCM-7000 Series Editing System, as it translates A-time into SMPTE time code.
- DIGITAL FADER**
A 64-step digital fader is incorporated in both units. Both fade-in and fade-out functions are available on the digital and analog inputs/outputs. The fade duration can be set over from 0.2 - 15 seconds, and can be controlled either locally or by the remote.

- PCM-2300 AND PCM-2700A**
The PCM-2300 has unbalanced digital input/output, while the PCM-2700A has dual digital inputs/outputs (balanced and unbalanced), allowing most digital audio equipment to be directly connected. Both also have balanced analog line level inputs/outputs which can be adjusted over a range of -12 dBs to +8 dBs, for connection to many other types of audio equipment.
- The PCM-2300 has a reliable tape transport system driven by three servo-controlled motors, two direct-drive types for head drum and capstan, and a single DC motor for the reels.
- The PCM-2700A employs a four motor direct-drive tape transport with head drum, capstan and reels, all individually driven by servo-controlled motors. The four motor direct-drive mechanism gives even more precise and stable transport.
- PCM-2300 front panel display has a 20-segment peak level meter display with 0.5 dB step peak margin. The PCM-2700A has a 29-segment peak level meter with a 0.1dB step peak margin indication.



- SUBCODES**
They record various subcodes separately from the audio data to provide tape search functions. The subcodes include the Start ID, Skip ID, End ID, Program Numbers, Absolute Time, and Date functions. Program numbers can be recorded sequentially as the Start IDs and are written (and can be renumbered) in the correct sequence whenever additional Start IDs are inserted.
- OTHER FEATURES**
They operate in the Long Play (LP) mode, yielding twice the normal record/playback time. This also makes them compatible with the LP mode of consumer products. In LP mode, a maximum of four hours of recording and playback is possible.
- Built-in crystal clock generates a date function, which automatically indexes each recording with time and date info (minute/hour/day of the week/month/year). When tape is replayed it's easily checked for when the recording was made.
- Both units can be installed in a standard 19-inch rack.
- Both included a wireless remote control for remote operation.

- PCM-2700A ONLY FEATURES**
Read After Write function allows you to monitor the recorded signal immediately after it has been stored on the tape. This saves you valuable time, as recorded signal can be checked monitored in real time.
- When manually writing the Start, Skip, and End IDs, there is a high resolution of 1 second by entering the absolute time address via keys on the front panel.
- Convenient remote operation is performed by the optional RM-D7100 Remote Controller. Connected via the 37-pin parallel remote connector, it allows basic tape transport control.
- Has 8-pin remote interface to give a fader start function, which is particularly useful for On-Air applications.
- When manually writing the Start, Skip, and End IDs, there is an enhanced rehearsal function which is available for accurate ID recording. While monitoring the ID recording, these can be relocated forwards or backwards in 0.3 second steps.

TASCAM DA-P1 Portable DAT Recorder

- With rotary two head design and two direct drive motors the DA-P1 offers one of the best transports in its class.
- XLR-balanced microphone inputs (with phantom power) accept a broad range of signal levels from -60dB to +4dB.
- Analog line inputs and outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enables direct digital transferring.
- Uses next generation A/D and D/A converters to deliver amazing sound quality.
- Supports multiple sample rates (48, 44.1 and 32 kHz) and SCMS-free recording.
- Included in its design is a MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- To monitor your sound there is a TRS jack and level control for use with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. The DA-P1 includes a shoulder belt, AC adapter and one battery.



SONY TCD-D7 DAT Walkman Player/Recorder

- High-quality Standard Play (SP) mode provides up to two hours recording of 16-bit digital audio on a DT-120 DAT cassette. The SP mode is ideal for recording live music.
- Long Play (LP) mode allows up to 4 hours of record/playback of 12-bit audio on a single DAT cassette. The LP mode is ideal for meetings, conferences or other voice recordings.
- Equipped with digital coaxial and optical input connector. Maintains highest signal purity for recording and playback of digital sources with all information retained in digital format sources without external adapters.
- High-speed Automatic Music Sensor (AMS) search function finds and plays tracks, skips forward or back up to 99 tracks, all at 100x normal speed.
- Has a Digital Volume Limiter System (DVLS) that increases listening comfort and sound quality by automatically adjusting for sudden level changes of the recording. It also helps prevent sound leaks through headphones.
- Two-speed cue review lets you hear sound while player is in fast-wind modes, up to 3x or 25x normal speed.
- Compact and portable, it has an anti-shock mechanism that permits accurate recording and playback even while in motion.
- LCD display with backlight windows clearly shows recording level, track number, operating status and 4-segment battery indicator, even in low ambient light conditions.
- Optional RM-D3K System Adapter Kit for complete digital interface. The kit is equipped with the input/output connectors for both the optical cable and the coaxial cable. Therefore you can use it as a relay between the TCD-D7 and other digital equipment. Also includes a wireless remote control.



AMPEX PROFESSIONAL AUDIO TAPE



467 DAT Tapes			
467-R015P	4.19	467-R030P	5.09
467-R046P	5.79	467-R060P	6.49
467-R090P	7.79	467-R120P	9.29
467 Digital Audio Mastering Tape			
467-12TJ1J	4 x 4600 10" NAB Reel		64.49
467-27TJ1J	4 x 4600 10 1/2" Heavy Duty Precision Reel		79.95
467-57G111	1 x 4600 10 1/2" Heavy Duty Precision Reel		149.95
489 X Digital Mastering Tape Audio			
DM810AD	5 1/2 x 810 Gray Library Box		8.99
DM810DC	5 1/2 x 810 Clear Sleeve		8.09
456 Studio Mastering Tape			
456-151111	4 x 1200 7" Plastic Reel		7.19
456-173111	4 x 2500 10" NAB Reel		18.99
456-272111	4 x 2500 Plastic Hub		26.99
456-273111	4 x 2500 10" NAB Reel		33.99
456-572111	1 x 2500 Plastic Hub		32.99
456-573111	1 x 2500 10" NAB Reel		58.49
456-976111	2 x 2500 10" PREC		125.99
499 Grand Master Gold Studio Mastering Tape			
499-174111	4 x 2500 10" NAB Reel		20.49
499-274111	4 x 2500 10" NAB Reel		37.49
499-974111	2 x 2500 10" PREC		134.99

Panasonic SV-3700/SV-4100 Professional DAT Player/Recorders



Panasonic's SV-3700 and SV-4100 are designed for professional applications. They have highly accurate and reliable transport systems with search speeds up to 400 times normal play speed. They also feature advanced, high-quality analog-to-digital (A-D) and digital-to-analog (D-A) converters and input/output circuitry designed to interface with the widest variety of devices.

- SV-3700 Features:**
 - When recording via the analog inputs, a front panel switch permits selection of the sampling rate (44.1kHz or 48kHz). This provides the need for a conversion of the sampling frequency in CD mastering applications. When recording through the digital inputs, it automatically clocks to incoming frequencies of 32kHz, 44.1kHz or 48kHz.
 - Ramped record mute and unmute with three seconds fade-in and five seconds fade-out provides automatic level changes at the start and end of a recording.
 - High speed transport enables searching up to 250x normal speed. High-speed search up to 400x normal speed is possible once the tape has been scanned in Play, Fast-Forward or Reverse mode. The ensures access to any point on a two-hour DAT in approximately 27 seconds.
- Built-in shuttle wheel has two variable speed ranges: 3 to 15x normal speed in Play mode and 1/2 to 3x normal speed in Pause mode - an ideal way to find tape locations.
- Comprehensive display includes program numbers, absolute time, program time, remaining time and Table of Contents, which displays total recorded time and total PWO count for commercial prerecorded DAT tapes.
- Has XLR-balanced and unbalanced (phono) digital inputs and outputs. They provide direct interfacing with compact disc player, digital audio workstations and other components in a recording studio or production facility. Also has XLR-balanced analog stereo inputs and outputs. Output level is selectable between +4dB and -10dB. The input level is +4dB.

SV-4100 Has All the Features of the SV-3700 PLUS:

- Offers enhanced performance required for professional production, broadcast and live sound systems. Features such as instant start, external sync capability, enhanced system diagnostics, additional digital interfaces and exceptional 20-bit audio make the SV-4100 the DAT quality standard.
- QUICK START WITH TRIM AND REHEARSAL**
With 8MB of memory holding five seconds of audio data, the Quick Start function provides sound almost instantly after a play command is executed. Other DAT recorders lag about 7 seconds, making them unsuitable for professional applications.
- Easily adjust the Quick Start position and specify it by A-Time, Start ID or PWO. Recording via Quick Start is also possible allowing two SV-4100s to be used for frame-accurate punch-in/punch-out and assemble editing.
- You can adjust the Quick Start position with I-frame resolution over a range of ±50 frames. Using the shuttle dial and Skip key for adjustment. Frame number is preceded by + or - sign. A-Time, subcodes and peak level are displayed: to provide a general guide to positioning.
- Without playing the tape, you can monitor the level of stored data to check your Quick Start position. This preview capability is handy before actual editing or on-air play. Repeated play is also possible, using about 1.5 seconds of the data to create a kind of sampler effect.
- FRAME ACCURATE INDEXING AND EDITING**
Using the trim and rehearsal functions, you can accurately determine points to write start and skip IDs. These IDs can be written, rewritten or erased at any point in the recording and automatically renumbered.
- With two SV-4100s connected via the 8-pin parallel remote terminal, synchronized frame-accurate editing can be performed. Continuity of edit points can be checked by rehearsal playback. By entering and editing end position in one of the Locate buttons, you can determine a punch-out point as well.
- FLEXIBLE SEARCH**
Easily and accurately access your A-Time. You can specify hour, minute, second and frame.
- In most modes, the currently displayed A-Time can be assigned to one of the Locate buttons. Then from Stop, Pause or Play you can rapidly cue to any of these addresses by pressing its Locate key. In addition, Locate Last takes you to the most recent Quick Start A-Time position.
- Search is also possible by Start ID or program number.
- 5-MODE EXTERNAL SYNC**
Has 5 external sync modes. External sync is essential for applications such as post-production and stereo submix recording. It assures uniformity of timing between different equipment so the audio data consistently matches up with the target media.
- Select from 3 video external sync modes (25, 29.97 and 30 frames per second) or use the word sync or Digital Data modes (which lock to the input sampling frequency).
- ENHANCED SOUND**
The SV-4100 satisfies the highest professional expectations both in terms of sound and functionality. It features new 20-bit (equivalent resolution) digital-to-analog converters.
- MULTIPLE DIGITAL INTERFACES**
Has XLR-balanced digital input and output plus unbalanced digital coaxial and optical inputs and outputs. Analog inputs/outputs are XLR-balanced and output level is switchable between +4dB and -10dB, providing compatibility with other equipment.
- 3-WAY REMOTE CONTROL**
GPI input allows simple triggering of Quick-Start Play. 8-pin parallel remote terminal connects to another DAT deck, computer or wired remote. Includes wireless remote control.

JVC XD-P1 Pro Portable DAT Recorder

- An integrated package, the XD-P1 Recorder and a microphone with digital output in an unbelievable light package.
- Records and plays at all three standard sampling frequencies. Choose from 32kHz for long recording sessions, 44.1 kHz for mastering if CD production or 48kHz for highest fidelity.
- Operates without the intricacies of SCMS (Serial Copy Management System), permitting one generation of digital to digital copy, using 44.1 kHz sampling frequency. You can digitally dub or copy a recording made on the XD-P1 Pro as many times as necessary.
- The supplied detachable digital output microphone provides two pick-up patterns, "Telephonic" and "Stereo". A collapsible microphone stand is also supplied, allowing you to set the mic on a desktop for the interviews or conferences.
- Extensive use of aluminum and ultra-thin molding techniques make the XD-P1 Pro compact, lightweight and durable. The main module weighs under a pound (12.5 oz) with microphone and battery it weighs only 22 oz.
- All basic controls are on one side of the unit and readily accessible. You can operate the recorder using one hand.
- Advanced power-saving design and low power-consumption circuits give the XD-P1 Pro long recording capability - on a single battery charge. Optional rechargeable batteries further extend recording time.
- Supplied AC adapter/charger works anywhere in the world regardless of voltage or frequency.



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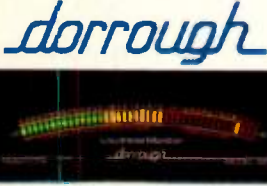
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samick

MM Series
MM842/1242/1642/2242
8/12/16/24 Channel Modular Mixers



- Electronically balanced XLR inputs
- Channel gain trim LED headroom indicator
- 3-band active EQ, sweep mid-band
- Individual channel inserts for patching
- Direct outputs on each channel
- Assignable bar graph level indicator for left and right or group outputs
- XLR and 1/4" balanced outputs
- +48v phantom power



With today's audio systems stretching the limits of program dynamics it's becoming critical for engineers to obtain maximum loudness with the minimum of distortion components, to fully utilize the dynamic range available. It is of equal importance that they have a method of monitoring and establishing the maximum safe level at which a system can operate.

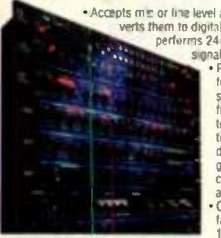
That's why every Dorrrough Audio Level Meter simultaneously shows 3 dimensions of program material content: Peak, Average Power and Compression are displayed on a color-coded 40-segment LED scale. Meters are easily viewed while providing precision indications of program energy content.

Loudness Meter Model 40-A
 The model 40-A has a scale allowing 14dB of headroom in 1dB steps. A stand-alone unit, it measures 8" x 24" x 6 1/2" and has an internal power supply. Model 40-AP has a peak-hold option as well.

Loudness Meter Model 40-B
 The Model 40-B provides metering of relative loudness to peak modulation. The 40-B is a scale differentiation of the 40-A and is calibrated in percent (% modulation), with the lower scale in dB from +3 dB to -3 dB. The 40-AP also has a peak-hold option.

Symetrix

Signal Processing Products
601 Digital Voice Processor



- Accepts mic or line level analog signals, converts them to digital (18 bits) and then performs 24-bit digital domain signal processing.
- Processing includes fully parametric EQ, shelving EQ, notch filtering, dynamic filtering (noise reduction), de-essing, delay chorusing, gating, expansion, compression, AGC and DC removal.
- Combination of 128 factory presets and 128 non-volatile user programs guarantee predictable and repeatable effects from session to session, performance to performance.
- Has XLR-balanced (analog) mono/stereo mic and line inputs and XLR-balanced stereo output, XLR balanced and S/PDIF (RCA) inputs and outputs. MIDI input/output supports connection to virtually any type of MIDI control device for programming or controlling the 601 in real time.
- Ideal for a variety of recording, broadcast, live sound, and post production applications.

488 Dyna-Squeeze
8-Channel Compressor/Interface

- Can easily increase average recording levels on your digital or analog tape recorder by 12dB with no side effects
- Tracks processed by Dyna-Squeeze have presence and increased articulation. Subtle sounds become more up front.
- Many professional mixing consoles have output levels that are much hotter than digital recorder inputs. The 488 matches any console to most any digital recorder.

We are a full stocking dealer for the entire Symetrix line

TASCAM M-2600 Series 16/24/32 Channel Eight Channel Mixers

- Combining completely redesigned, low noise circuitry with Absolute Sound Transparency™ the M-2600 delivers high-quality extremely clean sound. No matter how many times your signal goes through the M-2600, it won't be colored or altered. The signal remains as close to the original as possible. The only coloring you hear is what you add with creative EQ and your outboard signal processing gear.
- Double reinforced grounding system eliminates any hum. World-class power supply provides higher voltage output for better headroom and higher S/N ratio.
- **PREMIUM QUALITY MIC PRE-AMPS**
 The M-2600's mic pre-amps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. This lowers distortion and widens dynamic range. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel.
- The M-2600 accepts balanced or unbalanced 1/4" inputs and low-impedance XLR jacks. Better still, the TRIM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the -20 dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug anything in - keyboards, guitars, basses, active or passive microphones, samplers and more. No matter what you put into it, you can be confident that signal can be placed at optimum levels without a lot of fuss.



- **FLEXIBLE EQ SECTION**
 You'll find both shelving and split-EQ sections on some mid-level consoles. But that's where the similarities with the M-2600 end. The M-2600's bi-directional split EQ means you can use either or both EQ sections in the Monitor or Channel path, or defeat the effect altogether with one bypass button. Most other comparably-priced mixers will lock the shelving mix into the Monitor path only, limiting your EQ application.
- **ADVANCED SIGNAL ROUTING OPTIONS**
 Direct channel input switching. Assign to one of eight busses, or direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching. You won't find this kind of speed or flexibility in a "one-size-fits-all" board.
- **ERGONOMIC DESIGN**
 The M-2600 has a big studio feel. All buttons are tightly spring loaded, lock into place with confidence and are large enough to accommodate even the biggest fingers. The faders and knobs have a tight, smooth "responsive" feel and are easy to see, easy to reach and a pleasure to manipulate. Center detents assure zero positions for EQ and PAN knobs. Smooth long throw 100mm faders glide nicely yet still confidently allow you to position them securely without fear of accidentally slipping to another position.

THE BEST AUX SECTION IN THE BUSINESS
 The most versatile AUX section in its class, rivaling expensive high-end consoles. 8 sends total, 2 in stereo. Send signal in stereo or mono, pre- or post-fader. Available all at once. Return signal through any of 6 stereo paths.

MACKIE MICRO SERIES 1202 12-Channel Ultra-Compact Mic/Line Mixer

Usually the performance and durability of smaller mixers drops in direct proportion to their price. Fortunately, Mackie's traditional approach to pro sound engineering has resulted in the Micro Series 1202, an affordable small mixer with studio specifications and rugged construction. The 1202 is a no-compromise, professional quality ultra-compact mixer designed for professional duty in broadcast studios, permanent PA applications and editing suites where nothing must ever go wrong.



- Working S/N ratio of 90dB, distortion below 0.025% across the entire audio spectrum, switchable +48 volt phantom power and +28 dBu balanced line drivers
- Real switchable phantom powered mic inputs with discrete, balanced mic preamps as good as those found in big consoles
- Has 4 mono channels, each with discrete front end mic pre-amplifier and four stereo channels, each with separate left and right line inputs
- Every input channel has a gain control with unity at the center detent for easy setup. Also a pan pot, low frequency EQ at 80Hz, high frequency EQ at 12.5 KHz, and two aux sends with up to 20dB available gain.
- Main outputs operate either balanced/unbalanced, as required.
- Switchable three-way 12 LED peak meter displays.

- Master section includes two stereo aux returns, a separate headroom level control, metering and two stereo aux returns
- Line inputs and outputs are designed to work with any line level from instrument level, to semi-pro -10dB, to professional +4dB
- **HEAVY DUTY CONSTRUCTION**
 Designed for non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio station, etc.
- Sealed rotary controls instead of open frame phenolic potentiometers that suffer from dust and contamination
- Has steel chassis, rugged fiberglass circuit boards and a built-in power supply. Also has exceptional RF protection.
- **MULTIPLE APPLICATIONS**
 Ideal "entry level" mixer for those just starting a MIDI suite
 Ideal as headphone or cue mixer, level matching pro audio "look" kit, drum or effects sends submixer, 8-track monitor mixer.

CR-1604 16-Channel Mic-Line Mixer

The hands-down choice for major touring groups and studio session players, as well as for broadcast, sound contracting and recording studio users, the Mackie CR-1604 is the industry standard for compact 16-channel mixers. The CR-1604 offers features, specs, and day-in-day-out reliability that rival far larger boards. It features 24 usable line inputs with special headroom/ultra-low noise Unityplus circuitry, seven AUX sends, 3-band equalization, constant power pan controls, 10-segment LED output metering, discrete front end phantom-powered mic inputs and much more.



- **LOWEST NOISE, HIGHEST HEADROOM**
 With the CR-1604, having the lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range) at the same time are not mutually exclusive. It is free of commonly encountered headroom restrictions, and is able to handle the occasional pegged input with ease. In fact, many drummers consider it the only mixer capable of handling the attack and transients of acoustic and electronic drums.
- **CONSTANT POWER PAN POTS**
 Only with constant power pan pots will a source panned hard left or hard right have the same loudness as when it is sitting dead center. While most small mixers pass simple balance control for pan pots, the CR-1604's carefully optimized constant power pan circuitry make it a professional tool with the kind of performance necessary for CD mastering, video post and other critical audio production.
- **IN-PLACE STEREO SOLO**
 Stereo "in place" solo allows not only the monitoring of level and EQ, but also stereo perspective. Usually found in very expensive mixers, stereo solo allows you to critically scrutinize and carefully build mixes using all the channels with their respective sends and AUX returns.
- **UNITYPLUS GAIN STRUCTURE**
 Proper gain settings are facilitated by proper gain labeling, along with center-click detents on the faders, clearly understandable input trim controls and output meters that read channel levels in solo mode. With properly set levels you achieve very high headroom and low noise at the same time.
- **EFFECTS SEND WITH GAIN**
 Unusual circuit design that provides two different "zones" that reflect real world use. Send from each channel can vary in level from off to unity gain, which is the normal range of effects from other mixers. Since you also get another whole zone from the center detent to +15 dB of gain, the channel fader can be pulled down and the effects send can be boosted above unity when more effect is needed.

- **INTELLIGENT EQ POINTS**
 Low frequency EQ is at 80 Hz where it has more depth and less hollow midbass "bunk". Midrange is centered at 2.5 KHz, providing for more control of vocal and instrumental harmonics. A specially-shaped HF curve that shelves at 12 KHz creates more sizzle and less aural fatigue.
- **REAL MIC PREAMPS**
 The CR-1604 has genuine studio-grade phantom powered, balanced input mic preamps on channels 1 through 6. All CR-1604 (and XLR10) discrete input, mic preamp stages incorporate four conjugate-pair, large-emitter geometry transistors just like the big mixers use. So, when recording nature sound effects to heavy metal or mixing flutes or kick drums, you get the quietest, cleanest results possible.
- **BUILT TO LAST**
 The CR-1604 is designed for non-stop, 24-hours-a-day professional duty - even for tours that log 100,000 miles in three months. It has sealed rotary potentiometers that are resistant to airborne contamination like dust, smoke, liquids, and even the oxidizing effects of air itself!
- **Optional Accessories**
 OTTO-1604
 Add sophisticated computer controlled automation to your CR-1604. When connected to the MIDI port of your computer (PC, Mac, Amiga or Atari), each one of the 16 input channels can be programmed to change gain or to mute, just as you would program a sequencer. Master levels can be programmed as well, along with all buss channels.

While the standard CR-1604 comes with 6 high performance mic inputs, there are times when you need more. Enter the XLR10. This simple-to-install accessory adds 10 more (for a total of 16) mic inputs, with the same quality, performance and features as those in the CR-1604.

SENNHEISER

Incorporating state-of-the-art technology and decades of experience, Sennheiser headphones offer outstanding design, superb audio quality and luxurious comfort. From the ear padding to the O.F.C. (Oxygen Free Copper) cable, all materials are carefully selected and precision engineered to ensure incomparable quality.

HD414 Classic

A re-issue of the world's first open-Air dynamic headphone, the HD414 Classic offers maximum transparency, fidelity and comfort. A limited edition model, the HD414 Classic also features Professor Sennheiser's signature on the headband.

- Radial based diaphragms for more accurate reproduction
- Field replaceable parts for long-term enjoyment
- Neodymium-ferrous magnets for broad frequency response (18-21,000Hz)
- 10ft. Kevlar-reinforced oxygen-free copper signal cable with 1/8"-1/4" stereo phone plug.



\$59.95

HD25 SP Studio Monitor Headphone

Offering dramatic isolation from external sounds, the HD25SP is designed for professionals who rely on studio monitor headphones for work and pleasure.

- High-efficiency drivers for portable and field use
- Modular parts for long term value and durability
- Neodymium-ferrous magnets for broad frequency response
- Frequency Response: 16-22,000Hz
- Sensitivity: 105dB
- Impedance: 70ohm



\$119.95

HD265 Studio Monitor Sealed Headphone

Designed to meet the stringent demands of studio professional and audiophile alike, the HD265 breaks new ground in the sealed-chamber headphone format.

- Sealed-chamber headphone format
- Triple-wound aluminum voice coils for quick transients
- Polycarbonate dome-damping minimizes distortion
- Oxygen-free copper signal cable with 1/8" to 1/4" stereo phone plug
- Frequency Response: 10-25,000Hz

\$199.95

HD535 Dynamic Hi-Fi Stereo Headphone

The HD535's earcups surround your ears rather than resting on them, for a more natural listening experience.

- Open-back construction and classic design
- Light aluminum coils in the transducer systems offers excellent transient and dynamic response
- Supported by the open structure, tonal quality develops high dimensional sound qualities
- Circumaural, oval earpads for good wearing comfort
- Can be connected to all digital and analogue Hi-Fi components



\$139.95

HD545 Digitally Compatible Circumaural Headphone

The HD545 is the headphone to which all in its price category must be compared.

- Polycarbonate dome-damping materials for clearer highs
- Triple-wound aluminum voice coils mean powerful bass, high output and greater durability
- Velvety soft, circumaural earpads and adjustable, padded headband for extended comfort and perfect fit
- Oxygen-free copper signal cable assures optimal signal transfer
- Includes 1/8" to 1/4" stereo phone plug

\$169.95

HD565 Digitally Compatible Circumaural Headphone

Offering natural sound reproduction without tonal distortion - the choice for use with the most sophisticated equipment.

- Silk dome-damping for brilliant highs and ultra-smooth midrange reproduction
- Copper-coated aluminum voice coils for high linearity
- Bass-tube tuning for extended, powerful low frequencies
- Velvet ear cushions provide lavish comfort
- Oxygen free copper signal cable with 1/8" to 1/4" stereo phone plug.

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Stewart PA1000/1400/1800 Power Amplifiers



- High frequency switch mode power supply fully charges 120,000 times per second (1000 times faster than conventional power supplies) requiring far less capacitance for filtering and storage.
- High speed recharging also reduces power supply "sagging" that afflicts other designs.
- Incredibly efficient, 5 PA-1000 or PA-1400's (4 PA-1800's) can be run on one standard 20 amp circuit. There is no need for staggered turn-on configurations or other preventive measures when using multiple amp sets-up. Current drain during turn-on is only 6 amps per unit.
- They produce smooth and uncolored sound, while offering very full detailed low end response and tons of horsepower.
- They each carry a 5 year warranty on parts and labor.

PA-1000 weighs 9 lbs, is 15" deep and occupies one standard rack space. Delivers 1000 watts into 4Ω when bridged to mono.
PA-1400 weighs 16 lbs, is 15" deep and takes 2 standard rack spaces. Delivers 1400 watts into 4Ω when bridged to mono.
PA-1800 weighs 17 lbs, is 17" deep and takes two rack spaces. Delivers 1800 watts into 4Ω when bridged to mono.

B&H Performance Series Amplifiers



Performance Series 1 300 Watt Power Amplifier

- Measuring only 3.5 inches high and weighing 26 pounds, the Series 1 delivers more than 150 watts per channel.
- Its welded steel chassis is unbelievably strong while a custom heat sink extension provides exceptional thermal capacity.
- An internal fan provides quiet background noise levels for critical monitoring applications and when pushed hard the cooling system insures continuous cool operation even in the most demanding situations.
- Active balanced inputs with both XLR and 1/4" phone jacks.
- Supplied with quality 5-way binding posts for highly reliable speaker connection.
- Front panel handles are reversible for either rack mount installation or easy handling.
- LEDs are provided for signal presence and clip indication. The detented gain controls have large knobs for easy front panel adjustments.

Performance Series 2 600-Watt Power Amplifier

- Same as above except the Series 2 weighs 37 pounds and delivers more than 300 watts per channel.

Performance Series 4 1200-Watt Power Amplifier

- Same as above except the Series 4 weighs 53 pounds and delivers more than 600 watts per channel.
- Has a switch selectable clipping eliminator that prevents damage to the speakers.

TANNOY

System 6 NFM II

A 6.5 inch Dual Concentric with Tullip HF wave guide forms the heart of the System 6 NFM II providing a reference single point source monitor in a more compact enclosure than ever before. Every aspect of design fully complements the drive unit's capability. The rigid cabinet with carefully contoured baffle and trim minimizes diffraction and the high quality minimalist DMT crossover and gold-plated Bi-Wire terminal panel optimize the signal path. Pin-point stereo accuracy with wide frequency response, good power handling and sensitivity make this an ideal nearfield monitor.



PBM Series II Reference Monitors

The PBM II Series is the industry standard for reference monitors. They feature advanced technologies such as variable thickness injection molded cones with nitrile rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected inductors. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability and most important, real world accuracy.

PBM 5 II

- Custom 5" injection-molded bass driver with a nitrile rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- Woofer blends seamlessly with the "x" polyimide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring.
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density medite for minimal resonance and features an anti-diffraction radiused front baffle design.



PBM 8 II

- High tech 1" soft dome tweeter with unmatched point control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors, and components available.
- Full cross-braced matrix medite structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities.

PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" lowfrequency driver and 3/4" tweeter are led by a completely redesigned hardware hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radiused and ported cabinet design reduces resonance and diffraction while providing deep near extended bass.



TURTLE BEACH SYSTEMS

Turtle Beach audio cards bring true studio performance to the PC platform. Based on the technology used in their professional products, the performance of both their hardware and software has garnered accolades from users and press alike. Unlike other PC-based audio cards, Turtle Beach products are not emulated for sound card game compatibility. Instead, the design philosophy is to give the best possible performance and quality, in the Windows operating environment, while bypassing traditional PC limitations.

MULTISOUND MONTEREY Multimedia Sound Card

The next generation of Turtle Beach's award winning Multisound board, Monterey offers high quality performance and features at a very reasonable price. Multisound's Hurricane technology provides very high speed audio data transfer between the card and the hard drive. This approach allows for data throughput up to eight times faster than the more common DMA designs, while putting minimum burden on the CPU (critical if you're recording audio and video simultaneously).

- The Motorola DSP-56001 Digital Signal Processor operates at 20MIPS and performs all digitization functions with very low system overhead.
- High SNR (-85dB). A weighted THD, <0.01% THD, <0.01% IM - both A weighted, flat frequency response (DC-19KHz @ 5dB).
- On-board real-time effects processor for a variety of effects, including reverb and echo.
- Professional quality MIDI synthesizer with wavetable playback (4MB of real instruments audio). Up to 4MB of standard SMM-type memory can be added for sampling of new sounds.
- True 16-bit recording, using 64x oversampling and sigma-delta conversion technology.
- True 16-bit playback, with 64x oversampling and sigma-delta conversion utilizing 18-bit DACs, and an 8x interpolating filter.

WAVE 2.0

Professional Sound Editing for Windows 3.1 Compatible Sound Card

\$349⁰⁰

Wave is simply the best audio recording/editing/effects program available under Windows 3.1. With its logical layout, plethora of functions and wealth of effects, Wave will become an indispensable tool in your studio. Wave has the features (and interface) of a tape recorder. It supports stereo or mono recording/playback at 11,025, 22,05 or 44.1KHz sampling rates. Wave will work with any Windows 3.1 compatible audio board.

- Supports cut & paste editing (just like editing in a word processor) and has a full Undo function to eliminate fatal mistakes.
- Gain adjustment can be made to a whole file, or just the section you highlight.
- Wave can import and export a large variety of file formats, including SMP, SFI, WAV, 16-B and VOC. In addition, you can change the sample rate of previously stored files.
- EFX Clips function provides real professional effects like distortion, flange, digital delay, reverb, auto-stutter and others.
- A four band parametric equalizer function (WaveEQ) gives you the ability to touch up sections of your audio as well as the whole file. You can easily correct f-waves in the sound or go for the special effects.
- Speed control lets you adjust the playback rate of your recorded audio (up to 200% faster or 50% slower).
- You can mix up to three sound files into a new fourth one, with control of volume and starting time of each file.
- Glitches in the recorded sound can be repaired by simply drawing the correction on the waveform with your mouse.

\$99⁰⁰

QUAD STUDIO

Professional 4-Track Recording System

Quad Studio is the first real-time four track recorder for the PC. Now you can record two tracks directly to your hard drive (16ms or faster), then record two more tracks while playing back the first two. With its high performance and ease of use, Quad Studio is the perfect replacement for 4 channel mixer/cassette decks.

- Graphics interface emulates all common mixer/tape deck controls.
- Record, overdub, mix and bounce tracks in real time with no loss of quality.
- Previously recorded audio can be effects processed (using the optional Wave program) and then mixed, in real time, with new audio.
- Includes Turtle Beach's high-performance Tahiti board.
- Software is also separately available for Monterey cards.

\$399⁰⁰



BEHRINGER

MDX 1000 Autocom Automatic Compressor/Limiter



- Incorporates an interactive auto processor for intelligent program detection. With the auto processor, the attack and release times are derived automatically from the respective program material - preventing common adjustment errors.
- The auto processor also allows you to compress the signal flexibly and "musically" in dynamic range without any audible "pumping" "breathing" or other side effects.
- Provides both Attack and Release controls allowing for deliberate and variable sound processing.
- Switchable soft knee/hard knee characteristics. Soft knee is the basis of the "invisible" and "musical" compression of the industry. Hard knee is a prerequisite for creative and effective dynamic processing and for limiting signal peaks reliably and precisely.

MDX2000 Composer Interactive Dynamics Processor



- Powerful and versatile signal processing tool provides 4 most commonly dynamic control sections: fully automatic compressor, manually controlled compressor, expander and peak limiter.
- Innovative IKA (Interactive Knee Adaptation) circuit concludes the "musicality" of the "soft knee" function with the production of the "hard knee" characteristics. Provides subtle and "musical" compression of the sound allows creative dynamics processing.
- Auto processor provides fully automatic control of attack and release times. There is also manual control.
- Interactive Ratio Control (IRC) expander eliminates "clutter" on or around the threshold point.
- Interactive Gain Control (IGC) Peak Limiter combines a trigger and program limiter. This allows for "over" attack, distortion-free limitation of signal peaks.
- IGC is invaluable in live applications. Servobalanced inputs and outputs. Operating level switchable from -10dB to +4dB.

PEQ305 Studio Parametric The Musical Equalizer

- Five independent, switchable bands. The quality of each of the five frequency bands can be modified gradually from notch to broad-band characteristics. This offers more flexibility than any graphic equalizer can provide.
- Bands 1 and 5 are switchable between shelf and peak. This is extremely useful, since acoustic problems usually occur in the upper and lower frequencies.
- Utilizes the "Consistent Q" principle to eliminate interaction of the parametric frequency, bandwidth and amplitude. The same applies to interaction between the individual frequency bands.
- Parallel arrangement of the individual filters reduces phase shifting and associated delays to a minimum.
- Potentiometer response follows human hearing characteristics.
- Relay-controlled hard bypass with auto-bypass function during power failure.

DEQ8000 Ultra-Curve 31-Band Digital Graphics Equalizer/Analyzer

- The DEQ8000 is an innovative programmable graphic equalizer/spectrum analyzer built with digital technology. A two-channel unit, it features Burr-Brown 20-bit A/D and D/A converters for input and output. It achieves the dynamics and audio quality of analog equipment while avoiding the drawbacks of analog filters such as tolerances in components.
- Programmable two-channel equalizer with 31 graphic bands on digital basis.
- Filter settings are displayed either in the form of display slide controls or as a filter curve representing the actual frequency response and taking the influence of several adjacent filters into consideration.
- Shifting function makes the moving of groups of filters possible.
- Up to 3 additional notch filters can be used whose frequency and bandwidth is freely selectable.
- Search and Detour functions automatically detects resonant frequencies, thus acting as an automatic feedback suppressor.
- The integrated Real Time Analyzer features both peak and RMS weighting, a noise generator with a keystone output and a broad selection of auxiliary functions such as variable integration time, peak hold, etc.
- In Analyzer mode, a cursor is used to pull the amplitude of the single bands with an accuracy of .25dB.
- The signal source (measuring microphone or equalizer input) fed into the analyzer input is freely selectable.
- Various analyzer measurements can be saved and recalled for reference purposes.
- Auto EQ mode combines the analyzer with the equalizer section and thus allows for the automatic equalization of acoustic environments. Within 0.5 seconds, the Ultra Curve provides a linear frequency response based on the actual room acoustics.
- MIDI interface allows for selecting memory locations from an external MIDI controller. Remote control of all Ultra-Curve parameters can be realized via system exclusive information. Also, several units can be linked together via MIDI.

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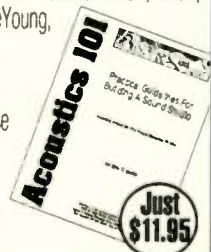
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1. Think Backwards--Plan Your Promotion First

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Be sure to also take advantage of the inexpensive promotion and distribution opportunities available on the World Wide Web. You can set up your own Web "homepage," or you may want to consider joining the Oasis-sponsored Musicians on the Internet program, which promotes your CD online & distributes it via the CDnow! superstore.

2. Work with a Qualified, Independent Graphic Artist

If you want your product to compete with the major labels, you have to look as good as they do. One-stop "chop-shop" duplicators who offer one-size-fits-all graphics aren't going to cut it.

This is your project: you need to sit down and work with your own graphic artist-- face-to-face. Resources for finding good graphic artists in your local area include local ad agencies, fellow musicians, or a free referral from the Oasis graphic artist database. (You can e-mail or call Oasis & we'll locate a good graphic artist for you in or near your hometown.)

3. Work with a Reputable Duplication Company

Oasis has several worthy competitors, but not all duplicators are reputable. Things to check:

- Financial stability of the company. (Caution: there has been a recent rash of duplicator bankruptcies. Make sure your duplicator won't collapse while it has your masters!)
- Is the price too LOW? If a deal seems too good to be true, it probably is.
- Consider the quality of the company's clientele--does it work with professionals--names you recognize? Ask for references.
- Consider how knowledgeable & helpful the company's staff is on the phone: do they know the music business? Are they interested in your project's potential?

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And check out "A Musician's Guide to CD Manufacturing," <http://www.escape.com/~rpisen/oasis.html> for a more thorough discussion of the topics we've touched on in this advertisement.

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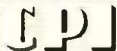
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continued from page 146

tioned can do this without a black box if you want them to. End of discussion.

The decision here is to decide whether or Knot (sorry, I couldn't help it) you want your CD to sound any good when the person who hears it on the radio buys it and tries to listen at home. In Nashville lately there has been a push to see who can limit their records the most and have them still remain intelligible. Some of these records are limited so much that the peak meters and the VU meters read exactly the same.

If you *must* have your record limited, use a digital-domain limiter, and you will be much better off if it is a multiband limiter like the one in the t.c. electronic M5000. Multiband limiters split the frequency spectrum into multiple sections. Each section is limited separately, so that a loud kick drum won't make the hi-hat level change. Bottom line is, be careful, you want people to buy your record and enjoy it at home also.

DEE PLORABLE

I went to get my album mastered and asked whether I should get a Sony

WE INTERRUPT THIS COLUMN...

Roger Nichols is back on the lecture circuit — at AudioTechniques in New York. Roger will moderate a four-hour long program on the Yamaha O2R on Wednesday, March 13 at the Sheraton New York Hotel. The program will cover 24-track digital recording, mixing, and audio-for-video production applications. Seating is limited, so call 212-585-5989 for reservations.

1630 or a premaster CD to send to the pressing plant and keep for future re-releases. The engineer told me that "1630's will be around forever, and only the place that cuts the CD-R can play it back." What the hell's the dang deal? —Dee Pressed

Dear Dee: I have had the same thing happen. They told me that CD-R will only play back on a special machine and you would be locked in to that facility. Without getting overly emotional about it, all I can say is *bull!* These guys are idiots, to put it mildly. The Sony 1630 is a 3/4-inch videotape format that *always* has dropouts.

Sony 1630 tapes from only a month ago will have dropout problems. Every time you play a 1630 tape it will have more errors than it did the time before. Sony discontinued 1630 production over a year ago. The 1630 format will not support 20-bit and 24-bit formats. No more 1630's are being produced, and Sony is trying to set the PCM-9000 as the

mastering standard. It is a fact that CD-R discs will play back on any CD player — the one in your car, your Walkman, the one in your living room, the one at the CD plant, and the one at any other mastering facility. A CD-R will not have any more errors after 1000 plays than it did after the first play. CD-R discs typically have a much lower error rate than commercially released CDs.

I think that the mastering facility is afraid that you may be going somewhere else to get your work done, and they have to protect their clientele by producing fabrications rather than high-quality results.

ENUFF

So, ahh that about does it for this round. If you have any pressing audio or marital questions you would like answered, e-mail me at rnichols@digital-atomics.com and check out the Web Site with all of my EQ columns at <http://www.digital-atomics.com>. **EQ**

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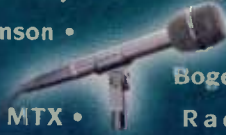


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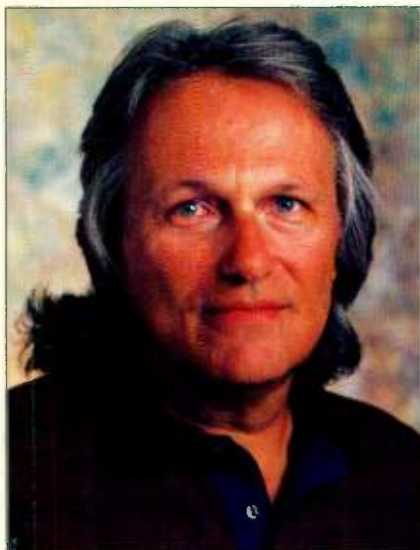


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What's The Dang Deal?



Answers to some of
the questions that are
lobbed at me

BY ROGER NICHOLS

Some questions from readers have been piling up for a long time now. E-mail, snail-mail, female... questions from all corners of the universe. The questions this month center around CD mastering. I will attempt to straighten out a few things right here, right now.

ONCE SHY

I have been sending my final masters to one particular mastering facility because they say that they are the only place in the world that can make my 16-bit mixes into HDCD [High Definition Compatible Digital, the digital audio encoding-decoding process

developed by Pacific Microsonics, Berkeley, CA.] What the hell's the dang deal. —Twice Bit.

Dear Twice: There are a couple of issues here. One is the fact that you cannot add more bits to improve your record by playing back your 16-bit master and recording it into a 20-bit machine. It is like transferring a VHS video tape to Digital Betacam. VHS tape only has 240 lines of resolution and the picture won't improve by copying it to a higher-resolution medium. At this time, the HDCD encoder only allows analog in. This means that you have to send your 16-bit signal out through a D/A converter, which can slightly change the sound you thought you had, and then back into the HDCD encoder through its A/D converters. You have not gained anything. In fact, you have actually lowered the signal-to-noise ratio by about 1.2 dB and added to the high-frequency grudge that is usually associated with digital audio.

I have mentioned encoding in this answer because the HDCD process is indeed an encode/decode process. This means that if your material was 20-bit and run through the HDCD encoder, you could only get the 20-bit information back if you own an HDCD decoder or a CD player with an HDCD decoder built in. Without the decoder, you get less than 16 bits of audio out of the CD, and because of the extra conversions during mastering, it won't sound as good as your original 16-bit master.

If you wish to have your CD released in HDCD format, you should mix directly to the HDCD encoder, and then make sure the mixes are good enough that you don't have to do anything in mastering, because any further processing will destroy the encoded signal and you will be worse off than if you just mixed to 16-bit as usual.

One last comment on this subject: HDCD only stores 16 bits on a CD, because the CD format can only store 16-bit audio. Next year, when the audio version of DVD is released, you will be able to store 20-bit audio without encoding and decoding. Your best bet to get ready for 20-bit is to mix 20-bit onto a Sony PCM-9000, the new Studer Optical Disc Recorder, or directly into SADiE or Sonic Solutions. After mastering, tell the mastering

facility that you want a 20-bit EQ copy of the final product. When the high-resolution CDs are ready, you'll have a catalog of 20-bit projects ready to go without remastering.

IN DEEP

I work for a company that invests in startup companies. We are currently considering investing \$8 million in a company which says that it has a black box that can be inserted into the digital audio chain and makes digital audio sound "warmer." What the hell's the dang deal? —Deep Pockets

Dear Deep: First of all, let me say that I really loved your movie with Nick Nolte and Jacqueline Bisset. Second of all, I will build you the same box for \$7 million. These guys are really pulling your chain. I hear stories like this all of the time. "You should only work here because we have a special box that will make any kid that listens to this CD want to do his homework." Gadgets like this are not going to make your mixes sound better. You can make digital audio sound as warm as you want. If you take your final mixes to Doug Sax or Bob Ludwig or Bernie Grundman or Scott Hull or Greg Calbi, they can warm up your mixes because they know what they are doing and can tell by "listening" whether a mix sounds good or not. Guys like these don't need — and probably wouldn't use — a magical box like this. Now, if there was a box that made your record a guaranteed hit by running your mixes through it, that's another story.

KNOT FOR NOTHING

When I listen to my mixes at home they sound great, but when I hear them on the radio, they don't sound quite as loud as the records around it. What the hell's the dang deal? —Knot Loudenuff

Dear Knot: Here is another one of those "black box" deals. One mastering room I heard about has all of the record companies banging down its door because it reportedly has a box that will make mixes louder on the radio. This is simply done with EQ and compression. If your midrange is brighter and you used more compression, then your record will sound louder. The mastering guys I men-

continued on page 144

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