

REVIEWS • TUBE TECH EQ • SAW SOFTWARE • AB INTERNATIONAL AMP  
THE ULTIMATE SAMPLING CD ROUNDUP

THE PROJECT  
RECORDING  
& SOUND  
MAGAZINE

OCTOBER 1994

# MIDI MEETS THE PROJECT RECORDING STUDIO



09 > **\$3.95**

Can. \$4.95  
U.K. £2.60

OCTOBER 1994  
Display Until  
11/1/94

*The ultimate MIDI-head: Craig Anderton*

World Radio History



# A SOUND MODULE SHOULD DO ONE THING: SOUND GREAT

When we designed the new S4™ 64 Voice Sound Module, we realized that when you put aside all the bells and whistles, only one feature makes the difference between a decent sound module and a great one. It's the sound.

Great sound starts with a superior synthesis engine. The S4's sound engine was created by the design team that was responsible for some of the greatest and most popular synths in keyboard history. It's one of the most powerful synthesis engines ever offered at any price.

Then, we made a list (and checked it twice) of the best sound programmers in the industry. Alesis formed its own top-notch sound development team specifically for the S4. We also got help from InVision, an incredibly innovative group of sonic designers, to fine-tune the S4's patches. InVision has provided more world-class, usable sounds to the keyboard industry than any other independent developer.

The result? The S4 provides 256 brilliant programs out of the box. Programs you'll really use. In fact, you'll find that every sound on the S4 was carefully designed to be inherently musical and expressive. You'll also get 200 multitimbral mixes that will make the multitimbral stuff on your old synth sound like...well, sound old. Plus, the S4's 64-voice polyphony will let you sequence those programs and mixes and avoid the hassles of voice robbing more than ever before. On

each of the 64 voices, the S4 provides three LFOs, three envelope generators, a tracking generator, and many more tools to personalize your patches. Also, the onboard Alesis effects give you the opportunity to create a CD-quality mix from a single rack-space unit. All in all, you can't find more useful, hard-working sounds.

Now let's put the bells and whistles back. The S4 gives you a massive 16 megabytes of onboard sample ROM, which expands to 24 meg via the PCMCIA RAM/ROM card slot on the front panel. This card slot also provides access to a great selection of pianos, ethnic instruments, and other sound banks that our in-house team and 3rd party developers continue to create. Also, with its virtually unlimited modulation routing matrix, the S4's sonic versatility both in studio and live performance is nothing short of incredible. By providing the power to route almost any controller to any target parameter, the S4 puts all the options in your hands.

The S4 also offers the ADAT® MultiChannel Optical Digital Interface™, so you don't have to leave the digital realm when recording direct-to-ADAT. As you can see, the S4 provides a lot more than one thing. But you can't see the one thing that the S4 does the best: the sound. Alesis is committed to the keyboard industry, and nothing reflects that commitment more powerfully than the sound of the S4. Listen carefully to the S4 at an Authorized Alesis Dealer today.



# S4™

**QUADRASYNTH 64 VOICE SOUND MODULE**

S4 and ADAT MultiChannel Optical Digital Interface are trademarks of Alesis Corporation.  
® Alesis and ADAT are registered trademarks of Alesis Corporation. All other trademarks are the property of their respective holders.

**Alesis Corporation** Phone: 1-800-5-ALESIS (In North America Only) / E-mail: ALESCORP@Alesis1.usa.com  
3630 Holdrege Avenue Los Angeles CA 90016



**CIRCLE 04 ON FREE INFO CARD**



[ 1954 ]



[ 1955 ]



[ 1956 ]



[ 1957 ]



[ 1958 ]



[ 1959 ]



[ 1960 ]



[ 1961 ]



[ 1962 ]



[ 1963 ]

We'd like to thank all the various C12 impersonators over the ensuing years

for painstakingly trying to capture the original C12 sound and, instead, helping to make the originals



worth up to \$7000. We'll take it from here. [ 1994 ] It's Back.

AKG stopped making the legendary C12 in 1963. Since then, people have spent decades and small fortunes trying to recreate its remarkably pure sound. Now after thirty years we've decided to bring back the original. So you can get a real C12 at a more realistic price. And all those impersonators can get a life.



**H** A Harman International Company

AKG Acoustics, 8500 Balboa Blvd., Northridge, CA 91329 USA Phone 1-818-893-8411 Fax 1-818-909-9748 Flash Fax 1-818-909-6576 ID#946



# EQ



PROJECT RECORDING  
& SOUND TECHNIQUES  
VOLUME 5, ISSUE 9  
OCTOBER 1994



## FEATURES

### MIDI & THE PROJECT STUDIO

This section offers the latest updates on MIDI for recording musicians. Here's what you'll find:

#### MIDI TIMELINE & OVERVIEW *By Craig Anderton*.....50

A look at how far MIDI (and the rest of us) have come since its introduction in 1981. Plus, the low-down on all this special section has in store for you and the breaking of the "slow MIDI" myth.

#### ALL THE RIGHT MOVES *By Steve La Cerra*.....54

There was a time when only the big commercial studios had console automation, but thanks to MIDI, even the overworked project studio owner can take advantage of this essential tool.

#### MIDI ET MACHINA *By Paul D. Lehrman and Tim Tully*.....59

MIDI Machine Control brings a whole new level of automation into the project studio.

#### THE ART OF TOTAL CONTROL, PART 1 *By Craig Anderton* .....64

MIDI was once thought of as a tool for keyboardists, but wait 'till you see what the world of MIDI signal processors can do for you.

#### MAKE WAY FOR SMDI *By David Miles Huber*.....70

Tired of being stalled by SCSI? SMDI, a perfect companion to MIDI, gives you the speed you've been longing for.

#### MAKING MIDI CABLES *By Craig Anderton* .....76

Save money and get some tailor-made MIDI cables you can trust by doing it yourself.

#### MIDI BUYER'S GUIDE.....80

A listing of some of the hot MIDI products that are sure to make project studio life even better.

## EQ LIVE

#### BRUCE JACKSON: THEY CALL HIM BRUCE *By Steve La Cerra* .....85

#### HE AIN'T HEAVY, HE'S MY RECONER *By Steve La Cerra* .....90

#### NEW GEAR FOR YOUR NEXT GIG .....96

#### ROAD TEST: AB INTERNATIONAL MODEL 9620 POWER AMPLIFIER *By Wade McGregor*.....98

## TECHNIQUES / WORKSHOPS

#### SAMPLING CD OVERVIEW & REVIEWS *By Craig Anderton & Tona Ohama*.....36

## COLUMNS / DEPARTMENTS

#### MI INSIDER: POINT/COUNTERPOINT: IBM VS. APPLE *By Craig Anderton* .....24

#### FAST FORWARD: THE BIG SQUEEZE, PT. 1 *By Martin Polon*.....124

#### MULTIMEDIA: SMART AND NO LONGER DUMB *By Murray Allen* .....126

#### ACROSS THE BOARD: GEAR SLUT TO THE MAX *By Roger Nichols*.....130

#### LETTERS TO EQ .....6

#### EQ&A .....8

#### PRODUCT VIEWS: AES PREVIEW .....16

#### STUDIOWARE PRODUCTS .....22

#### ROOM WITH A VU: DANIEL REY .....26

#### ROOM WITH A VU: JOE MARDIN .....28

#### MICRO-PHILE: MICROTECH GEFELL UM 92 S .....30

#### IN REVIEW: TUBE TECH LCA2B .....104

#### IN REVIEW: INNOVATIVE QUALITY SOFTWARE SAW...104

#### AD INDEX .....99

EQ (ISSN 1050-7868) is published ten times each year by P.S.N. Publications, 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.

Cover photo by Ed Aiona. Photo manipulation by Abdullah Oblongata.



# IMPROVE YOUR SONIC LANDSCAPE

*for about the price of  
a weed wacker.*

Sure, you can pay big bucks to get professional sounding tracks at a swanky, expensive studio. Or you can just stay home and add the dbx 266 compressor/ limiter /gate to your set-up. Not only do you get classic dbx compression but you also get AutoDynamic™ Attack and Release controls that allow you to produce voicing that extends from slow leveling to aggressive peak limiting. And with the expander/gate, you can tighten flabby drums, change the characteristics of an instrument, even cut out unwanted noise faster than a weed wacker. So for around 300 bucks, you can improve your sonic landscape to create tracks so clean, so polished, so downtown, that no one will believe you did the work in a garage.

**dbx**

**266 COMPRESSOR/GATE**



**H** A Harman International Company © 1994 dbx Professional Products, 8760 South Sandy Parkway, Sandy UT 84107  
Phone 801-588-7660 FAX 801-588-7662 International FAX 603-672-4246

**CIRCLE 25 ON FREE INFO CARD**

World Radio History



A PSN Publication  
Vol. 5, No. 9  
October 1994

# PAUL G. GALLO

Publisher/Editorial Director

# KATHLEEN MACKAY

Associate Publisher

# HECTOR LA TORRE

Executive Director

# MARTIN PORTER

Executive Editor

# ANTHONY SAVONA

Managing Editor

# CRAIG ANDERTON

Technology Editor

# DAVID JACOBS, STEVE LA CERRA

Senior Editors

# DENISE MCMUNN

Associate Editor

# MELISSA HUNTER

Assistant Editor

DAVID MILES HUBER, EDDIE CILETTI,  
DAVID FRANGIONI, BOB LUDWIG,  
WADE MCGREGOR, ROGER NICHOLS,  
MARTIN POLON, J.D. SHARP

Contributing Editors

# MP&A EDITORIAL

Editorial/Design Consultants

# MATT CHARLES

Sales Manager

DANIEL A. HERNANDEZ, ANDREA BERRIE,  
CHRISTINE CALI (Classifieds)

Advertising Sales

# RIVA DANZIG

Creative Director

# MARK ALHADEFF

Art Director

# SUSAN FALCO

Assistant Art Director

# FRED VEGA

Production Manager

# Editorial Offices

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

# Administrative/Sales Offices

2 Park Avenue, Suite 1820  
New York, NY 10015  
Tel: (212) 213-3444, Fax: (212) 213-3484



EQ (ISSN 1050-7868) is published monthly except for July and November by P.S.N. Publications, 2 Park Avenue, Suite 1820, New York, NY 10015. 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 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 and product names are manufacturers' registered trademarks. Printed in the U.S.A.

## LETTERS TO EQ

### BOOK 'EM

After reading Steve Schwartz's "Buy the Book" in the August issue and Alan Kefauver's comments in September, it's time for me to chime in.

I am the sole author of *The Recording Studio Handbook*, now out of print. Some years ago, Professor Roy Pritts asked me about a new book, *The New Recording Studio Handbook*. He saw my name on its cover as lead author, and for some reason assumed I would know something about it. At the time I didn't, nor do I recall the details of our chat. In retrospect, I hope I didn't say it was pirated, but perhaps I did. Since the title is so close to that of the book I did write, it would be just the sort of thing one might expect in a pirated edition. However, I subsequently found and purchased a copy of the book in a local bookstore. Its cover and spine list it as "by John M. Woram and Alan P. Kefauver," which would certainly account for Prof. Pritts's assumption.

I noted in the book's preface that Alan Kefauver (whom I have never met) was "very surprised when [he] was asked to do the revision." I had a similar feeling, being very surprised that he accepted. No doubt he had his reasons, as did I for turning down the same task. Mine were that I had recently taken legal action against the publisher, who had not paid royalties owed me totalling in excess of \$20,000. Thanks to the New York State Supreme Court judgment in my favor, I was able to recover the money owed me, but not my confidence in doing another work for the same publisher.

In case Prof. Pritts still thinks *The New Recording Studio Handbook* is a pirated edition, I take this opportunity to assure him and all *EQ* readers that — to the best of my knowledge — it is not. But I would also like you all to know that I had nothing whatsoever to do with its production. This is not a criticism of content; it's just that I prefer to be judged by what I do write, rather than for what now appears under my name. It is reasonable for any literate person to assume that the person listed as a book's primary author is the book's primary author. That's usually the way these things are done. But not in this case, which I suppose has more to do with ethics than with the law.

To close on a cheery note, I see that several schools still use, and presumably buy, *The New Recording Studio Handbook*. I guess that means it's

still in print. Perhaps I'll see some royalties on it one of these days. The last time that happened was in 1991.

John M. Woram  
Rockville Centre, NY

### MIXED SIGNALS

Chris Foreman's article, "Do (or Don't) Process," in the August issue contains much useful information. It also makes some misleading statements, including this one: "Without its processor, a processed loudspeaker system won't work as intended...." It is possible (though not easy) to design an internal passive crossover that provides all the functions of an external active processor. For instance, a switch on the input panel of EAW's SM Series stage monitors selects biamp (using our MX200i closely coupled electronic processor) or full-range passive mode (using no processor at all). You give up a little bit of output in passive mode, but frequency response, power handling, and other significant parameters are identical.

Chris also states: "Today's processed loudspeakers are generally packaged systems (woofer and tweeter in one box)." Choosing a processed system does not restrict you to a two-way box; many manufacturers offer three-way or four-way processed systems. Some of EAW's larger processed systems are four-way designs that use not one, not two, but three boxes: a mid/high system, a low-frequency system, and a subwoofer system. One processor controls them all.

I hope that *EQ* readers heed the article's warning about the diagram on page 74 (fig. 2 of the article). The diagram's placement of the limiter before the crossover in the signal path is especially misleading — to my knowledge, no ded-

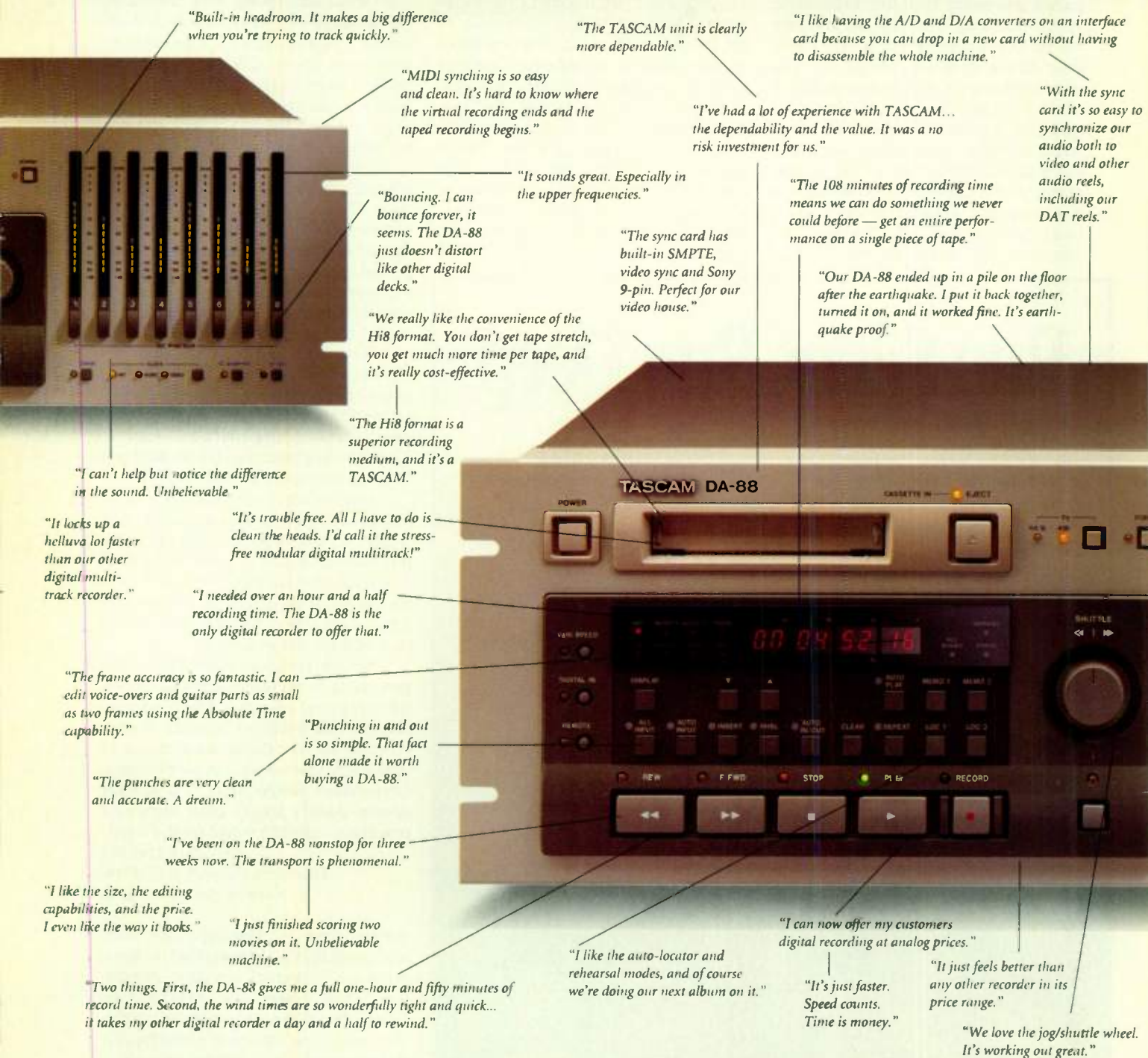
### CORRECTION

In the last column of the Alesis QuadaSynth review that appeared in the September issue, a sentence was incomplete. It should have read:

*In any event, the bottom line is that the Huge wheel really has to stay "Hugely" at maximum all the time or those bits will start dropping away and the dynamic range will actually decrease — as opposed to the QuadraSynth's simply putting out less volume.*



# What do you like best about your DA-88?



"Built-in headroom. It makes a big difference when you're trying to track quickly."

"The TASCAM unit is clearly more dependable."

"I like having the A/D and D/A converters on an interface card because you can drop in a new card without having to disassemble the whole machine."

"MIDI syncing is so easy and clean. It's hard to know where the virtual recording ends and the taped recording begins."

"I've had a lot of experience with TASCAM... the dependability and the value. It was a no risk investment for us."

"With the sync card it's so easy to synchronize our audio both to video and other audio reels, including our DAT reels."

"Bouncing. I can bounce forever, it seems. The DA-88 just doesn't distort like other digital decks."

"It sounds great. Especially in the upper frequencies."

"The sync card has built-in SMPTE, video sync and Sony 9-pin. Perfect for our video house."

"The 108 minutes of recording time means we can do something we never could before — get an entire performance on a single piece of tape."

"Our DA-88 ended up in a pile on the floor after the earthquake. I put it back together, turned it on, and it worked fine. It's earthquake proof."

"We really like the convenience of the Hi8 format. You don't get tape stretch, you get much more time per tape, and it's really cost-effective."

"The Hi8 format is a superior recording medium, and it's a TASCAM."

"I can't help but notice the difference in the sound. Unbelievable."

"It locks up a helluva lot faster than our other digital multitrack recorder."

"It's trouble free. All I have to do is clean the heads. I'd call it the stress-free modular digital multitrack!"

"I needed over an hour and a half recording time. The DA-88 is the only digital recorder to offer that."

"The frame accuracy is so fantastic. I can edit voice-overs and guitar parts as small as two frames using the Absolute Time capability."

"Punching in and out is so simple. That fact alone made it worth buying a DA-88."

"The punches are very clean and accurate. A dream."

"I've been on the DA-88 nonstop for three weeks now. The transport is phenomenal."

"I like the size, the editing capabilities, and the price. I even like the way it looks."

"I just finished scoring two movies on it. Unbelievable machine."

"Two things. First, the DA-88 gives me a full one-hour and fifty minutes of record time. Second, the wind times are so wonderfully tight and quick... it takes my other digital recorder a day and a half to rewind."

"I like the auto-locator and rehearsal modes, and of course we're doing our next album on it."

"I can now offer my customers digital recording at analog prices."

"It's just faster. Speed counts. Time is money."

"It just feels better than any other recorder in its price range."

"We love the jog/shuttle wheel. It's working out great."

## No wonder the DA-88 is the preferred digital multitrack.

It features the latest generation in digital multitrack recording technology. According to users, it's the best sounding, best built, most functional and affordable digital multitrack on the market.

You're going to love the DA-88. Get to your dealer now and see why!

"It's the name. They make the best recording equipment, period."

### TASCAM®

Take advantage of our experience.

CIRCLE 72 ON FREE INFO CARD

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

World Radio History

"I wanted the serious machine for music production. That's TASCAM."

"I can lock it to video and my analog machines with no hassle. Life is so easy now that I have my DA-88."

"I'm focused on the TASCAM. It will become the standard. And I don't want to be left out."



icated processor includes broadband system limiting. Instead, limiters are placed after the crossover to operate on each frequency band individually. The text reinforces these misconceptions when it states, "Because the processor probably includes functions like electronic crossover, equalization, and limiting, it may be appropriate to add the cost of similar external devices to the cost of a nonprocessed speaker system when making comparisons." For the electronic crossover, yes. For the rest, no.

Whatever you do, don't sell those general-purpose signal processors to get the down payment on a processed speaker system. A dedicated speaker system processor optimizes the performance of a particular set of drivers in a specific enclosure. Separate EQs, limiters, and delays give the system operator the control required to deal with the quirks of a particular listening environment. Both types of devices are necessary for a successful installation or gig.

"Small size, along with the trapezoidal shape of most processed loudspeaker systems, makes it impossible to array them neatly with good acoustical results." Small trapezoidal enclosures are readily available in both processed and unprocessed varieties. Neither small size nor slanted sides (nor speaker processing as it generally exists today) have any significant effect on acoustical results in an array. The most important factor in array performance is consistent dispersion over the widest possible operating band. Walk the room in front of any cluster of small two-way trapezoidal systems, and you will hear the lobbing and comb-filtering that result from inconsistent dispersion.

"Most processors are digital..." Most processors today are analog. Two years from now, that may well change, as new technology and more intelligent design approaches expand dynamic range and reduce throughput delay to negligible levels.

Large central clusters used to be designed using separate horns and woofers. Today's leading designers are building three-way systems, often with one enclosure covering the main portion of the audio spectrum. These systems often use integrated processors to maximize performance.

At EAW, we use integrated electronic processing to achieve maximum output, smooth power response, low distortion, and other desirable performance characteristics. But electronics are a means to optimize performance, not to overcome fundamental design flaws. If a speaker system doesn't sound good without a processor, it doesn't sound good. Period.

*Christian Doering  
Director of Communications  
Eastern Acoustic Works*

*[Editor's Note: Mr. Doering's letter sheds additional light on how difficult it often is to discuss important, evolving technologies in generic terms. The objective of the "Do (or Don't) Process" article was to further involve our readers in recent speaker developments that could be valuable to their creative businesses. The article's diagrams and language were meant to be generic and nonproduct specific, and in no way meant to be misleading or cast aspersions on any company's designs. EQ hopes that readers will use the article as a starting point to learning more about processed systems and then be motivated to contact manufacturers regarding individual technologies. —H.G.L.]*

## Run Silent, Run Deep

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

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



Ashly Audio Inc., 100 Fernwood Avenue Rochester, NY 14621 • Toll Free: 800-828-6308 • 716-644-5191 • FAX: 716-266-4589  
In Canada: Gervaudio Dist Inc., 2 Thorncliffe Park Dr., Unit 22, Toronto, Ontario M4H 5H2 • 416-696-2779 • FAX: 416-467-5819

CIRCLE 68 ON FREE INFO CARD

World Radio History



# WE TOOK EVERYTHING WE KNOW ABOUT MIXING

You know Yamaha makes some of the best live sound reinforcement consoles. Not to mention some of the best digital mixers.

And our expertise in signal processing is second to none.

That's why we strongly suggest you take a good hard look at the latest member of the family — the exceptional ProMix 01™.

Everything we know has gone into this mixer. Beneath its compact, rugged exterior lies the most irresistible combination of digital technology ever assembled.

For the cost of a low-priced analog mixer, you can now get a digital one that has instant recall of all console settings.

ProMix 01 also has motorized faders and is capable of dynamic automation.

That way, entire mixes can be recorded and played back with any outboard MIDI sequencer. Saving creative energy. Not to mention a lot of time.

As if that wasn't enough, ProMix also has two internal digital effect processors. Three assignable stereo compressors. Superb three-band parametric EQ on each channel.

Even an EQ Library where you can store all your favorite settings.

And when it comes to complex mixes, fader grouping lets you control multiple channel levels from a single fader. There also happens to be a stereo "pair" function that allows changes in the left channel (such as EQ and gain) to be automatically mirrored in the right channel.

Sound pretty good?

Actually it sounds pretty great. ProMix 01 boasts more than 100dB of dynamic range. All made possible by the latest 20-bit AD/DA converters. Which virtually eliminate all noise, distortion and crosstalk.

The system also features digital output for flawless audio transfers to R-DAT and other digital mediums.

And has a large backlit LCD screen to help you see all your mix parameters at a glance.

As you can see, ProMix 01 has plenty of things going for it. With its memory, automation capabilities and onboard digital effects, it completely justifies spending \$20,000.

Of course, that price would buy you 10 of them. For a demonstration of the remarkable ProMix 01, check your nearest Yamaha dealer.

For more information, call  
1-800-937-7171, Ext. 370.



## AND CONDENSED IT.

**YAMAHA**  
Programmable Mixing





## THE LIVE CONNECTION

**Q** What main factors should I keep in mind when trying to properly match the power-handling requirements of sound-reinforcement speakers with amplifiers?

Salvatore Palumbo  
La Jolla, CA

**A** Professional loudspeaker systems are designed around two types of transducers (devices that turn electrical power into acoustical power): the cone and the compression driver. Both are basically electromagnetic motors and share two main failure modes: overexcursion and overheating. Overexcursion is caused when the power amplifier delivers too high a voltage to the speaker terminals, as it might when reproducing a snare crack. Excess voltage moves the cone or the compression driver diaphragm too far. This can cause mechanical damage to a cone, surround, or spider, or it can drive the voice coil out of the magnet's gap. A compression driver diaphragm can contact the phase plug and shatter. Overheating occurs when the amp delivers too much current, as could happen in reproducing a dance/trance bass line — the voice coil melts and ceases functioning.

Along with voltage and current, time is the other critical factor that affects power handling. The time interval in voltage/excursion testing is short, but finite — a cone or diaphragm has mechanical inertia, so it takes time to start moving. If the impulse is short enough, you can apply almost any voltage to the speaker terminals without damaging the transducers. In an effort to provide impressive specs, some manufacturers have become very creative in designing ultrashort impulse tests. The AES has set standards for the duration of the voltage impulse, thereby allowing buyers to compare apples with apples.

In thermal testing, we are looking at much longer time intervals. At EAW, we specify a 100-hour sine wave test as

well as AES-standard power handling. The 100-hour sine wave test shows the long term effects of high-current operation on voice coil temperature. Over still longer periods of several years, material fatigue will reduce any transducer's ability to withstand high-voltage transients and high-current operation.

We normally recommend that EAW loudspeaker systems be powered with an amp capable of delivering the system's AES power rating. That should give you enough headroom to avoid clipping the amplifier (which can cause thermal failure of the compression driver because it vastly increases the average high-frequency energy) without driving the cones and diaphragms past their excursion limits.

Andrew Rutkin  
Applications Engineer  
Eastern Acoustic Works

## MIC TRICK

**Q** I really liked the Steve Albini article on miking guitars (August 1994) but I'm specifically looking for ways to mic a midsize amp with an open back cabinet — the sound always seems thin.

Jennifer Soules  
Memphis, TN

**A** If you use a single mic pointed at the front of the amp, the sound seems thin because the out-of-phase wave coming from the back of the amp cancels the front wave somewhat, particularly at lower frequencies (where the wavelength is long). You can actually use this to advantage, though: Bob Reardon (of Lexicon) suggests using two mics, with the main one pointed at the front of the cabinet and another one pointed at the rear. Adjust distance from the amp to suit, but typically they'd be a foot or two away.

Now flip the phase on the mic pointing at the amp's rear. Set the main mic to the desired level, then slowly add in some of the phase-flipped signal. At some point, the amp sound will get a real "kick" where the waveforms add. Try this; it's a very clever trick that really works.

Craig Anderton  
Technology Editor

## HEAD CASE

**Q** In working with video decks, I've found a phenomenon where it takes about 20 hours of wear, after replacing video heads, to contour the new heads to the tape path, after which noise and dropout readings improve. Is this also the case with DAT machines and other audio rotary head systems?

Christopher T. Williams  
Columbus, OH

**A** It is normal for video machines with new replacement heads to require time before they settle in. This is due to the tape-to-head contact not being optimized until the head face has contoured slightly. My experience with R-DAT machines has shown that a new drum will produce very low error rates from the day it is installed. [EQ invites other manufacturers of machines utilizing audio rotary head technology to contribute their findings on this subject. —H.G.L.]

Tom DeFiglio  
Senior Digital Product Specialist  
Otari Corp.

## CALLED ON INTERFERENCE

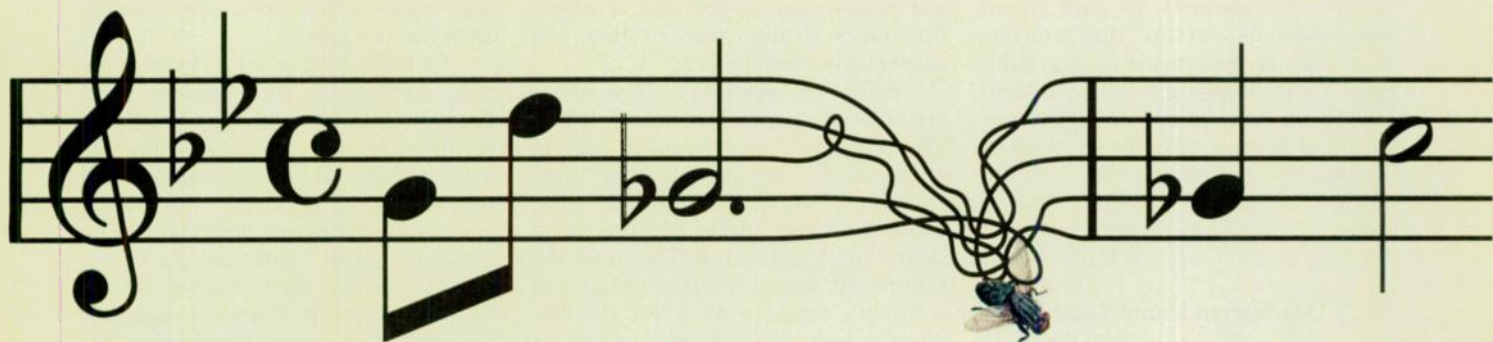
**Q** My studio's closed-circuit TV monitor is interfering — in the form of a 13k to 14k tone — with my mixer and compressors. How can I stop this without relocating the monitor?

Dale Drumheller  
Morrisville, Pa

**A** Actually, a standard television monitor uses 15.7 kHz and 60 Hz as the horizontal (H) and vertical (V) scanning frequencies, respectively. The range of human hearing is between 20 Hz and 20 kHz, although the upper limit is typically less (between 16 kHz and 18 kHz). Many people can hear the horizontal scan frequency radiated by video monitors. (Low-resolution computer monitors use similar scan rates, but high-resolution monitors push the "H" rate past the range of human hearing.)

In order to move the electron beam from left to right and top to bottom, power amplifiers "pump up" the signals to drive the monitor's H/V deflection coils. The coils, which require about 15 watts each, can radi-





## If it's in the room, it's on the tape.

3M™ 966 and 3M 996 Audio Mastering Tapes are so accurate they capture every nuance in the studio—from the emotion in a blues note, down to the fly on the wall. 3M 966 tape lifts technological barriers by allowing you to record more signal with less print, so you get less print-through without higher noise. It's all you need to record every note, every beat, and every whisper

in the music with crystal clarity. But if you do want more, there's 3M 996 tape. The industry standard in high-output audio mastering tapes. So for true sound reproduction, demand 3M 966 and 3M 996 tapes. And as a precaution, you might want to invest in a little bug spray. For more information, call 1-800-752-0732.



**3M**

*Reliability*

ate video information into nearby audio cables or electronics.

The best way to determine if the problem is proximity related is to physically move the monitor. If the interference is reduced, relocate the monitor (the easiest solution), redress the wiring, or move the gear, in that order.

If your monitor is part of an audio-for-video setup, the interference may be the result of a ground loop. Try unplugging video, sync, and SMPTE cables to determine if there is a ground loop. If possible, plug all of the gear into the same power outlet to minimize power-related ground loops.

Eddie Ciletti  
President

Manhattan Sound Technicians  
New York City

## MAN OF A 1000 FX

**Q** I'm a guitar player who's just getting into multieffects, but there

are so many to choose from. Which, in your opinion, is the best multieffects for me to buy?

Darryl Clayton  
Detroit, Michigan

**A** The secret to choosing the right multieffects is to define your needs as specifically as possible. It's like buying a car: do you want a vehicle that takes corners fast, or that can carry all your band's gear?

Here's an example of how needs dictate a particular processor: When playing guitar, I don't want to depend on a particular amp to get "my" sound. So I use lots of signal processing before the guitar hits the amp input, and a clean amp. This gives the same basic sound whether I plug into a mixing console or a PA system. What I require in a multieffects is great distortion and equalization, because that's what helps simulate the sound of various amps. However, a guitarist who relies on a particular amp's distortion characteristics

would generally prefer a signal processor that delivers superb clean effects such as chorus, delay, and reverb.

After defining your needs, hit the music stores. Remember that different stores specialize in different lines, so Store A might push one brand and Store B another. Don't be swayed by sales talk; let your ears and requirements be the judge.

Go through the factory presets for each multieffects that interests you. These presets try to give a wide range of effects to show the unit's capabilities, so if few of the programs excite you, move on (although the device may simply have been programmed by someone with different musical tastes). Narrow your search to the units whose basic sound pleases you the most, then peruse the details. You may never find the perfect multieffects, but you can find one that's right for you.

Craig Anderton  
Technology Editor

**TUBE TECHNOLOGY**

**Come See Us at AES Booth #1922**

**TL Audio In-Line 8 Bus Tube Mixer**  
\$4,495  
4 band tube equalization, balanced inputs, tube mix amp, balanced outputs. Modular expandable in 8 channel sections to 56 inputs. (Module left)

**TL Audio Tube EQ**  
\$1,395  
9 channels x 4 band tube EQ, balanced mic & line inputs, +48V phantom power, front panel AUX input, bypass switch.

**TL Audio In-Line 8 Bus Tube Mixer**  
\$1,595  
4 band tube equalization, balanced inputs, tube mix amp, balanced outputs. Modular expandable in 8 channel sections to 56 inputs. (Module left)

**TL Audio Tube Compressor**  
Pre-amp tube compressor, balanced mic & line inputs, +48V phantom power, 12 AUX inputs, variable 'soft limit' compression.

**TL Audio Classic Console: IC, Transistor or Tube modules**  
The NEW Modular expandable in-line IC, re-amp, transistor audio console. All three technologies can be mixed within the console. Custom film version made to order. (Product not shown)

Distributed by:  
**SASCOM**  
MANHATTAN GROUP  
Call or Fax for more info:  
Tel: 905 420-3946  
Fax: 905 420-0718

Worldwide Distribution: Tony Larking Professional Sales Ltd.  
Letchworth, SG6 1UJ (UK). Tel: +44 (0)462 480009 Fax: +44 (0)462 480035



## The VMP™ 2 Two Channel Vacuum Tube Preamp

# The Sole Requirement

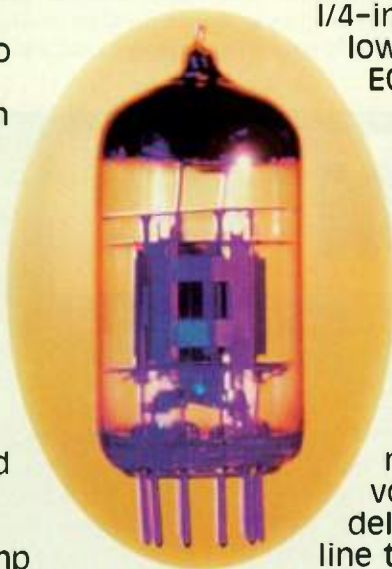
Digital technology has come a long way. The clean, crisp sound survives from creation to studio reproduction without degradation or signal loss. But in the golden analog days, some of the signal changes picked up through the signal flow actually enhanced the sound, especially on vocals. A sort of warm, fuzzy presence with soul.

Not to worry. . .by request from studio technicians, Peavey Electronics has developed the VMP™ 2 to add that vintage analog sound. The VMP 2 is dual-channel 12AX7 vacuum-tube microphone preamp with a unique input-transform design and exceptional frequency response. The front panel features a -20 dB input pad,

switchable +48 volt phantom power, a 1/4-inch high-Z line input, high and low shelving-type EQ, and an EQ-bypass switch.

The output stage of the VMP 2 is all-tube, as well, and employs a power-amp design to create the +19 dBm output capability which is available on either a fully transformer-balanced XLR connector or a 1/4-inch phone jack. And a custom-designed power supply consisting of a special low-hum field power transformer with magnetic shielding and high-voltage regulator circuitry delivers the juice without power-line transients and voltage variations.

**The VMP 2... puts the soul in the signal flow.**



# PEAVEY®

AUDIO MEDIA RESEARCH™

711 A Street, Meridian, MS 39301 / Telephone: (601)483-5365 / Fax: 486-1278

CIRCLE 51 ON FREE INFO CARD

World Radio History



## DECIBELS DEFINED

**Q** I just don't get what decibels are all about. Can you give me a 25-words-or-less definition?

Jimmy "Jimbo" Madison  
Terre Haute, Indiana

**A** We'll need a little more than 25 words, but here goes. The decibel (dB) is a unit of measurement of the ratio of two audio signals. For exam-

ple, a device's signal-to-noise ratio (the amount of signal compared to the amount of noise) is typically expressed in dB, as is the amount of gain through a system (i.e., the ratio between the system's output compared to the signal at the input). The decibel can also quantify level changes at a device's input or output; for example, you could increase the input level by a certain number of dB, or apply gain to a preamp to increase

the output level by a certain number of dB. Let's examine a device's signal-to-noise ratio as a way to explain the concept.

All electronic devices generate noise. Comparing a device's maximum available output signal to the amount of noise present at the output defines the signal-to-noise ratio, or S/N ratio for short. For example, if there's a 1 volt audio signal at the output of a multieffects, and the residual noise output is 1 millivolt (1/1000th of a volt), then your S/N ratio is 1000:1.

The decibel has a logarithmic curve to more closely follow the way the ear hears, which is very sensitive at low levels and less sensitive at high levels. Doubling the ratio of one voltage to another adds 6 dB (likewise, halving a voltage ratio subtracts 6 dB). For example, a ratio of 1000:1 corresponds to 60 dB; a 2000:1 ratio is 66 dB, a 4000:1 ratio is 72 dB, an 8000:1 ratio is 78 dB, and so on.

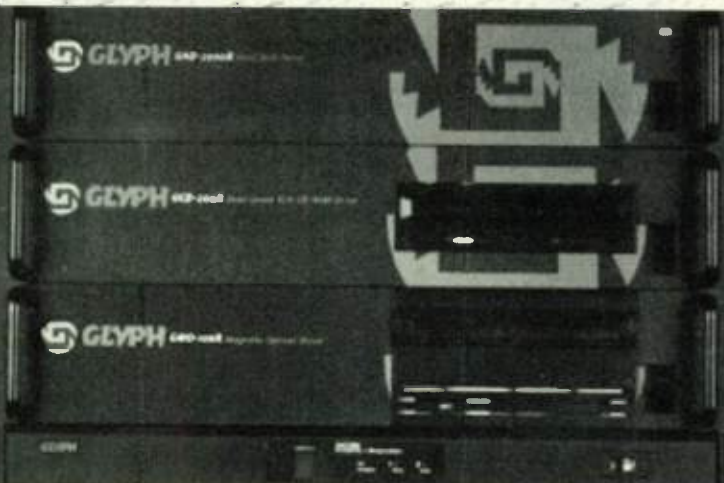
The larger the S/N ratio, the lower the noise. Many times the S/N ratio will be given as a negative number (such as -70 dB) since technically speaking, the noise is lower (hence the negative number) when referenced to the audio signal.

The decibel is also useful when applied to gain. If a preamp provides 6 dB of gain, that means the peak-to-peak output voltage is twice as much as the peak-to-peak input voltage.

The subject of decibels is quite complex, since there are different types of decibels used for different types of measurements. However, just remember that it expresses the ratio of one audio signal compared to another, and you'll have the basic idea.

Craig Anderton  
Technology Editor

# RACK EM' UP!



## Fast, Affordable SCSI Storage

### Hard Disk Drives • CD-ROM DAT Backup • Magneto Optical CD Recorders • SCSI Switches

Glyph provides industry leading, high speed SCSI storage solutions for digital audio recording, digital video and samplers. Rugged, fully tested, compatible solutions for professional studio, project studio and live touring applications

RACKMOUNT and DESKTOP ENCLOSURES - PLUG & PLAY OPERATION

800-335-0345

**GLYPH**



Glyph is Authorized  
Digidesign, Roland, and  
Kurzweil Developers.

Make Your Mark!

Glyph Technologies Inc.  
605 West State St.,  
Ithaca, NY 14850  
607-275-0345  
607-275-9464 Fax

This is where your questions get answered. Send your query with your name and address to:  
EQ Editorial Offices,  
939 Port Washington Blvd.,  
Port Washington, NY 11050  
Fax: 516-767-1745  
America Online: MPANDA



# TAKE TEN!



## **\$10 REBATES ON THE WORLD'S MOST POPULAR MICS: THE SM58 AND THE SM57.**

**FROM SEPTEMBER 1st THROUGH OCTOBER 31st:**

Great job everyone! Take five. Or better yet... take ten. Dollars that is. Back from the purchase of every SM58 and SM57 microphone.

You've helped make the SM58 and SM57 the world's #1 selling mics once again and we're rewarding you by giving you a ten dollar "break" on every one you buy.

But hurry. "Breaktime" ends soon.

### **Shure's "TAKE TEN" Rebates:**

To receive your rebate send: 1. A copy of your dated sales receipt (non-returnable) indicating model number(s) and name of store where mic(s) were purchased, 2. The actual silver model number label (no substitutions) from the end of each outer carton, and 3. This completed coupon to: Shure "TAKE TEN" Rebate Offer, 222 Hartrey Ave., Evanston, IL 60202-3696

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone \_\_\_\_\_  
Qty. purchased: SM58 \_\_\_\_\_ SM57 \_\_\_\_\_  
Age \_\_\_\_\_ Occupation \_\_\_\_\_

\$10 rebate applies to Models SM58-LC, SM58-CN, SM58S, SM57-LC and SM57-CN only. Rebates are limited to a total of six per customer, household, or organization. Offer valid only on consumer purchases made at retail between September 1, 1994 and October 31, 1994. Rebate claim forms must be postmarked no later than November 30, 1994. This is a consumer (end user) offer only. Shure microphone distributors, retailers or their employees are not eligible for rebates, nor may Shure microphone distributors, retailers or their employees claim rebates on behalf of consumers (end users). Rebate requests not including proper documentation (official coupon, silver model number label from end of carton, and dated sales receipt with retailer's name) will be returned as incomplete. Shure is not responsible for late, lost, or misdirected mail, insured or certified mail is recommended. Offer good only on purchases made in the U.S.A. and open to U.S. residents only. Void where taxed or prohibited by law. Allow 6 to 8 weeks for delivery of rebate check. Coupon face value 1/4¢. Rebate eligibility as determined by Shure is final.

**SHURE®**  
The Sound of the Professionals®...Worldwide.

CIRCLE 63 ON FREE INFO CARD

World Radio History



# EQ AES PREVIEW

## CLEAN UP YOUR ACT

**d**bx's Project 1 286 microphone processor provides a mic preamp, compressor, de-esser, spectral enhancer, and expander/gate — all of which may be used in any combination. The preamp features input gain control, phantom power, and an 80 Hz high-pass filter. The unit's de-esser has been designed to effectively remove vocal sibilance and high-frequency distortion in cymbals, while the HF detail control of the enhancer may be used to add sparkle and crispness to tracks. For more details, contact dbx, 8760 S. Sandy Pkwy, Sandy, UT 84070. Tel: 801-568-7660. Circle EQ free lit. #101.



## Z-WHIZ

**Z**-Systems has announced the introduction of the z-8.8 digital audio router/switcher/distribution amp. Housed in a 2-rack unit chassis, the z-8.8 receives and transmits eight lines of digital audio. The z-8.8 is capable of broadcasting any input to multiple outputs, channel selection between multiple inputs to a single output, and arbitrary routing patterns, all simultaneously. The z-8.8 has separate input and output modules, either of which can be equipped with any combination of transformer-isolated XLR, transformer-isolated coaxial or plastic fiber-optic connectors. Regardless of the configuration, the unit automatically translates formats to match the connector type. The routing pattern is controlled from the front panel, has presets, and retails at a price of less than \$1000. For more information, contact Z-Systems, 4641-F N.W. 6th St., Gainesville, FL 32609. Tel: 904-371-0990. Circle EQ free lit. #102.



## TUBE JOB

**P**eavey has introduced the VMP 2, a new 2-channel vacuum tube mic preamp. The heart of the VMP 2 design is three sections of the popular 12AX7 vacuum tube with a unique input transformer design with triple magnetic shielding and a frequency response of 10 Hz to 40 kHz to provide more than 65 dB of gain at the microphone input. Peavey's included both high and low shelving-type EQ on the front panel. For more information contact Peavey, 711 A St., P.O. Box 2898, Meridian, NS 39302. Tel: 601-483-5376. Circle EQ free lit. #103.

## EXPAND YOUR HORIZONS

**M**ackie is introducing the 24-E 24-Channel Expander Console. The optional 24-channel expansion board allows owners of Mackie 32-8 and 24-8 mixing consoles to expand input channel capacity at a modest cost. The 24-E is essentially the same as a 24-8 console but without the master section, providing 24 full-featured input channels plus an additional 24 tape returns. Retail price is \$2995 and the meter bridge is \$695. For more information, contact Mackie, 20205 144th Ave. NE, Woodinville, WA 98072. Tel: 206-458-3838. Circle EQ free lit. #104.



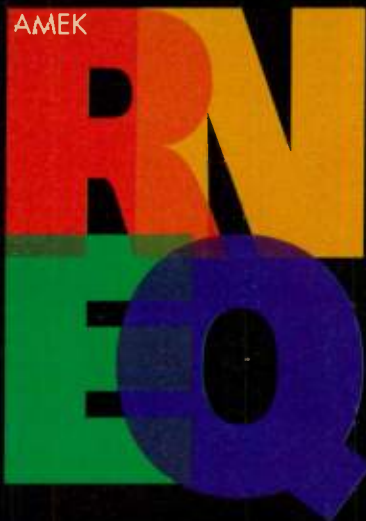
## ROUND FOUR

**A**lesis has introduced the Midiverb 4 dual-channel parallel processor with auto level sensing. This latest incarnation offers new sounds and capabilities. Based on an entirely new electronic design, it is a true dual-channel unit that will operate as a stereo or two independent mono units. A backlit LCD screen and value dial makes editing and writing your own effect programs easier. Auto level sensing automatically sets the optimum input level. Midiverb 4 features a 48 kHz



sampling rate and 18-bit oversampling converters, with 20-bit internal resolution — giving the unit a frequency response of 20 Hz – 20 kHz and a dynamic range of 90 dB. There's a lot more the Midiverb 4 has to offer. To find out more, contact Alesis, 3630 Holdrege Ave., Los Angeles, CA 90016. Tel: 800-5-ALESIS. Circle EQ free lit. #105.





# The EQ

## The tradition

## The pedigree

*"The SYSTEM 9098 EQ is a high performance Equalizer and Preamplifier designed to originate microphone signals of the highest quality and to process signals generally in terms of frequency response. The circuitry is based on the research I put into the 9098 console and the approach bears many similarities to that used in the 9098. Paramount importance has been given to the sonic quality of the audio path, taking great care to retain the highly-prized musical character of the famous old designs of this pedigree."*

*The SYSTEM 9098 EQ embodies the original curve shapes now enhanced by improved circuitry which provides swept frequency bands in place of the discrete switched steps of the past. Thus the EQ has become even more powerful yet remains a subtle and creative tool, using the same basic circuit configurations which have been successful over many years. However, new amplifying devices and better quality components have resulted in lower noise, lower distortion and the ability to handle higher frequencies."*

*The result is an equalizer which has the solidity and sound of Class A without the cost, heat and weight penalties and thus provides the 'best of both worlds'. We have also left behind cumbersome and expensive hand cabling, noisy connectors, heavy separate power supplies and outdated assembly techniques which contribute nothing but nostalgia. Apart from the robustness, repeatability and reliability, we have now made one of my designs more affordable than ever before."*



Rupert Neve



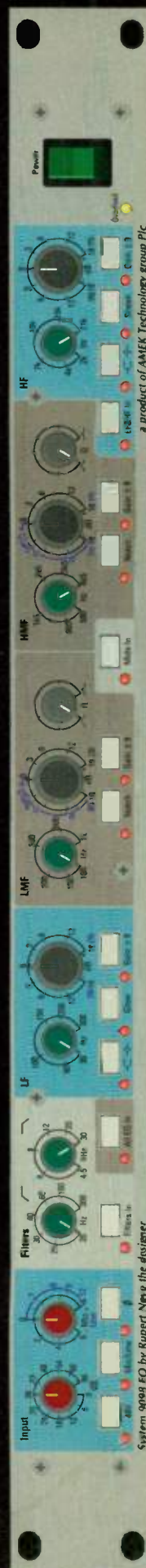
**Head Office, Factory & Sales:**  
AMEK Systems & Controls Ltd.  
Regent Trading Estate,  
Oldfield Road, Salford M5 4SX, UK  
Tel: 061-834-6747.  
Telex: 668127.  
Fax: 061-834-0593.

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

**AMEK Germany:**  
Vorstadt 8  
D-55411 Bingen  
Germany  
Tel: 06721 2636.  
Fax: 06721 13537

**AMEK Systems & Controls Asia:**  
Singapore Representative Office  
Orchard P.O. Box 0655  
Singapore 9123  
Tel: 65 251 1629  
Fax: 65 251 1297

CIRCLE 06 ON FREE INFO CARD





# EQ AES PREVIEW

## THE POSITIONER

**S**tudio Techniques is offering the first remote-controlled microphone positioning device. The Positioner consists of a motorized microphone mount and a remote control box that you use to physically manipulate almost any microphone in two axes from the listening position. With the Positioner, you have the ability to remotely move the microphone relative to a piano, drum, guitar amp, etc., and hear the results instantly, eliminating trips back and forth repositioning the mic. For complete details, contact Studio Techniques, 100 Mill Plain Rd., 3 Fl, Danbury, CT 06811. Tel: 203-791-3919. Circle EQ free lit. #106.



## SOUND FOR THE BIG PICTURE

**A**pogee Sound and the THX division of Lucasfilm have introduced Motion Picture Theater System One (MPTS-1), a loudspeaker monitoring system especially suited to mixing and evaluating sound for film and video. The system is triamplified for left, center, and right screen-associated loudspeakers and also includes a subwoofer. The main channel system consists of two enclosures, one housing the system's woofer and one housing both midrange direct radiator drivers, a high-frequency horn, and compression driver. The MPTS-1's direct field response is set to the standard "X" curve of ANSI SMPTE Standard 202M-1991 and TSO 2969, and the directivity of the system is controlled by matching the dispersion of the elements at each of the crossover frequencies. This advantage means that both the direct field response, or first arrival, and the later arriving reflected and reverberant energy of the listening room are minimally affected by abrupt changes to directivity. For complete details, contact Apogee, 1150 Industrial Ave., Petaluma, CA 94952. Tel: 707-778-8887. Circle EQ free lit. #107.

# IF SILENCE IS GOLDEN, THIS CO!



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





## POWER TRIO

**T**he new P1500, P2500, and P3500 power amps from Yamaha offer reliability and flexibility. The amps offer 150, 250, and 350 watts per channel, respectively. They feature two-speed forced-air cooling and an advanced circuit protection system that includes power-on output muting and DC and thermal sensing for power. For further information, contact Yamaha, P.O. Box 6600, Buena Park, CA 90622-6600. Tel: 714-522-9011. Circle EQ free lit. #108.

## ZOOMIN' ALONG

**Z**oom has just introduced the 1202 Zoom Studio, a reverb/multi-effects proces-

sor that offers 512 parameter-adjustable presets (32 different types of effects with 16 variations each), true stereo operation, 2-octave pitch shift, 2-band EQ, and more — all for \$250. The 1U Studio features powerful effects algorithms culled from the manufacturer's high-end processors. And it's quiet — sampling rate is 44.1 kHz and the Studio features 24-bit internal processing. It includes 16 different reverbs, delays and gates along with 16 modulation effects including chorus, flange, tremolo, pitch-shift, and others. The Studio is a true stereo/dual-mono device. For more information, contact Samson Technologies, P.O. Box 9068, Hicksville, NY 11802-9068. Tel: 516-932-3810. Circle EQ free lit. #110.



## THE ART OF SIGNAL PROCESSING

**A**ppplied Research and Technology (ART) is introducing a new line of signal processors. The X-12 MIDI master controller has the same interface and operation as the X-11 with the addition of extended preset recall and an external pedal input. The CS2 dual compressor/limiter with noise gate offers two channels of compression or limiting in a 1U space. It has balanced ins and outs and A.R.T.'s Tube Emulation Circuit. The DXR Elite digital delay is a fully programmable 16-bit processor that offers all types of delay-based effects and A.R.T.'s Dual Processing. The RXR Elite digital reverb features new reverb algorithms, based on A.R.T.'s proprietary Acoustic Room Modeling and a Variable Filter Network that allows you to instantly modify the characteristics of the listening environment. For further information, contact A.R.T., 215 Tremont St., Rochester, NY 14608. Tel: 716-436-2720. Circle EQ free lit. #109.



# CONSOLE SHOULD COST 7486% MORE

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

Gingerly, they listen, to not much at all.

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

Of course, a D&R is much more than the quietest analog

board you can buy. So we equip each handcrafted D&R with dozens of unique, high-sonic-performance features. And we back each board with our renowned factory-direct technical support.

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

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

# D&R

D&R ELECTRONICA B.V.

Rijnkade 15A, 1382 GS Weesp, The Netherlands  
tel (+31) 31 2940-18014 • fax (+31) 31 2940-16087

D&R WEST: (818) 291-5855 • D&R NASHVILLE: (615) 661-4892  
D&R SOUTHWEST: (408) 756-3737 • D&R USA: (800) 588-3411

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

CIRCLE 19 ON FREE INFO CARD



# EQ AES PREVIEW

## NEUEST NEUMANN

**N**eumann is introducing a brand new mic, the KM 184. It's a small diaphragm, cardioid condenser mic designed for critical recording and sound reinforcement applications. The KM 184 combines the capsule from the famous KM 84 microphone and the transformerless electronics of the KM 100 series. Specifications include 138 dB maximum sound pressure level, 16 dB A-weighted self-noise, and frequency range of 20 Hz to 20 kHz. The preliminary retail price of the KM 184 will be less than \$600. For additional information, contact Neumann/USA, 6 Vista Dr., P.O. Box 987, Old Lyme, CT 06320. Tel: 203-434-5220. Circle EQ free lit. #111.



## KEY PLAYER

**K**urzweil recently introduced the PC88-MX performance controller keyboard. It combines the ease of a portable digital piano (including a full 88-key keyboard) with the power of a MIDI master controller. The PC88-MX features 64-note polyphony, 269 internal sounds, two independent digital multieffects processors, General MIDI compatibility, and storage for 128 user setups. There are three banks of 205 preset sounds. The PC88 MX is 16-part multitimbral and can transmit on four MIDI channels simultaneously. Any internal sound can be layered or split with up to four other internal voices and external MIDI instruments. The keyboard has a two-piece weighted action, yet the device weighs just 50 pounds. Retail price is \$2750. For more information, contact Kurzweil/Young Chang, 13336 Alondra Blvd., Cerritos, CA 90703. Tel: 310-926-3200. Circle EQ free lit. #112.



## ALL THINGS BEING EQUI

**E**qui-Tech has released a new line of electrical isolation systems for project studios. The technology behind the new products is brand new. The units employ a critically balanced isolation transformer that provides a standard 120 volt output but with 60 volts to ground on each output leg. By balancing the power source, hum noise, video hum bars, and other objectionable forms of AC-related background noise simply null out at the grounding reference. For more information contact Equi-Tech, P.O. Box 249, Selma, OR 97538. Tel: 503-597-4448. Circle EQ free lit. #113.



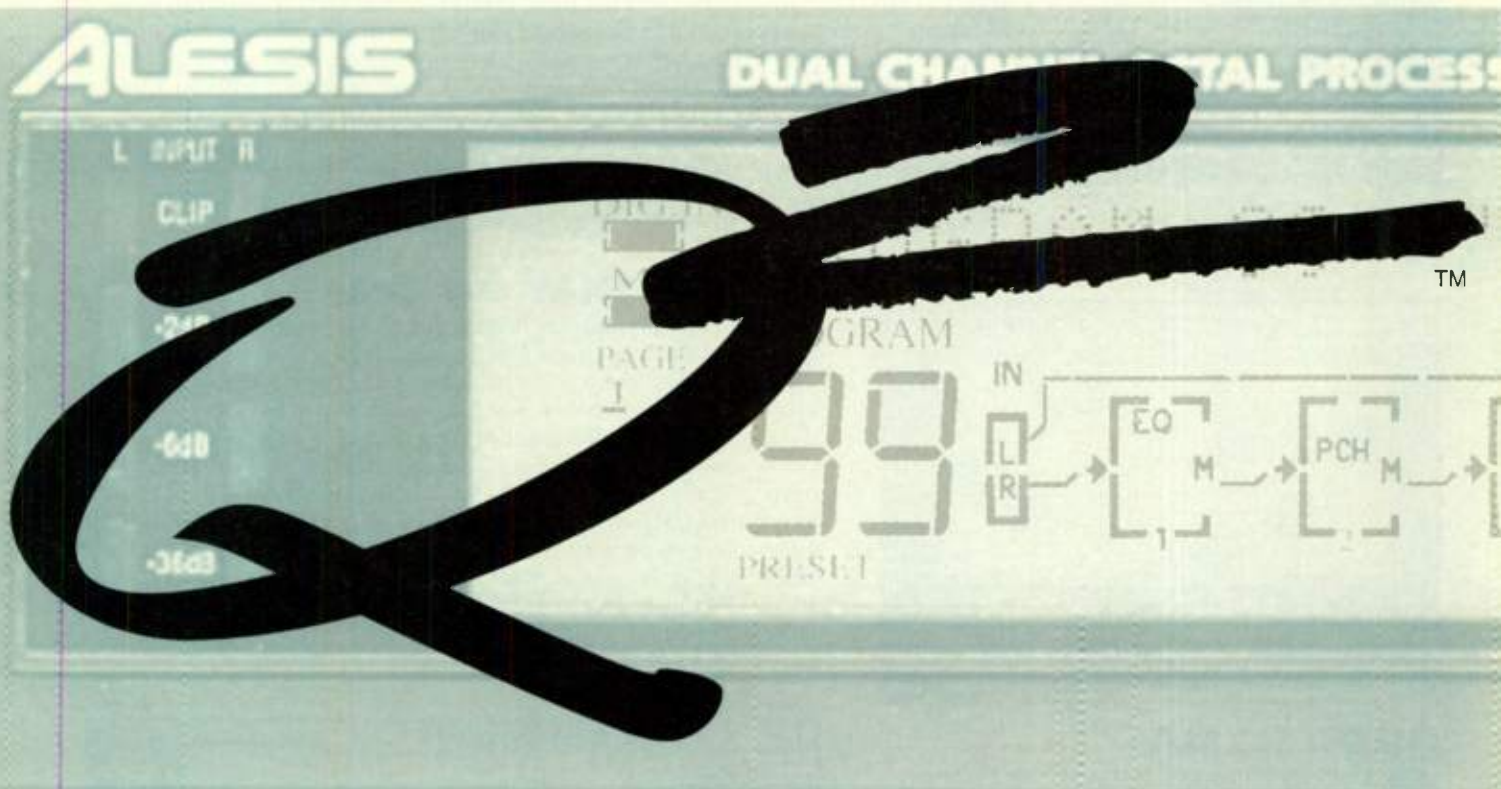
## IF YOU'RE GOING TO SAN FRANCISCO...

Some things you'll see while you're at the AES Convention in November...Be sure to get to the Moscone Center early this year — you won't want to miss the convention's keynote speaker, legendary producer, engineer, and studio owner **George Martin**...**Soundtracs** will be showing an impressive range of consoles at AES. These will include the 8-bus Topaz, the modular, automated Solitaire, the Sequel II PA desk, and the Megas II Stage and Megas II Monitor...**Peavey** will be featuring and focusing mainly on its Media Matrix system, but don't be surprised if you see some new gear at the booth...This year **beyerdynamic** will introduce several new products including the MPC 65 cardioid boundary effect mic, the NE 700 two-channel UHF diversity receiver, and DT 200 series headphone and headsets...You've heard about it, now see it for yourself — the **Yamaha** ProMix 01 under \$2000 digital mixer. While you're at the show, grab a copy of EQ's November issue for Roger Nichols's take on this much-ballyhooed board...There are eight Technical Tours scheduled at this year's AES, including walk-throughs at **Digidesign**, **Meyer Sound Laboratories**, **Dolby Laboratories**, **Silicon Graphics**, and the **San Jose Arena**...Get some recording tips from **Bruce Swedien** at the NARAS Recording Forum taking place on Friday, November 11 at 2:00 PM...**E-mu Systems** will be introducing the ESI-32 digital sampling instrument. It's a 32-voice digital sampler featuring Emulator IIIx audio resolution at an entry-level price point. It offers 32 MB of RAM and seamless compatibility with Emulator IIIx, Emax II, and Akai S1000...**Alesis** will be premiering two new power amps, the Matica 500 and Matica 900. Their power varies with loads of course, but at two-channel operation into 8 ohms, they provide 162 watts and 270 watts, respectively...EQ publisher Paul Gallo hosts "An Interview with Paul Klipsch" on Friday, November 11. The always-outspoken Klipsch will be sure to offer his insightful — and entertaining — opinions...**Akai** has released a new software upgrade with a modification kit for the CD3000 sampler that adds more flexibility to the acclaimed machine. The upgrade is Version 1.6 and the KIT-CD3000...The AES will have 14 workshops taking place during the convention covering a wide area of industry-important topics including "Alternative Media Formats," "Audio and Multimedia," "3D Stereo Sound," and "Developments in Data Compression"...Take a walk on the wild side and see something a bit on the high-end, **Cadac**'s new live console, the Concert. Known for their theater consoles, U.K. manufacturer Cadac is now offering this board for live concert work. It's making its U.S. debut at booth #106.



IN 1947,  
CHUCK YEAGER BROKE THE  
SOUND BARRIER.

IN 1994,  
ALESIS ANNIHILATES IT.



K E E P Y O U R  
E A R S O P E N

Q2 is a trademark of Alesis Corporation.

**Alesis Corporation** 3630 Holdrege Avenue Los Angeles CA 90016  
Phone: 1-800-5-ALESIS  
(In North America only) e-mail: ALECORP@Alesis1.usa.com



CIRCLE 05 ON FREE INFO CARD

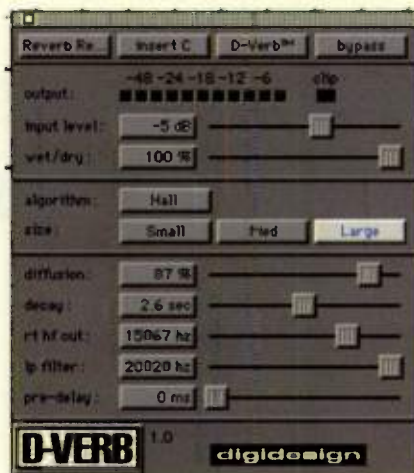
World Radio History



# EQ STUDIOWARE

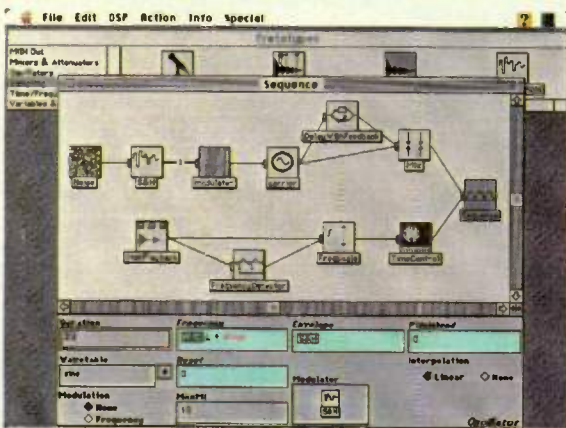
## PLUG-IN FOR PRO

**D**-Verb is Digidesign's newest plug-in for the Pro Tools/TDM bus recording and editing environment that provides high-quality reverberation effects on a single Digidesign DSP Farm chip. D-Verb allows easy on-screen editing and program storage, and the ability to run multiple reverb processors for the price of one software plug-in. D-Verb features 24-bit internal processing resolution, seven algorithm presets with adjustable parameters for size, predelay, decay time, diffusion, and so on. For more information, contact Digidesign, 1360 Willow Rd., Menlo Park, CA 94025. Tel: 415-688-0600. Circle EQ free lit. #114.



## TIMELY UPDATE

**K**org Professional Audio will be featuring SoundLink with Version 4.0 software at AES. Version 4.0 increases the basic system storage time to over 240 minutes. Over 30 operational enhancements have been made including additional edit functions, auto saving, take numbering, keystroke short cuts, and improved scrubbing. SoundLink combines an 8-track hard disk recorder/editor with an automated digital mixer with equalization and effects processing. Other functions include a 16-track MIDI recorder/sequencer and full synchronization to timecode and digital audio signals. Complete systems start at \$37,000. For further information, contact Korg, 89 Frost St., Westbury, NY 11590. Tel: 800-645-3188. Circle EQ free lit. #115.

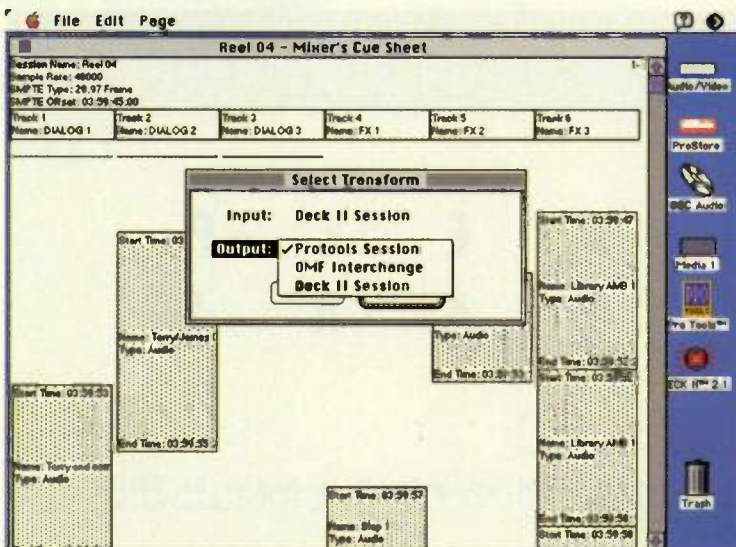


## GOOD KYMA

**S**ymbolic Sound will introduce a new version of Kyma, a computer-based sound synthesis and processing system at the AES Show. Kyma 4.0 allows you to program sounds and effects on multiprocessor DSP hardware using a graphic interface on Macintosh or Windows platforms. The Kyma system is an open architecture with reconfigurability of its software and hardware. Sounds are constructed out of graphic modules and any module can be connected to any other. A sound can be constructed out of any combination of synthesis, sampling, live input, or processing modules, including modules representing digital recordings stored on the hard disk of the host computer. For complete details contact Symbolic Sound. Tel: 217-355-6273. EMAIL: SymbolicSnd@pan.com. Circle EQ free lit. #116.

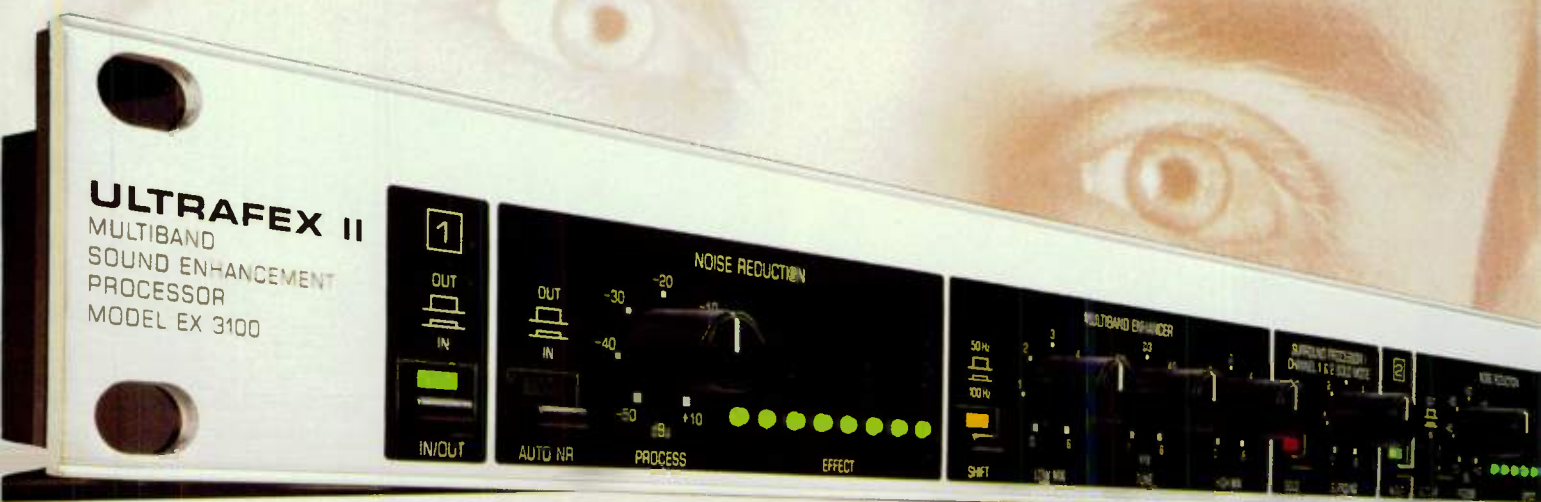
## THINGS THAT GO OMF

**O**SC is offering the first file exchange program for the Open Media Framework (OMF) project format. Already a new industry standard, OMF establishes a common file spec for multimedia session documents. You can save digital video clips and audio tracks, along with editing and mixing decisions as a "project," which can be moved to any number of digital workstations. Avid, Sonic Solutions, Studer Editech, AMS Neve and Synclavier have already announced OMF compatibility for their workstations. Trans•port: the audio workgroup utility, is an OMF conversion utility for Pro Tools and DECK II. It exchanges playlists and provides automation, sync references, and file locations between any of the three session formats. For more information, contact OSC, 480 Potrero Ave., San Francisco, CA 94110. Tel: 415-252-0367. Circle EQ free lit. #117.





**IF IT WEREN'T FOR BLIND AMBITION,  
THIS KIND OF SIGNAL PROCESSING  
SIMPLY WOULDN'T EXIST.**



### **Ultrafex II from Behringer: The First Enhancer with Stereo Surround.**

Only 32, Ulrich "Uli" Behringer has already produced a world-class line of signal processing encompassing over 20 ground-breaking products.

His new Ultrafex II is a typically innovative enhancement processor that adds more clarity, punch and excitement to your mixes. Its smooth, quiet Behringer audio performance can give your recordings the professional impact they've been missing.

As usual, Uli has come up with an incredible lineup of features for the Ultrafex, including Effect Solo, adjustable High and Low Frequency Processing, fully controllable Single-Ended Noise Reduction and *Stereo Surround* — something no one else has.

What can Stereo Surround do for your music? Difficult to describe in words, but a revelation

when you experience it in person (at your nearest Behringer dealer). It actually widens the stereo image to create an open, multidimensional sound panorama.

Quality-intensive throughout, the Ultrafex features fully balanced inputs and outputs with Tip-Ring-Sleeve and XLR *standard*, and is backed by a five-year warranty for parts and labor.

Ultrafex II. Another breakthrough from a man who will stop at nothing less than the very finest processing in audio.



### **THE PERFECT EAR.**

For more information about the full line of Behringer signal processing, please call (516) 932-3810, fax (516) 932-3815 or write to Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068.

Suggested retail price for Ultrafex II is \$349.99.

Behringer is exclusively distributed in the U.S. by Samson Technologies Corp.

© 1994 SAMSON

**CIRCLE 17 ON FREE INFO CARD**





Professional Digital Audio Tape Recorder

Panasonic

POWER

OFF — ON

HEADPHONES  
LEVEL

MIN

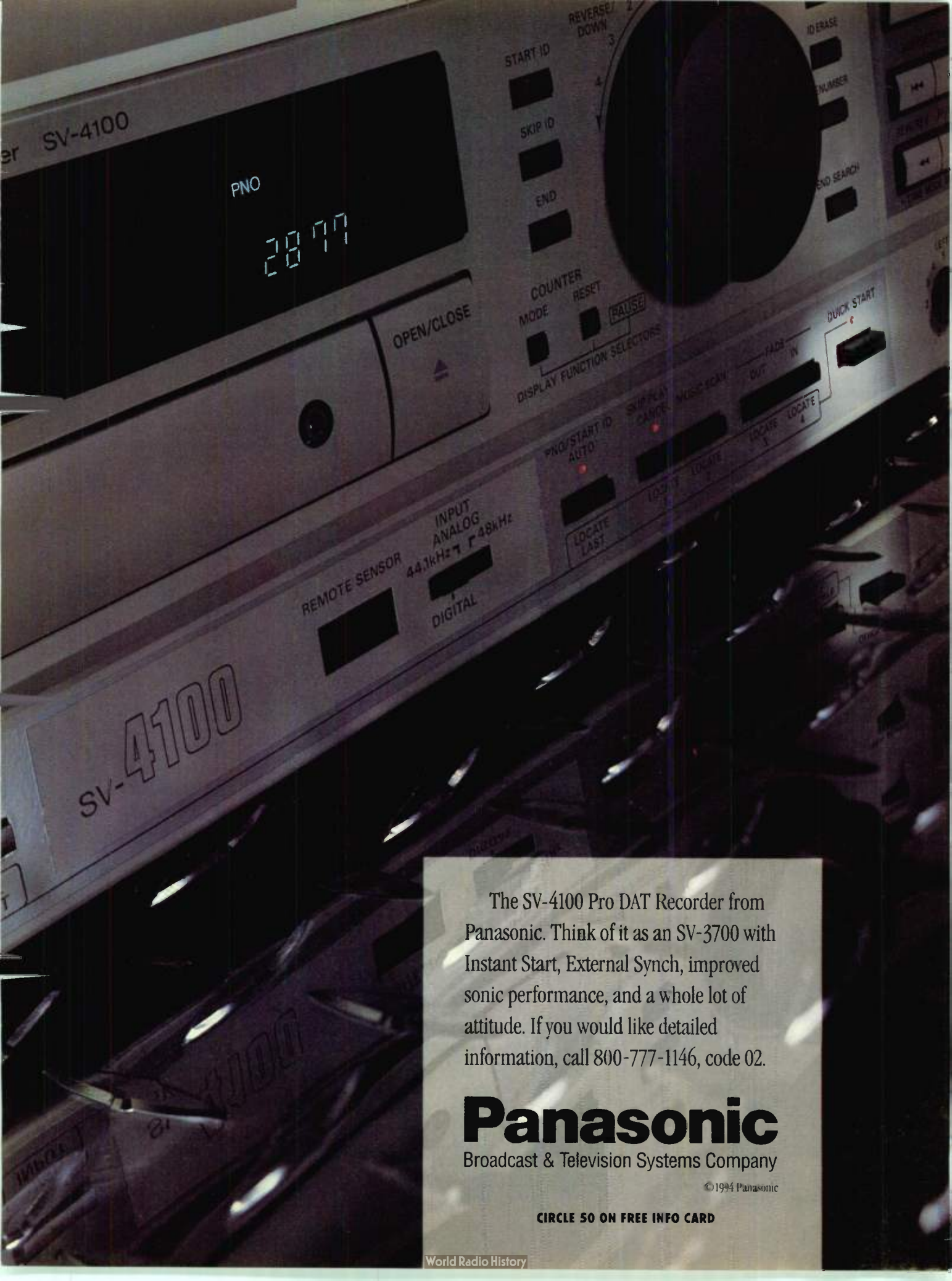
HEADPHONES

MODE —  
0-Fs OFF (INTERNAL)  
1-25 VIDEO 25  
1-29 VIDEO 29.97  
1-30 VIDEO 30  
2-Fs WORD SYNC  
3-Fs DIGITAL DATA

EXT SYNC

TIME  
INPUT





The SV-4100 Pro DAT Recorder from Panasonic. Think of it as an SV-3700 with Instant Start, External Synch, improved sonic performance, and a whole lot of attitude. If you would like detailed information, call 800-777-1146, code 02.

# Panasonic

Broadcast & Television Systems Company

©1994 Panasonic

CIRCLE 50 ON FREE INFO CARD



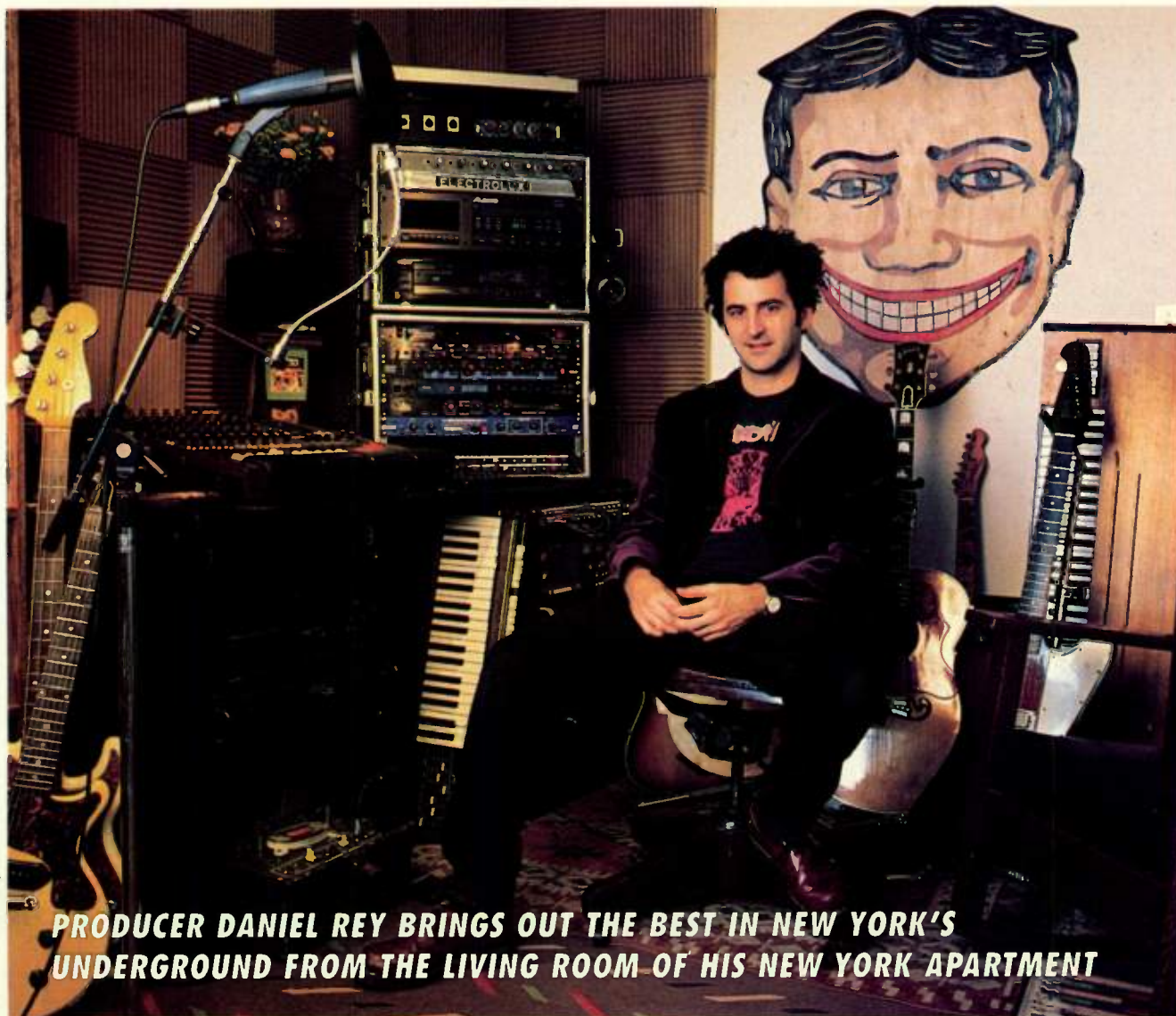
# You Can Call Him Rey...

**STUDIO NAME:** My Living Room  
**LOCATION:** East Village, New York  
**KEY PEOPLE:** Daniel Rey (owner)  
**BANDS RECORDED:** Ramones; Iggy Pop; Johnny Thunders; L7; White Zombie; and others  
**CONSOLE:** RAMSA 8210-A (Notes Rey: "Lousy EQ, but great crosstalk")  
**RECORDERS:** Alesis ADAT; Sony DAT machine; cassette deck  
**SPEAKERS:** AKG headphones ("A gift from my neighbors.")  
**MICROPHONES:** Shure SM57 and SM58; Sennheiser 421; Neumann U87  
**KEYBOARDS:** Moog Satellite Synthesizer; Yamaha DX7

**COMPUTERS & SOFTWARE:** Sharp YO-610 electronic organizer (128k)  
**OUTBOARD GEAR:** Yamaha SPX 90; Delta Lab DDL; Lexicon PCM60; dozens of old fuzz boxes ("Some even work")  
**COMPRESSORS:** dbx 160 and 166XT  
**MISCELLANEOUS:** Neve 1073 mic pre  
**EQUIPMENT NOTES:** Rey states: Anything that gets recorded goes through the Neve direct to tape.  
**STUDIO NOTES:** Rey continues: This setup is great for writing, making song demos and "no budget" overdubs, and "compiling" vocals or solos.

Here's how to maximize your recording dollars: Spend the money

on a great commercial studio and record the tracks you need, then make a 2-track stereo mix for the ADAT slave and go home to your project studio. In your studio, you can do your fine tuning; do the vocals and comps and work out the harmonies, bass parts, and guitar parts (I'll always have to go direct — remember that it is an apartment). Then go back to the commercial studio and dump it on the 24-track and mix it. With the money you saved you can afford to go back and record more songs — and *that's* really what it's all about. **RE**



**PRODUCER DANIEL REY BRINGS OUT THE BEST IN NEW YORK'S UNDERGROUND FROM THE LIVING ROOM OF HIS NEW YORK APARTMENT**

Photo by Julian Jaime





**Smooth sound, smooth frequency response, low distortion, & high quality components are a common element in every KRK speaker.**

The entire KRK line features the most advanced speaker and cross-over design to provide the smoothest, most natural sound possible. Whether it's the large Model 15A5, the moderate-sized Model 13000B, or the console-top Models 9000B, 7000B, or the very popular Model 6000, KRK has the perfect speaker for your needs.

***We know you'll be convinced. Demo a pair at your dealer today!***

**Group One Ltd.**

80 Sea Lane • Farmingdale, NY 11735  
Tel : 516.249.1399 • Fax : 516.753.1020

**West Coast Office**

Tel : 310.306.8823 • Fax : 310.577.8407

**KRK Monitoring Systems**

16462 Gothard Street • Unit E  
Huntington Beach, CA 92647  
Tel : 714.841.1600 • Fax : 714.375.6496

# EXTREMELY SMOOTH



CIRCLE 28 ON FREE INFO CARD

World Radio History



# Is That To Stay Or Go?

**STUDIO NAME:** Essential Recording

**LOCATION:** New York, NY

**MAIN MAN** Joe Mardin, owner

**CREDITS:** Anita Baker (arrangements, playing and programming on *Body & Soul*); Bebe and Cece Winans (coproduction and keys on *Relationships*); Carly Simon (coarrangement and keys); Manhattan Transfer with Phil Collins (live drums and drum loops); and many, many more

**CONSOLE:** Soundcraft 400B 16x4x2 analog totaling 28 inputs

**MONITORS:** Yamaha NS-10s

**AMPLIFIERS:** Crown D75

**RECORDERS:** Fostex B16 16-track with 4050 autolocator; Panasonic SV-3700 DAT; Sony DAT Walkman with digital interface; Yamaha C300 cassette

**SOFTWARE:** MOTU Performer; Opcode Galaxy+Editors; Harmonic Systems Studio Pal; Digidesign Sound Designer II and SoftSynth; Steinberg-Jones Cubase Audio

**MIDI:** Yamaha DX7 with Grey Matter Response E! v. 2.0A; Roland Pad 80 Octapad II

**EFFECTS:** Eventide H3000SE with Mod factory software; Lexicon PCM 70 v. 3.01; Yamaha SPX90; TC2290 digital delay; Boss SE-50 and effects pedals; Rockman Sustainer

**SYNTHESIZERS:** Ensoniq SQR; Yamaha TX 802 and TX 81Z; Roland MKS-80 with MPG-80 Programmer; Oberheim Matrix 1000 and X-Pander; Ensoniq ESQ-M; Roland D-110; E-mu ProFormance/1 Piano Module with longer decay chip; MiniMoog

**SAMPLERS:** Roland S770; Akai S1000

**SYNCHRONIZATION:** Jeanius Russian Dragon; MOTU MIDI Timepiece running FAST 1X

**MICS:** AKG C414B-ULS

**CD-ROMS:** Pinnacle Micro REO-650 magneto-optical drive; Sony CDP-1B CD-ROM drive

**STUDIO NOTES:** Mardin's studio consists of a stationary system and a number of racks (with too much gear to list here) that go with Mardin to whatever studio he works at. Mardin states: My studio is somewhat analogous to a Macintosh Duo Dock computer: A stationary multi-

track setup serving as a "dock" to a mobile array of four racks and two MIDI controllers interconnected via Edac El-Co connectors, MIDI cables and some proprietary connections. When

"Docked" I use my studio mainly for pre-production, song demos, and as a sketch pad when I score acoustic arrangements.

**RECORDING NOTES:** Mardin continues: As a synthesist, I try to unify the sonic and emotional depth and unsample psychoacoustic artifacts inherent to the acoustic experience with the other worldly possibilities of electronic sound creation. By this I do not mean the attempt at faithful re-creation of acoustic instruments via samplers and digital reverbs (this is useful when you cannot afford the orchestra), but rather trying to imbue sound produced by moving electrons with some of the properties that occur when sound is produced by moving air molecules. Even if I create a hard quantized and purely synthetic texture, I hope that because of my mind set and methods, the listener will still feel a sense of humanity from the music. **EQ**

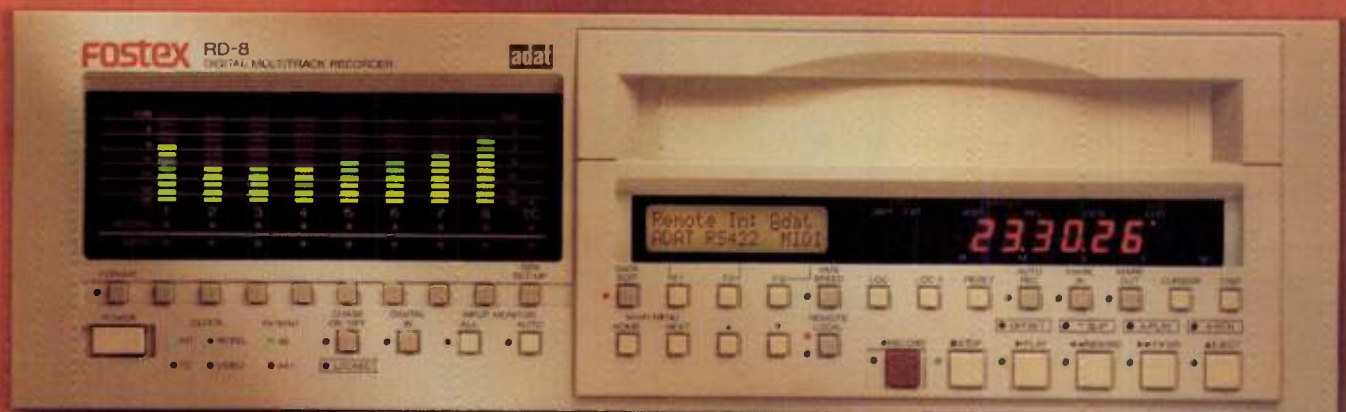
Photo by Julian Jaime



**PART PERMANENT AND PART ON WHEELS, PRODUCER/ENGINEER/SONGWRITER JOE MARDIN'S PROJECT STUDIO IS AS VERSATILE AS HE IS**



# THE RD-8. NOW PERFORMING AT A PROJECT STUDIO NEAR YOU.



“

## Audio for Video Projects

### Chris Taylor—Crossroads Studios

It can be sync'd to a 24-track for extra tracks; it can stand on its own for 8-track digital recording, as in our audio for video suite; it can be stacked with other RD-8s or ADATs™ for multitrack digital recording—and all without any extra hardware.

## Post Production Projects

### Brando Triantafillou—Editel, Chicago

We use it as the master machine with two ADATs for Post Scoring and Composition for commercial TV productions. I also like the fact that the Fostex RD-8 can act as a stand-alone digital recorder; it has the balanced time code inputs and outputs that I use with automation, and it has a really good layout of the front panel controls.

## The RD-8 Digital Multitrack Recorder

Whether you're working on the next hit movie soundtrack or the next hit, the RD-8 is right at home. Save key settings and locate points in the Table of Contents. Then, when you re-load your tape—into any RD-8—you can begin working right away. And if you're using MIDI, no other MDM gives you the breadth and depth of control that you'll find in the RD-8. It's the fully professionally machine that knows how to rock.

## MIDI Projects

### Frank Becker—Frank Becker Music

The computer sequencer and the RD-8 can be synchronized either by SMPTE with the RD-8 as master, or by MIDI Machine Control with the computer sequencer acting as master.

## Location Projects

### Paul Freeman—Audio by the Bay

We rolled twenty-eight 120 minute tapes of full field audio on the RD-8 in more dirt, more heat and more cows, for 18 days, with grime and a river, and the RD-8 never had a hiccup.

## Composing Projects

### Christopher Hoag—Composer

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

”

**Fostex**

CIRCLE 34 ON FREE INFO CARD



# Microtech Gefell UM 92 S

History repeats itself with  
this new tube mic

**MICROPHONE NAME:** Microtech Gefell UM 92 S

**VALUE:** \$2495; EA 92 shock mount: \$275

**TYPE OF MIC:** Dual element vacuum tube condenser

**POLAR PATTERN:** Cardioid, figure eight, omnidirectional

**FREQUENCY RESPONSE:** 40 Hz–18 kHz (no tolerance stated)

**SENSITIVITY:** 15 mV/Pa at 1 kHz

**OUTPUT IMPEDANCE:** 200 ohms

**SIGNAL TO NOISE RATIO:** CCIR weighted: 66 dB; A-weighted: 77 dB, 1 kHz @ 1 Pa

**DYNAMIC RANGE:** 103 dB

**MAXIMUM INPUT SPL:** 120 dB for a maximum THD of 0.5%

**POWER REQUIREMENTS:** 120 Volts DC via UN 920 power supply (included)

**TUBE:** EC 92

**DIMENSIONS:** 190 mm long, 42 mm body diameter

**MIC NOTES:** The UM 92 S features the Neumann-developed M 7 microphone capsule that was used in classic mics such as the U47, U48, and M49. This capsule features two large-diameter, gold-sputtered plastic membranes that are used to capture the audio waveform. When combined with the vacuum tube amplifier in the UM 92 S, the M7 provides the warmth of a vintage mic and the reliability and low noise of a modern design. Polarity switching is accomplished remotely on the UN 920 power supply, allowing the engineer to change the pickup pattern of the mic without disturbing its position. The power supply connects to the mic via a 7-pin Touchel connector and a standard 3-pin XLR connector provides output to the console.

While the UM 92 S is frequently used for vocals, its lack of coloration makes it suitable for recording acoustic instruments such as piano, guitar and horns.

**USER TIPS:** The EA 92 elastic suspension actually screws into the back end of the microphone, avoiding the possibility of damage to the mic from an unexpected fall.

EQ



Photo by Ed Colver



# GENELEC®



**The New  
Genelec 1030A.  
\$1,998.<sup>00</sup> pr.**

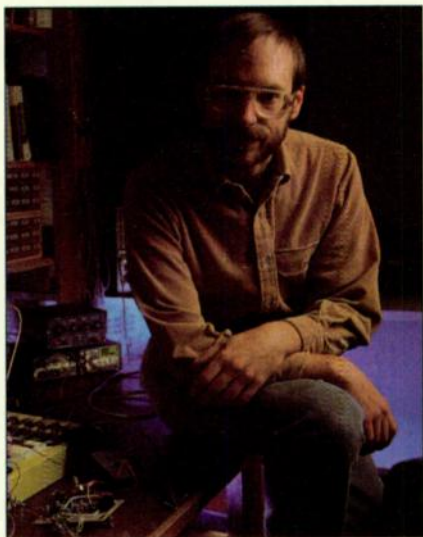
Distributed exclusively in the USA by  
**QMI** 25 South Street Hopkinton, MA 01748  
Tel 508-435-3666 Fax 508-435-4243

CIRCLE 62 ON FREE INFO CARD

World Radio History



# Point/Counterpoint: IBM vs. Apple



## Which musical computer platform is best for your studio?

BY CRAIG ANDERTON

One of the endless debates concerns IBM vs. Mac/PowerPC. Is one computer family really better suited to music than the other? We cornered two evangelist nerds, supplied them with Pepsi and pizza, and turned on the tape recorder. You be the judge.

**PC:** For someone who always thought the music world revolved around Apple, maybe you're finally ready to recognize that the PC is taking over.

**Mac:** Not so fast. Granted there're ten PCs out there for every Mac or PowerPC, but music magazine reader surveys consistently show Apple machines and PCs as pretty much even. Obviously, the music business knows a better computer when they see one.

**PC:** Once musicians realize how much more cost-effective the PC platform is, they'll forget Apple.

**Mac:** That's no longer true. Apple's price cuts mean the new PowerPC models are competitive with

equivalent Pentium machines.

**PC:** But there's more to life than CPUs. Peripherals and software for the PC are less expensive too, because the market size fosters competition.

**Mac:** The only reason there are so many PCs is because of the zillions of clones. And that's resulted in chaos — the Mac is a unified platform with similar programs. With the PC, you have to be a rocket scientist just to get a soundboard working.

**PC:** Okay, so a bunch of yuppies and artists weren't bright enough to figure out DOS and needed cute little icons. That's still not much of a market, and history shows that minority computers don't last — Commodore's out of business and Atari's concentrating on game machines. Eventually Apple computers will be orphans.

**Mac:** People have been saying Apple was doomed ever since it started. Besides, Apple's operating system is superior, and with hardware being roughly equivalent for both platforms, the software makes the difference.

**PC:** Wait until Windows 4.0 comes out. It's so Mac-like there won't be any advantage to getting a Mac. And in the long run, the IBM/Apple Taligent partnership will blur OS differences, anyway.

**Mac:** But while Windows 4.0 tries to catch up with System 7.1, Apple has already introduced System 7.5 and has 8.0 waiting in the wings, with intelligent assistance, multitasking, and a lot more. Windows will always be playing catch-up.

**PC:** There are areas where Apple's playing catch-up, too — for example, in multimedia. The MPC standard means you'll see far more titles developed for the PC than for the Mac or PowerPC.

**Mac:** In some major markets, though, up to 50 percent of MPC-compatible systems are being returned. People are discovering that configuring the PC platform is a nightmare. After enough disk crashes and incompatibilities, many PC owners are so frustrated they go back to their word processors and spreadsheets.

**PC:** I'm glad you mentioned that. Musicians don't just use computers for music, and the available selection of IBM software and hardware dwarfs that for the Mac. Everything costs less, too.

**Mac:** Okay, but let's return to music. There's no PC equivalent of the OMS/Galaxy/StudioVision type of system with tightly integrated digital audio, sequencing, and synthesis.

**PC:** So what? On the PC, you can get digital audio, synthesis, and sequencing on a card for \$500 or so. For high-end digital audio there's Spectral Synthesis, SADiE, Session 8, MTU Microsound, Soundscape, SAW, and a bunch more. Who cares about the PC's operating system? Once you boot the program, the point is moot.

**Mac:** I'll admit the PC is more of "the people's computer." The Mac has always had a scent of elitism around it, but that's just because it's better.

**PC:** Cuter, yes. Maybe even a smoother operating system. But where's Apple's commitment to music? MIDI Manager is a joke that no one uses. The Mac's popularity for music owes more to visionary third-party developers than to Apple.


**Mac:** Don't forget that Apple was constrained by the Beatles' lawsuit...

**PC:** That suit was settled a while ago, yet Opcode still has to clean up after Apple so that PowerPCs and PowerBooks can just do basic MIDI I/O. IBM's music division realizes how important music is; Apple's just getting MIDI into QuickTime.

**Mac:** Maybe, but had the Mac not come along, would we have as many musical tools as we do now? Artists weren't attracted to computers until the Mac spoke to them in a graphic language they could understand. Working with the Mac is comparatively easy; even tech experts struggle to get PC multimedia systems to perform as advertised. What's Joe Consumer going to do?

**PC:** The bottom line is simple: Joe Consumer votes with his wallet, and the voting has been for the PC. As long as there're more of them, there will be more of an incentive for software developers to court that market, more advancements made to the platform, and massive third-party support.

**Mac:** But really, who cares? Within five years, you won't be able to tell Macs and PCs apart anyway.

**PC:** You know, Mac, I think we finally agree on something. 



# DIGIDESIGN'S MOST AFFORDABLE 8-TRACK SYSTEM.



## Introducing the new 882 I/O™ for Session 8™—The break you've been waiting for.



If you've been wanting to get into a hard disk recording system but the price was a bit steep, we've got some great news for you.

Because with the new 882 I/O, you can now get into Digidesign's revolutionary Session 8 system for about \$1,000 less. (Yes, you read that correctly.)

Imagine: 8 tracks of crystal clear digital audio. Random access digital editing. Digital track bouncing and stacking. And unparalleled MIDI compatibility. All for a price that compares very favorably to tape.

How did we do it? By creating a new audio interface that pairs the original Session 8's excellent AD/DA converters with a streamlined layout (8 ins, 8 outs, stereo mixdown, single-rack space design). Hook up the 882 I/O to your mixer and you have a complete system with the same sparkling sound quality that's made Digidesign famous.



882 I/O front panel



882 I/O back panel

### SOUNDS COOL, RIGHT? IT GETS EVEN BETTER.

Session 8 is now more compatible than ever. Here is just some of what's new. Call us for the latest!

- **Sequencer Support for Session 8** (EMAGIC™, MOTU™, Opcode™, and Steinberg™)
- **New Digidesign ADAT® Interface\***
- **New Sound Designer™ II\*\***
- **New DINR™ Noise Reduction System\*\***
- **New MasterList CD™\*\*\***

**FOR INFORMATION ON YOUR NEAREST DIGIDESIGN DEALER,  
TO SCHEDULE A DEMO, OR TO RECEIVE PRODUCT LITERATURE.  
CALL 1.800.333.2137 EXT.115**

**digidesign**

• 1360 WILLOW ROAD • MENLO PARK •  
CA • USA • 94025 • 415.688.0600  
EUROPE (LONDON) • 44.81.875.9977

All trademarks and registrations are the property of their respective holders. © 1994 Digidesign. All rights reserved. \*PC only at present time. \*\*Macintosh only. Alesis and ADAT are registered trademarks of Alesis Corporation; used with permission. The Digidesign ADAT interface is a product of Digidesign, Inc., and is not a product of Alesis Corporation.

World Radio History

**CIRCLE 30 ON FREE INFO CARD**



**We** get a lot of calls from folks asking about who's using Mackie 8•Bus Recording/PA consoles.

Good question. After all, a board's only as good as its users.

So we grabbed the latest stack of 8•Bus Warranty Registration cards and hit the phones.

The names in this ad represent a cross section of current 8•Bus users. They range from platinum supergroups tracking new albums to high school choirs, from bar bands to sound designers working on network TV series and feature films. There'd probably be more names but we didn't want to make the type any smaller than it already is — or keep tying up our already clogged phone system.

As our production of 8•Bus boards increases, so does this list.

In a way, it's confirmation of the raves that magazine reviewers have heaped upon the console. Above all, it's proof that the Mackie 8•Bus is a serious tool for professionals. A tool that's getting used day-in and day-out for major projects.

Call our toll-free literature line 8AM-5PM PST and talk to a genuine Mackoid (no voice mail!). We'll send our obsessively-detailed 24-page color brochure on the 8•Bus Series.

Then become a part of this list by visiting your nearest 8•Bus dealer.



**Currently in Spain tracking new album on multiple Mackie 24•8 consoles.**  
Def Leppard

**Sound design & mixing of commercials for G.I. Joe, Kenner Toys, Hasbro Toys, Transformers 1/2-hour show, infomercials.**  
Lawrence Wakin • Tapestry Productions Inc. • New York, NY



**Tracking for Madonna.**  
Shep Pettibone • Mastermix Productions Ltd. • New York, NY

**Recorded Grammy-Nominated "Sunday Morning" off of the album Millennium on 24•8, currently working on new album exclusively on console.**  
"The 24•8 survived the 7.1 San Fernando Valley earthquake. It's definitely built for rock 'n' roll."  
Sheldon Reynolds • Earth Wind & Fire • Los Angeles, CA

**Music scoring for Pepsi Cola and McDonalds and Six Flags TV & radio commercials.**  
The Listening Chair • Dallas, TX

**Recording and mixing of acoustic music & sounds from the American West. Recent albums include "Charlie Russell's Old Montana Yarns" by Raphael Cristy and "Where the Red-Winged Blackbirds Sing" by Jim Schulz.**  
Bruce Anfinson • Last Chance Recordings • Helena, MT

**Pizza Hut commercial scored to film, scoring of theme presentation for The Baseball Network, self-produced album "Rick DePofi and the Mels," currently producing NY Noise's 1st solo artist, Aaron Heick (Chaka Kahn's alto player).**  
Rick DePofi & Craig Bishop  
New York Noise • New York, NY

<sup>1</sup> Former posts include quality assurance with Warner Brothers, Sheffield Labs, Rainbow

# OUR 8•BUS REALLY

**Concert sound reinforcement at the Showcase Theater.**

Bob O'Neill, Manager of Entertainment • Six Flags Great Adventure Theme Park • Jackson NJ

**Used by students for learning recording and sound design.**

The School of The Art Institute of Chicago, Sound Department  
Chicago, IL

**Jazz choir sound reinforcement and recording.**

Dwayne Pedigo • Plano East Senior High School • Plano, TX

**Sound effects, music and voice for Atari arcade games.**

Brad Fuller • Atari Games Corporation • Milpitas, CA



**Tracking for R&B and rap groups including vocals for Polydor artist T. Max.**

Brad Young & Dow Brain  
Underground Productions  
Boston, MA



**Dialog editing for "Untouchables," TV series and Movies of the Week. "I work out of my home now. It's quite an achievement to be able to get a higher sound quality than most of the other sound houses in town."**

3-time Emmy winner David Scharf  
Helix Sound • Los Angeles, CA

**Wide range of multimedia projects including major motion pictures (the names of which can't be divulged).**

John Acoca¹ • Oracular Multimedia  
San Francisco, CA

**Albums for alternative groups Twenty-Two Brides and The Cucumbers, demo for Freedomland.**

John Williams • Ground Zero Studios • New York, NY

**"Praise Songs" contemporary Christian album/CD, "Body Builders" children's album/CD.**  
Peter Episcopo • Bridge Song Media • Old Bridge NJ

**Sound design for Pepsi Cola TV spot aired during last January mondo-bowl.**

Hans ten Broeke² • Buzz, Inc.  
New York, NY

**Sound reinforcement for theater presentations and concerts in a 300-seat theater.**

Centre Culturel Franco - Manitobain • Winnipeg, MB, Canada

<sup>2</sup> Quote: "It's the only analog component in my room. You hardly know it's there, it's so transparent."

Records, Chief Mastering Engineer at JVC.  
Quote: "It's a great board, dude. Buy it!"



# CONSOLES WORK.

In studios...in clubs...in video and film production facilities...  
on the road: A sample of what satisfied 32•8, 24•8 and 16•8  
owners are doing with their consoles (as of late April, 1994).



Frank Serafine, feature movie  
sound designer/SFX wizard in  
the Foley Room at his Venice,  
CA production complex.

Scoring for two Fox Television  
NFL promos, theme  
& scoring for PBS children's  
series *Storytime*, song  
demos & album tracking,  
TV commercials,  
infomercials & demos.  
John E. Nordstrom II  
Love Den Productions  
Pacific Palisades, CA

Album/CD tracking  
and mixing for the groups  
*Mean Solar Day* and *Product*.  
Ramsey Gouda • Onion Head  
Studio of Chicago • Chicago, IL

Worship service and in-house  
concert sound reinforcement,  
recording of sermons.  
New Life Assembly of God  
Lancaster, PA

Sound  
rein-  
force-  
ment  
in a live  
blues  
club  
showcas-  
ing live,  
regional &  
national  
acts such  
as *Savoy  
Brown*,  
Jr. Wells,  
etc.

Manny's Car  
Wash  
New York, NY

Rental for film  
mixing projects and  
home studios.

"We love them  
because we never see  
them. They're great for our  
business."

Chris Dunn • Dreamhire  
New York, NY



DNA sampling CD with  
mega-drummer *Bernard  
Purdie* (3000+ album credits)!  
Frank Heller<sup>3</sup> • Weasel Boy  
Recording • Brooklyn, NY

The  
Sidecar  
\$395<sup>4</sup>

MB•E Meter  
Bridge  
\$695<sup>4</sup>

Skittles  
TV commer-  
cial, demo for  
new artist *Nita  
Whitaker*, original  
music for *Terpsicorps*  
modern dance company.

Lincoln Adler  
Are We Famous Yet? Productions  
Los Angeles, CA

## OTHER PROFESSIONALS WHO OWN AND USE MACKIE DESIGNS 8•BUS CONSOLES\*

Dave Abbruzzese,  
drummer for Pearl Jam

Slash,  
guitarist/songwriter,  
Guns 'N Roses

Steve Brown,  
guitarist/producer for Trixter

Natalie Cole,  
solo artist

Greg Droman,  
Grammy-nominated engineer  
for Linsey Buckingham

Gregg Field,  
drummer for Frank Sinatra

Michael Frondelli,  
Engineer-Producer (Eric Johnson,  
Crowded House, etc.), Creative  
Director for Capitol Records

Bill Gould,  
bassist for Faith No More

Bashiri Johnson,  
percussionist for  
Whitney Houston, Madonna

Mick Jones,  
producer for Van Halen,  
guitarist for Foreigner

Art Neville,  
producer, The Meters,  
keyboardist, Neville Bros.

David Frangioni,  
MIDI specialist/Engineer  
Aerosmith, Elton John, and Extreme

Danny Kortchmar,  
producer for James Taylor,  
Billy Joel, Rod Stewart

Bruce Kulick,  
guitarist for Kiss

Kyle Lenning,  
President Asylum Records,  
Nashville

Clair Marlo,  
Artist, Producer

Queensryche

Dave "Snake" Sabo,  
guitarist for Skid Row

Ben Sidran,  
producer

Leo Sidran,  
songwriter for Steve Miller

Steven Tyler,  
singer for Aerosmith

\*Mention in this list is intended to  
indicate ownership only and does  
not in any way denote official  
endorsement.



Producer Ricky Peterson's Pre/Post  
Production Room with Mackie Designs 24•8  
at Paisley Park.

R&B radio remix of *Boyz  
Scaggs*' "I'll Be The One" for  
Virgin Records, recording solo  
album for the Japanese  
Go Jazz label.

Ricky Peterson, producer,  
Paisley Park  
Minneapolis, MN

<sup>4</sup> Suggested retail price. Slightly  
higher in Canada.

<sup>3</sup> Quote: "This job had extremely unusual  
and demanding monitoring & effects  
requirements. I honestly couldn't have  
done it without the 32•8."

CIRCLE 46 ON FREE INFO CARD

# MACKIE.

20205 144<sup>TH</sup> Ave NE • Woodinville • WA • 98072 • 800/898-3211 • FAX 206/487-4337  
Outside the US, call 206/487-4333 • Represented in Canada by S.F. Marketing • 800/363-8855  
World Radio History



# Sampling CD Overview

Save time, money, and effort with these sounds for sale

BY CRAIG ANDERTON

Thanks to samplers, the world is your waveform. But how many people take the time to record, edit, perfect, and loop their own samples and riffs? Apparently not that many, based on the ever-increasing number of sampling CDs being offered to a sound-hungry world.

Sure, sound effects libraries have been around for years — the CD's introduction simply nuked clicks, pops, tape wear, and inconvenient

sound retrieval. What's really new is the proliferation of sampling CDs geared toward musicians, DJs, and multimedia producers.

The trend started with the McGill University and Prosonus libraries, which had difficult-to-sample sounds on CD (string sections, brass, exotic percussion, etc.). Once the world became saturated with samples of conventional instruments, sample CD developers turned their ears elsewhere.

Optical Media introduced the first CD-ROMs for a specific sampler — the Universe of Sounds series for the Emulator II. Roland, Ensoniq, and others also developed CD-ROMs for their machines. More recently, OSC's three-volume *Poke in the Ear With a Sharp Stick* series of AIFF files for the Mac promised "no French horns," and remains the most unconventional CD-ROM sample library.

Audio-only CDs are flourishing too. East-West Communications,

which has grown to become one of the main forces in sampling CDs, scored a major coup by obtaining Bob Clearmountain's drum sounds, and in the process started the trend toward "celebrity" sample CDs. Q Up Arts sampled several top drummers for its *Heavy Hitters* CD, Sampleheads corralled Will Lee into doing the ultimate bass CD, AMG released a CD from Erasure's Vince Clarke, and East-West has just finished a Steve Stevens guitar CD.

Meanwhile, thanks to the popularity of dance music, CDs with drum loops, sound effects, robot voices, and raw materials for dance music collages are very popular. East-West took the process further by including a MIDI file disk along with some of its CDs to facilitate sequencing the sampled sounds and loops. MIDI files also let you transpose, change the mix, or change the tempo by driving MIDI sound generators instead of just using the audio loops. For drum loops, WC





Research even started offering MIDI "groove templates" on disk so you could quantize other sequence parts to the same "groove" as the sampled drum loops.

The latest buzz is the "mixed media" sampling CD, which contains audio data side by side with sample files ready to load into your sampler or computer of choice. Also, note that some CDs exist in both audio and CD-ROM form. While audio CDs are usually less expensive, they're just the raw sounds; CD-ROMs offer samples that have been looped, mapped to keyboard ranges, and turned into useful performance presets. It takes time and effort to develop these, hence the higher price.

Incidentally, remember that CD-ROMs aren't very fast — better than floppies, but not as good as a hard drive or cartridge. This is the tradeoff for having huge amounts of data on a cute silver platter we can all (mostly) afford.

#### WHAT ABOUT THE HARDWARE?

For most computers and samplers, CD-ROM is an option. You'll need a SCSI-compatible CD-ROM and SCSI interface card (if required). Getting into SCSI is not trivial; for more information, see "Terminate Your SCSI Problems" in the February 1993 *EQ*.

For sampler-based CD-ROM applications, contact the manufacturer for drive compatibility recommendations. Sony and Toshiba mechanisms are regarded highly, but some manufacturers advise against low-cost NEC drives (apparently some of the newer double-speed NEC drives are okay). If possible, try before you buy, or make sure you can return the CD-ROM if it doesn't work properly. *Shopper alert: Apple's double-speed CD300 works with virtually all samplers and is being blown out very inexpensively. The audio circuitry isn't the best in the world, but that doesn't matter if you're into SCSI transfers.*

At the sampler end of things, the Akai S1100 format is the most common, and its sample files (as well as keyboard mappings) can be read by the Kurzweil 2000, EIIIIX, and Roland SP-700 and S-760 samplers. Matters

are not quite as simple for CD-ROMs developed for the Akai S3000; operating systems of other samplers can be upgraded to accommodate the S3000 format, but check with the manufacturers to find out the current status.

#### THE FINE PRINT

Because most CDs contain copyrighted sounds, there's usually some sort of licensing agreement. The least restrictive is something like the Will Lee Bass Library CD, which licenses the sounds to the disc's purchaser for use in music production. David Torn's disc has a similar agreement, but if the looped compositions are used "as is" in a commercial production, it's necessary to obtain permission.

Sony Music's Complete Sound Effects Library (a 10-volume set, and currently one of the least expensive CD sound effects libraries) reserves all rights, then gives a phone number to call for commercial rates and information. Use this on your hit record without an agreement, and you could be in trouble.

Note that virtually all sampling CDs prohibit sounds being re-used in other formats. For example, if you sell or give away a disc for a particular sampler using sounds from sampling CDs, you're breaking the agreement.

The general rule: if you use these sounds for personal, noncommercial applications, you're always okay. But if you use them for commercial purposes, read the fine print.

As CD-ROMs move into the mainstream, technological advances will likely bring us samples cut on multisession recordable CDs, so you can save variations of patches for your specific sampler (and sequences using loops) to unused portions of the CD. Another possibility: shorter bandwidth lasers that double or quadruple CD-ROM capacities.

Artistically, expect to see more in-depth treatments of very specific sounds or styles instead of compilations or more "name" CDs from well-known individuals. Also expect the downward trend in prices to continue, but remember it takes work to create a great sample CD — really good sounds will always command a premium.

Eventually, sampling CDs may

**PRICE+QUALITY+  
SELECTION=**

**FULL COMPASS**

**SHURE**  
beyerdynamic)))  
**SONY**  
**EY**  
**AKG**  
**FOSTEX**  
**OTARI**  
Nakamichi  
**dbx**  
**lexicon**  
**MACKIE**  
**RANE**  
KRK  
**Studiomaster**  
**Drawmer**  
**Symetrix**  
**RAMSA**  
**SOUNDTRACS**  
audio-technica  
**APHEX**  
SYSTEM  
**marantz**  
**MX**  
**DENON**  
**ART**  
**FEAR**  
**3M**  
**lowell**  
**CLONE**  
**CLONE**  
**BASF**  
**apollo**  
**CARVER**  
**AI**  
Ampex **ETA**  
Vega Ness  
Zoom Altman  
**AKAI**  
**NEUTRIK**  
**AB**  
**crown**  
**TASCAM**  
**SENNHEISER**  
**Panasonic**  
**GE**  
**Technics**

**AUDIO • VIDEO • LIGHTS  
OVER 350 PRODUCT LINES!  
1-800-356-5844**

**FULL COMPASS**

5618 Odana Road, Madison, WI

CIRCLE 36 ON FREE INFO CARD

EQ OCTOBER 37



**Factory Direct...  
Best Value!**

**EUROPADISK LTD.**

*All Manufacturing  
In Our Plant!*

• **Compact Discs**

*New, Low-Cost Packages!*

• **Cassettes**

*Finest European Equipment*

• **DMM® Vinyl**

*Mastering & Pressing  
Cleanest, Hottest 12" Vinyl!*

• **Graphics**

*Printing with  
Free Custom Layout!*

• **Mastering  
Studios**

*Neve Digital EQ, Sony Digital  
Editing. Major Label Mastering.*

**SPECIALS** - "With This Ad Only"

**500 - Promo CD's - \$995**

**Delivery in 15 Business Days!**

**Promotional Package Includes:**  
CD-R Reference, One Color CD Label  
with Layout, Typesetting & Film  
(to 25 Min.)

**500 - Color CD's - \$1,995**

(1,000 CD's - \$2,265)

**Retail-Ready: FULL COLOR** Front & Tray  
Card, free CD-R Reference, 2-Color CD  
Label, Graphics Layout & Film, Jewel  
Case & Shrink-Wrap (to 58 Min.)

**500 - Cassettes - \$715**

(1,000 Cassettes - \$1,025)

**Retail-Ready: FULL COLOR** J-Card,  
Test Cassette, Graphics Layout,  
Typesetting & Film, Cassette Label,  
Norelco Box & Shrink-Wrap (to 58 Min.)

**500 - 12" Vinyl - \$1,075**

(1,000 12" Singles - \$1,450)

**Retail Ready: 12" Single Package**  
Direct Metal Mastering, 5 Test  
Pressings, Label Layout & Printing,  
Plastic Sleeve, Black or White Die-Cut  
Jacket Shrink-Wrap (to 14 Min. per side)

Call For Our **Complete Catalog**

**EUROPADISK LTD.**

75 Varick Street, New York, NY 10013  
☎ (212) 226-4401 FAX (212) 966-0456

**CIRCLE 29 ON FREE INFO CARD**



**DRUM BOOGIE:** Steve Reid Percussion provides exotic drum sounds from many countries.

become obsolete owing to fiber-optic communication links that would theoretically allow you to download samples from a network for a fee, as well as give you a chance to preview sounds easily (see sidebar "Music Cruising on the Infobahn"). For now, though, audio CDs and CD-ROMs still represent the fastest way to get lots of great sounds into a digital audio system.

**SAMPLING CD THUMBNAIL REVIEWS**

*The following reviews are by Craig Anderton (CA) and Tona Walter Ohama (TO)*

**Combo Vol. 1 (Q Up Arts).** Mixed media CD supports the same samplers as David Torn's CD, with about 38 minutes of audio (the rest of the 70-minute CD is data). There are six short demo tunes, and 12 groups of samples including drums, conga loops, horns, ethnic, cymbals, guitar textures, and the like. It's an excellent introduction to the Q Up line, but also has lots of useful samples. \$100. —CA

**Dance Series No. 1 by Mégamidi (Mégamidi Sound Land: U.S. distributor: Q Up Arts).** 56 minutes of European sounds for audio collage fans. Of

**MUSIC CRUISING ON THE INFOBAHN**

FirstCom Online is readying a service for downloading CD-quality "needle-drop" production music via telecommunications. MusiQuick software, available for the Mac and Windows, lets you enter key words for the type of music you seek from a database that currently stocks over 8000 titles on 355 CDs. The basic MusiQuick software is \$295; a companion CD-ROM (add \$200 to the basic price) lets you audition sounds off-line, then access what you need from the network.

FirstCom Online claims it will offer the features that make online distribution so attractive in other fields: instant access, 24-hour operation, a certain degree of intelligence (i.e., it can find selections based on criteria you specify) — and no need to mess with overnight delivery services. For more information, contact FirstCom at 13747 Montfort Dr., Suite 220, Dallas, TX 75240. Tel: 800-858-8880 or 214-934-2222. Circle EQ free lit. #185.

—CA



## REMIX 2!!

The sequel to the highly successful best-seller 'Remix 1' from UK's Megabass (Martin Smith & Darren Ash) - this one features more incredible rave loops, scratch toolkits, Vox, choral, sung + chanted, FX, Ambient, Acid, Synth, Bass, Drums + more. Remix 1 is our best selling CD for fast loops - THIS IS BETTER!

**ONLY \$99.95**



## STEVE STEVENS

The ultimate guitar sample collection on CD/CD-ROM from Billy Idol guitarist Steve Stevens - incls. Power chords, Chugs, Lead, Fuzz, Flesh chords, Univibe, Wah, Tremolo, Pitch shifted harmonics, Electric sitar, Ramirez Flamenco, Dive bombs, 5ths, Harmonic drags, Doubles, Triads, Open Chords, Special FX etc.

**ONLY \$99.95**



## NEW CATALOG - FREE !!

THE WORLD'S FINEST SELECTION OF SAMPLED SOUNDS ON CD & CD-ROM



EAST-WEST/SOUNDWAREHOUSE

**72 COLOR PAGES - 100's of PRODUCTS!**



## FUNK BASS

From the creator of Zero-G's Funk Guitar comes an even more amazing collection - this time a 2-CD set. CD-1 features a huge number of loops, divided into many sections. Where appropriate, loops are provided in up to 5 different keys AND each section is supported by multi-samples on CD 2 - funky bass loops.

**2-CD SET \$99.95**



## BLACK II BLACK

From McIntosh and Charles - Black II Black is the biggest and best collection of kickin' R+B samples around! It features Kickin', Mid-Slo Jamz, Garage/House loops, Reggae loops, Stereo vocal blocks, Sax + Trumpet licks, Guitar licks, Bass lines, FX, Percussion loops, Rare snares, Ragga, Swing, Disco and more!!

**ONLY \$99.95**

## SUPER BRASS

Brass Super Section consists of multi-sampled brass which allows you to combine various horn sections and play them on a keyboard in unison. The timing of the playing is perfect and everything is pitched in an identical manner - if you need brass - nothing compares to this!! (CD-ROM only \$199.95)

**ONLY \$99.95**



## MO' FUNKY ELEMENTS

EVEN BETTER than its predecessor It fills in all the gaps left by 'The FUNKY ELEMENT' so between the two you've got all areas covered! A FUNK workstation - It's rough, but it's definitely ready - Sound quality tends towards the antique, giving a pretty consistent warm character. Just add vocals - Seriously!!

**ONLY \$99.95**



## X-STATIC GOLDMINE 2

A journey from the JB's to Snoop, in a steady stream of Dope HipHop loops, Ragga Beats, Swingbeat Grooves & ol' Skool Funk Samples - As good as the legendary X-Static Goldmine +500 Phat Grooves & Beats, 1000 Rap/Jazz/Funk samples - Over 1500 Kickin' Samples (CD-ROM has 3000 + MIDI Files + Audio CD)

**ONLY \$99.95**



# EAST★WEST

SOUNDWAREHOUSE

## OVER 300 SAMPLE CDS & CD-ROMS

# CALL 1-800-833-8339

CIRCLE 24 ON FREE INFO CARD

## SLY DUNBAR

The world's #1 Reggae drummer and Producer. One half of Sly and Robbie. There's nothing like this on the market! The styles & sounds are simply overwhelming - +700 loops +500 MIDI Files on floppy disk (Atari or MAC) +200 impossible to find authentic Dancehall + Bhangra beats + Reggae + Ska + DNA files

**ONLY \$99.95**



## DANCE/INDUSTRIAL 2

Our biggest selling CD in 1994!! D+I 2 is a 2-CD set featuring loops, + component samples from each loop, plus the sequence data of each loop on MIDI-file disk. Use the loops as is - or customize the loops with the MIDI Files!!

★★★★★ Five-star Review

**2-CDs+MIDI-FILES ONLY \$99.95!!**



## ORCHESTRA

Peter Skoldaczek's Orchestra features samples of a full orchestra in a large concert hall. The orchestra and string sections were recorded playing various notes, chords, and short progressions. "The quality of the recordings, both alone and when loaded on a sampler, is perfect" KEYS CD-ROM now only \$199.95

★★★★★ Five-star Review



## GIGAPACK 1&2

2 CD-ROM PACKS for ROLAND samplers - Monstrous! Over a gig of mind-blowing sounds in each 2-CD-ROM collection. Every sound imaginable is included in both packs - Vol.1 even includes the entire "Classical Choir" library! and Vol.2 includes all of "Hallelujah"! all at an incredible price!

**\$399.95 A PACK**



## BC DRUMS 2

"Bob Clearmountain's Drums 2 is as good as it gets! Drums 2 makes copious use of velocity switching and this, along with impeccable sampling quality, puts it into a class by itself" - EQ REVIEW - "Drums 2 is top of the heap!" KEYBOARD REVIEW - and now you can get the CD-ROM version for only \$199.95!!

**ONLY \$99.95**

## LIVING DRUMS

What do Steely Dan, Weather Report, Chick Corea, Jaco Pastorius, Bob James and Michael Brecker have in common? - Peter Erskine-REAL drum performances, loops and multi-sampled drum kits, all immaculately recorded. Jazz, Pop, Rhythm + Blues, Latin - it's all here! (CD-ROM version \$299.95)

**ONLY \$99.95**



## TECHNOPHOBIA!

Hard-edged techno + industrial loops + perc. Ultra-high standard of production - "It's hard, it's brash, it's funky, it's catchy, it's well produced, it's comprehensive, it's... it's... Well, quite frankly it's brilliant!" (Future Music)

★★★★★ Five-star Review

**ONLY \$99.95**



## ORDER INFORMATION

For fastest delivery use your credit card



# EAST★WEST

SOUNDWAREHOUSE

345 N. Maple Drive, Suite 277, Beverly Hills, CA 90210, USA

In the USA call toll free 1-800-833-8339 (orders only); from other countries call 310-858-8797; or fax us at 310-858-8795. For INFORMATION call 310-858-8797. If ordering by credit card include your card number and expiration date. All mail orders must be pre-paid by credit card or by money order in USA dollars drawn on a USA bank. Shipping/handling USA (Post) \$4.75 or (NEXT DAY AIR) \$9.75; Alaska, Hawaii, Canada (Post) \$10; other countries \$20; CA residents only - add 8.25% sales tax.



# NEW OR USED!

OVER 7000 PIECES OF USED GEAR!  
FREE Freight! FREE Catalog! FREE T-Shirt!



30 DAY WARRANTY.  
MONEY-BACK GUARANTEE... GIVE MY BOY MITCH A CALL!  
**Circle Guitar**  
At: Mitch @ 1427C Ventura Blvd.  
Sherman Oaks, Ca. 91423  
Fax Mitch (818) 789-0341  
Info: (818) 789-0665  
**(800) 294-2202**  
LOW, UNBEATABLE, VERY SMALL, OUTRAGEOUSLY TINY PRICES!

CIRCLE 39 ON FREE INFO CARD

## PROFESSIONAL QUALITY AT THE RIGHT PRICE



**Heavy Duty ATA**  
• Custom and stock sizes  
• Quick turn around

Medium to Heavy Duty Keyboard Cases  
• Prices starting at \$126



**Heavy Duty AMP and Effect Racks**  
• Prices starting at \$129



Hardshell Cases  
Available for:  
guitars racks  
keyboards

## DISCOUNT DISTRIBUTORS

FOR INFORMATION CALL 800-346-4638  
AND FREE BROCHURE (In N.Y.) 516-563-8326

**The Case Specialists**

CIRCLE 22 ON FREE INFO CARD

## TECHNIQUES SAMPLING

particular interest: 17 "song kits" with drum loops, bass parts, vocal sounds, and other instruments for techno, rap, house, and funk. Sample all the bits into your keyboard for an instant dance tune. The rest of the disc has drum loops and lots of individual samples (various drums, percussion, basses, orchestra hits, vocal samples, guitars, etc.). Although some sounds already seem dated (the disc was released in 1991), this is still hot stuff — the analog drum and bass sounds alone justify the price. \$99. —CA

Dance Series No. 2 by Mégamidi

has 61 minutes that emphasize the "song kit" approach of Dance Series No. 1. The disc contains 40 tracks, from industrial to African dance style, with looped figures and individual samples. It's sort of like paint-by-the-numbers for music, but it's lots of fun and there are enough common tempos for you to be able to combine grooves from wildly different styles, often to good effect. \$99. —CA

Dr. Garfield's Digital Audio Drums (Big Fish Audio) does an admirable job covering the now-standard application of drum samples.

## WELL-ORCHESTRATED ORCHESTRA

**Peter Siedlaczek's Orchestra for SampleCell (East-West).** The Orchestra CD-ROM (reviewed here for SampleCell, but also available for the Akai 1000) features samples of a full orchestra in a large concert hall. The orchestra and string sections were recorded playing various notes, chords, and short progressions.

I've never played so much music by hitting a single key on my sampler. The samples are huge. It takes a 32 MB SCSI card to play a full keyboard of velocity-switched sustained strings or orchestra. Each of the AIFF samples is supplied in three versions (44.1k stereo, and stereo and mono at varying rates) and was recorded at intervals of 3 semitones (C Eb F# A in each octave). The three versions accommodate as many bank/SampleCell memory combinations as possible. You can use this disc with 8 MB or less, but a 32 MB SCSI is the ideal system. This disc pushes the current technology to the edge.

The Orchestra Sustained samples cover six octaves with pp and ff versions of each. The other orchestra categories (Major, Minor and Diminished Hits, Major and Minor Glissando, Tremolos, Staccato, and Sustained Pentatonic) cover 1 octave and were recorded pp and ff.

The Strings Sustained are similarly sampled at every third, covering 6 octaves. The other string samples are Tremolo (1 octave), Pizzicato (4 octaves, mf and pp), Spiccato (4 octaves, ff), and Major and Minor Arpeggio (1 octave). The Diminished Arpeggio has only one sample and is also stored unexpectedly in the Major Arpeggiato folder.

Lastly, there are Harp Hits (Major, Minor and Diminished, 1 octave) and my favorite, Clusters (6 samples).

I had to learn a new keyboard technique to play these sounds effectively. The one aspect that makes this disc so appealing (creating realistic orchestra effects by recording a real orchestra) is also sometimes frustrating; many of the samples are meant to be triggered rather than played. The sounds are very responsive to a subtle touch, many using velocity crossfading. After an adjustment period, I found I really liked playing with *Orchestra*. It does sound incredible.

One thing to keep in mind, and this is no fault of the software: arpeggios and glissandos will change their speed as you change pitch. The amount is modest because the sampling occurs at three semitone intervals, but it is there.

If your work could benefit from a full orchestra (commercials, industrial video or low budget film/TV scores), this disc could potentially save or make you a lot of money in a single session. It could also help a low-budget soundtrack sound a lot more expensive. The clusters are straight out of a horror film. The glissandos sound very dramatic. With the appropriate projects, this disc will prove invaluable to 32 MB SCSI-card owners. \$199.95 CD-ROM —TO





**TONAL TEXTURES:** Give yourself a hand.

Overall, these 1100+ stereo samples are excellent, and the disc covers the percussive range for use in many styles of music such as country, rock, dance, or pop.

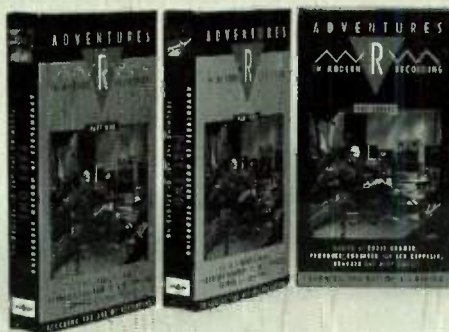
These are fairly standard percussion samples (no tablas here) and fairly tame samples (sorry to anyone doing hard industrial work). This disc doesn't try to cover the entire percussive world but focuses closely on the basic drum kit plus Latin-American percussion. For example, there are nearly 90 tambourine samples alone, with a wide variation of upstrokes, whacks, and shakes. Percussion programmers are going to love this!

The sampling quality is excellent. Drums are recorded dry with various touches and also in different rooms. Noise levels are quite low, and fade out nicely. Every cymbal and drum decays naturally. The drums are tuned properly and there are no extraneous sounds. Unfortunately, a few samples contain too much noise (cymbal scrapes, a few techno kicks, and a couple of poor percussion samples) that mar what is otherwise an exceptional piece of work. Nonetheless, this disc is definitely worth checking out.

I have one complaint, which applies to most sample disks. Although each sample is stereo, nearly all are sampled with the instrument dead center while the room ambience or effect surrounds it. This sounds great when playing a solo sample, but when you create a virtual drum kit out of these stereo samples, all the instruments are in the center of the stereo field. In order to pan instruments, you effectively destroy or at least alter the natural stereo image of the sample.

The drums are available formatted for various samplers (e.g., SampleCell, E-mu EIII, NED Synclavier, Akai S-1000, and Roland S-770) for \$399.95, and although this reviewer only sampled the audio disc, the setup of kits

## ADVENTURES IN MODERN RECORDING



"I COULD HAVE LEARNED MORE ABOUT RECORDING FROM WATCHING THIS VIDEO SERIES THAN I DID IN THE FIRST FIVE OR MORE YEARS OF MY PROFESSIONAL CAREER."  
JIMMY WALDO (ALCATRAZZ/QUIET RIO!)

### Learn the Art of Recording from the creators of dozens of gold and platinum records.

Engineers for Led Zeppelin, Mariah Carey, Jimi Hendrix, Rolling Stones, Michael Bolton, the Beatles, among many others, shows you how to make studio quality recordings at home, covering everything from portastudios to the latest 24 track digital home recorders.

Part One: Essential elements of recording! 2 hrs. **\$49.95\***

Part Two: Follow a band through the complete Recording Process! 90 mins. **\$49.95\***

Order now and receive the entire 3.5 hr. series for only **\$69.95\***

The series, starring Eddie Kramer, includes a visit with Les Paul himself!!!

**CALL 1-800-995-9664 TODAY!**

\*Plus shipping and handling.

# FOR THE FIRST TIME ON VIDEO!

SEND CHECK OR MONEY ORDER TO:

**PREMIUM ENTERTAINMENT**  
1025 SANSOME STREET  
SAN FRANCISCO, CA 94111

.....OR.....

CONTACT YOUR  
LOCAL MUSIC STORE.

CIRCLE 54 ON FREE INFO CARD

## WEST L.A. MUSIC GUARANTEED LOWEST PRICES!

EVERY MAJOR BRAND

DIGITAL MULTI-TRACK RECORDING • ANALOG RECORDING  
HARD DISC RECORDING • MIXING CONSOLES  
POWER AMPS • MICROPHONES • SPEAKERS • COMPUTERS  
SOFTWARE • KEYBOARDS • GUITARS • AMPS • DRUMS

**"WHERE THE PROS SHOP"**



PHIL RAMONE - PRODUCER  
WITH GEORGE ADRIFF - PRO AUDIO DEPT.



RANDY NEWMAN - COMPOSER  
AT WEST L.A. MUSIC



ELMER BERNSTEIN - COMPOSER  
WITH JOHN COX - KEYBOARD DEPT.

### WE WILL BEAT ANY DEAL! CALL NOW!

All Credit Cards Accepted. Financing and Leasing Available. We Ship Everywhere.

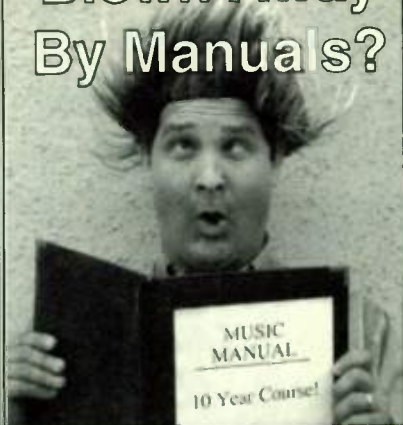


**WEST L.A. MUSIC**  
11345 Santa Monica Blvd.  
Los Angeles, California 90025  
(310) 477-1945 Fax: (310) 477-2476

CIRCLE 66 ON FREE INFO CARD



## Blown Away By Manuals?



### VIDEO

#### Training Programs for:

**Finale** (also Great for Allegro!)  
**Cakewalk** (also great for Home Studio!)  
**Cakewalk Application Language (CAL)**  
**CAL Tutor - Performer**  
**Pro 4 / Pro 5 - Band In A Box - Encore**  
**Midi Basics - Cubase - Vision**  
**Sequencing Midi Drums**

# EVS

Effective  
Video  
Solutions

(210) 614-0574 • FAX (210) 614-0577

1-800-650-2427

VISA and MasterCard Accepted

CIRCLE 32 ON FREE INFO CARD

## Add a MIDI Solution to your MIDI Setup!



Relay  
**\$99** MSL

- Place any footswitch input under MIDI control!
- Programmable to respond to most types of MIDI messages
- MIDI-powered - no batteries or wall adapter required to operate!

Footswitch  
Controller  
**\$79** MSL



- Generate virtually any type of MIDI message!
- Transpose or rechannelize in real time
- Accepts normally-open or normally-closed type footswitches

Call for a **FREE** brochure describing our complete line of modular MIDI-processing products!

Toll-Free 1-800-561-MIDI (6434). Outside US and Canada call (604) 794-3013 Fax (604) 794-3396 or write to MIDI Solutions Inc., 816-810 W. Broadway, Vancouver, BC Canada V5Z 4C9

## MIDI Solutions Inc.

Innovative Solutions for Today's Musicians

CIRCLE 47 ON FREE INFO CARD

## Big Fish Audio

# ROSS GARFIELD

## BEST DRUMS ON EARTH

## THE DRUM DOCTOR DOES DRUMS

# CD-ROM

THE DOCTOR IS IN: Big Fish's Ross Garfield Drums.

for your sampler should be worth the money. If you don't have one of the samplers listed, the Sampling Audio CD plays on a regular audio CD player. \$99.95 audio CD. —TO

**Master Drums by Charlie Morgan** (Bridge Recording Company: U.S. distributor: Q Up Arts). Sixty-four minutes of acoustic drum loops and samples that are oriented toward more traditional music (soul, funk, rock, blues, jazz, reggae, country, etc.). Each cut has four measures of groove and two types of variations (start/stop and

fills), typically at two or three different tempos per style. If you've been lifting loops from vinyl, this is a lot cleaner sounding and avoids copyright problems. \$99; \$199 for CD-ROM. —CA

**Percussion Incognito by Armando Borg** (WC Music Research). Similar package to Bernard Purdie's, with 700 loops, 175 samples, 700 MIDI files on disk, and 10,000 "groove templates." If you want drum loops there are a zillion CD options out there, but there's not a lot of percussion on most of them. This set remedies the problem;

## YOU CAN GET THERE FROM HERE

Want to get audio directly into your computer the easy way? OMI's Disc-to-Disk 1.1 reads a variety of CD sound files — standard audio, Sound Designer II, AIFF/AIFC, Apple SND, Windows .WAV, and QuickTime — and blasts them onto your hard drive via SCSI. You can select a particular track (as shown on a "disc map" graphic) or range of tracks, preview them before transferring, choose from 11, 22, or 44.1 kHz sample rates (8 or 16 bit), and save a file or list of files on your drive in any of the supported digital audio formats. Other goodies include optional data compression and the ability to sample stereo or individual channels, change amplitude, trim silence, and so on.

Disc-to-Disk supports the Apple CD300 family, NEC 3x family, Sony CDU-561/7811, and Toshiba 3401/4101 CD-ROMs, but check before you buy — many older drives won't work with the program. Still, Disc-to-Disk is extremely useful and at \$199, is irresistible if you work with CD-ROMs and audio. OMI, 180 Knowles Dr., Los Gatos, CA 95030. Tel: 408-376-3511. (Also distributed by Q Up Arts.) Circle EQ free lit. #118.

—CA



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

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



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

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

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

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

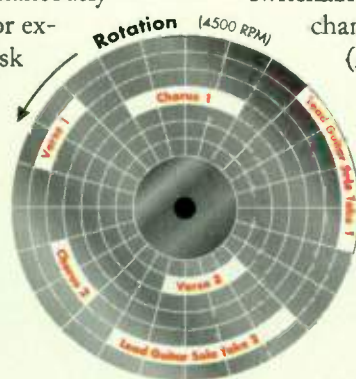
With standard tape machine-style controls the DR4d is by far the easiest hard disk recorder to operate, which means that you can get to work immediately creating music rather than setting up and operating a computer system. Punch ins/outs can be performed manually or automatically from the front panel,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

Now you can start to take advantage of random access editing. You can cut, copy, and paste sections of audio with ease. Our Jog/Shuttle wheel lets you scrub through the audio at various speeds, forwards or backwards. Try out different arrangements. Create perfect tracks by combining the best sections from multiple takes. And you can edit with confidence, because if you change your mind you can instantly Undo your last edit - even

after the power is turned off and on again! Imagine it. Do it. It's that simple.

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

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



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

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

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

Akai dealer today for a complete demo!

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

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

**DR4d** **AKAI**  
**DIGITAL**

P.O. Box 2344  
Ft. Worth, TX 76102  
(817) 336-5114  
Fax 870-1271

CIRCLE 03 ON FREE INFO CARD



the groove templates are particularly useful, and not just for percussion. \$99.95 —CA

**Poke in the Ear With a Sharp Stick, Vol. 3, by various artists (OSC).** Rude noises, loops, squeaky balloons, weird vocal snippets, tape recorder sound effects, bodily noises, cool rhythmic loops, and much more — this disc has over 1700 samples (516 MB). If you like Nine Inch Nails, sci-fi films, hardcore techno, horror flicks, and have a sense of humor, this CD is a gold mine of offbeat samples. You'll need to ignore some of the grunge and noise that goes with "found sound"; then again, in some cases, that's the charm. One glitch: a few samples wouldn't load into Sound Designer, and caused an "AIFF file is missing its form chunk!" warning (check out the last 12 under Generic Phrases in the Vokal folder to see if they'll load with your system). \$149. —CA

**Psychic Horns by Jason Miles (Q Up Arts).** Another mixed-media CD for the same cast of samplers. Excellent, clean horn sections, with multi-sampled stabs, sustains, swells, falls, slides, and doubles, as well as single-key riffs and some drum loops. There are 54 minutes of data and only about 10 minutes of audio, but if you want great R&B/funk horns, this is the ticket. \$129 for audio or CD-ROM. —CA

**Rhythm Central by Bernard Purdie (WC Music Research).** This package consists of an audio CD with over 700 drum loops (including various mixes), generally grouped as 10 or 12 variations on a particular theme, and over 200 drum sound samples. Bernard Purdie is certainly one of the best in the biz, and his grooves would be ideal for a variety of funk and acid jazz tracks. The individual samples are also excellent. But wait, there's more: an additional floppy disk contains Standard MIDI Files for each loop, as well as "groove templates" for Cubase, Performer 5.0, and Vision 2.0 sequencers. It's a lot of data to wade through, but worth the effort. \$99.95. —CA

**Steve Reid's Definitive Percussion Sampler (Eye & I Productions).** Plenty of percussion that I have never heard of before! The Brazilian Pandeiro. The Indian Mirdangam. Angklungs. Djembe. Iya. Where in the world have I been?

Plenty of percussion that I have heard of, too! Spoons. Rain Stick. Kalim-

## BOB CLEARMOUNTAIN DOES DRUMS

**Bob Clearmountain Drums II for SampleCell (East-West)** is as good as it gets. Drums II (also available for the Roland 700 and Akai S-1000/3000) makes copious use of velocity switching and this, along with the impeccable sampling quality, puts it into a class by itself.

East-West recommends 16 MB and drum pads, although I found it very usable with 8 MB and a keyboard. It tested well using a pair of SCIs, so you don't have to trash your old cards, but you should use the SCII editing software.

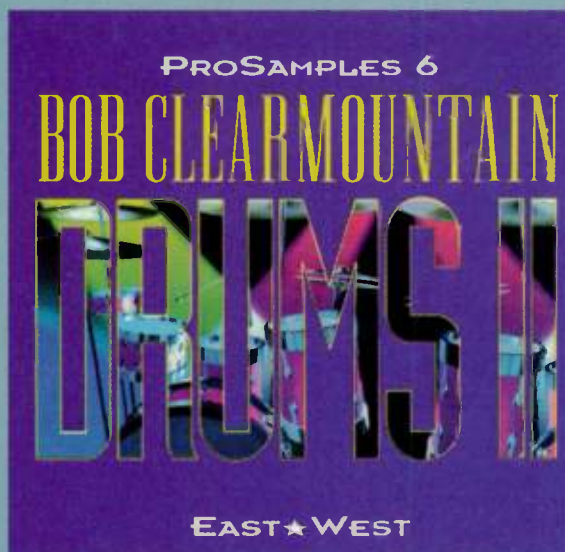
The raw samples (kicks, snares, hi-hats, toms, cymbals, live handclaps, live fingersnaps, a gong, and one basketball) are in Sound Designer II format and sound magnificent. The samples decay naturally (one ride cymbal is over 16 seconds long) and the stereo imaging is like a real miked kit.

Many variations of the drums were recorded. For example, the Remo kick drum was sampled "hard" twice. These "a/b" versions allow you to do rolls without using exactly the same sample twice in a row. The kick was also sampled twice with a "soft" touch. Each of these four samples was recorded with a Neumann U-47, an AKG D-12, and a Sennheiser MD-421 microphone. Each combination of microphone and touch was recorded dry, ambient, and more ambient.

The samples are impressive (especially the basketball), but it's the velocity switching that makes these drums seriously playable. Over 1200 instruments are supplied consisting of a single sound or single dynamic grouping. The levels and sounds change smoothly across the velocity switch points, and these are the most realistic drums I've ever played via MIDI.

The more you plan to use this disc, the more economical the CD-ROM will be compared to the CD version. I can think of four reasons why this CD-ROM will save time and money. First of all, the samples are flawless. Why sample them from an audio CD when all that work's been done, and it's been done right? Even the organization and naming of the samples is excellent. Second, with velocity switching, there can be many samples in a particular kit. Some SampleCell banks are more work than others to set up and these kits are in the "more work" category. It's not outrageous, but enough to tip the scales towards the CD-ROM, which includes over 120 kits for you to use and customize. Third, if you own the CD-ROM, you won't have to worry about backing up (and restoring) your samples. The fourth reason is the convenient access to all the sounds. Banks will automatically load all samples from the CD-ROM. If you want to speed up loading times for a particular session, you can use "Save As" and SampleCell will copy all the samples used in the bank from the CD-ROM to your hard-drive. You can also easily "trade" one sample for another.

The only real reason for getting the audio CD is that you don't own SampleCell. CD-ROMs are also available for the Roland 700 series and the Akai S-1000/3000 series. It's obvious that lots of care went into *Drums II*. \$99.95; CD-ROM \$199.95. —TO







## EVERYTHING YOU EXPECTED. AND MORE.

### THE LEXICON PCM-80: THE NEXT GENERATION OF DIGITAL EFFECTS PROCESSING

At Lexicon, we've been making highly acclaimed digital effects processors for longer than anyone else: devices used in practically every studio in the world. Our systems offer pristine audio quality and unsurpassed control, making them the premier choice for musicians, engineers and producers alike.

Now, we've done it again. The PCM-80 is the next generation of effects processing. Based on our renowned PCM-70, it features the latest versions of several favorite effects from its predecessor. But there the similarity ends.

The PCM-80 is based on a new hardware platform featuring the very latest in proprietary digital signal processing. It's a true-stereo processor with balanced analog I/O as well as digital interfacing – you can even mix the two sets of inputs together. Its 24-bit digital bus ensures the finest resolution within the PCM-80's multiple-DSP architecture.

Onto this powerful platform, we built brand-new algorithms offering a virtually unlimited palette of sounds – some based on your favorite PCM-70 programs, plus many entirely new effects. There's an immense range of chorusing, panning and delay-based programs which can be combined with Lexicon's famous reverberation for startling, other-worldly sounds. There are even dynamic spatialization effects.

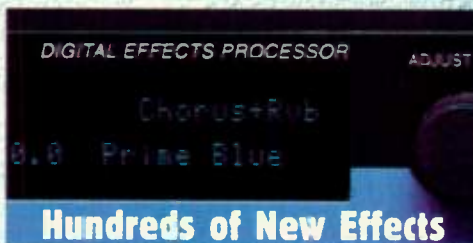
Perhaps the most impressive feature of the new PCM-80 is its unique Dynamic Patching™ matrix, which takes the PCM-80 into new sonic realms. Dynamic Patching provides incredibly powerful, synthesizer-like control over your effects. It maps data from external and internal controllers such as footswitches, envelope generators, MIDI controllers, tempo and LFO's – even the input signal itself – to any effect parameter. With up to 10 patches per effect, and an amazing eight steps per patch, the control possibilities become almost unlimited.

There's also a 'tempo' mode for every program which can drive almost any element of the PCM-80's effects.

Delay lines, LFO's and Lexicon's unique Time Switches can all be quickly aligned to the tempo of your piece, with both rhythmic and absolute time values. You can source the tempo from MIDI, or generate MIDI clock from your own tap.

To round it all off, there's an industry-standard PCMCIA card slot for extra program memory – and for future algorithms – plus SIMM sockets for extending delay memory. The PCM-80 is designed to carry on Lexicon's tradition of creating products with staying power.

There's more to know about the PCM-80, which we can't tell you here. Experience it at your authorized Lexicon dealer. It's everything you expected – and more.



# Lexicon

## HEARD IN ALL THE RIGHT PLACES

A Harman International Company

LEXICON INC., 100 BEAVER STREET, WALTHAM, MA., 02154-8425 TEL: (617) 736-0300 FAX: (617) 891-0340 INTERNET E-MAIL: 71333.434@COMPUSERVE.COM (CIS: MIDI VENDOR B)

**CIRCLE 45 ON FREE INFO CARD**

World Radio History



## CONTACTS FOR REVIEWED CDS

**Big Fish Audio**, 11003 Penrose Street Suite C, Sun Valley, CA 91352. Tel: 800-717-3474. Circle EQ free lit. #119.

**East-West SoundWarehouse**, 345 N. Maple, Suite 277, Beverly Hills, CA 90210. Tel: 800-833-8339 or 310-858-8797. (Distributes CDs by Sampleheads, WC Music Research, Big Fish, OSC, and its own, as well as a host of other. Call for their catalog.) Circle EQ free lit. #120.

**Eye & I Productions**, Jungfrau Court, Milpitas, CA 95035. Tel: 800-726-7664. Circle EQ free lit. #121.

**ILIO Entertainments**, P.O. Box 3772, Chatsworth, CA 91311. Tel: 818-883-ILIO. Circle EQ free lit. #122.

**OSC**, 480 Potrero, San Francisco, CA 94110. Tel: 415-252-0460. Circle EQ free lit. #123.

**Q Up Arts**, P.O. Box 1078, Aptos, CA 95001-1078. Tel: 408-688-9524. Circle EQ free lit. #124.

**Sampleheads**, 276 Riverside Dr. Suite 3B, New York, NY 10025. Tel: 212-749-1613. Circle EQ free lit. #125.

**WC Music Research**, 62 Hamworth Drive, Willowdale, Ontario, Canada M2H 3C2. Tel: 416-496-9905. Circle EQ free lit. #126.

## THE LEGEND CONTINUES....

Two channels of exceptional equalisation, with unique 'personality'.

1961

VACUUM TUBE  
EQUALISER

- Four main equaliser sections, each having six switchable, overlapping frequencies, variable bandwidth from 0.3 Octave to 3 Octaves and  $\pm 18\text{dB}$  of boost and cut.
- Separate active tube stages for each of the four main equaliser sections for increased harmonic clarity.
- Two additional active tube stages for each output.
- Variable high pass and low pass filter sections with 12dB/Oct 'roll-off'
- Input level control from -20dB to +20dB to optimise signal level and drive the tubes 'soft' or 'hot'.



Q.M.I.  
25 SOUTH STREET, HOPKINTON,  
MA 01748, USA.  
TEL: (508) 435 3666 FAX: (508) 435 4243

CANADA	MEXICO
Gerraudio	Audio Dynamics
Tel: (416) 696 2779	Tel: (5) 538 0050
Fax: (416) 467 5819	Fax: (5) 519 6977

Drawmer Tel: +44 924 378669 Fax: +44 924 290460



Drawmer

ba. Castanets. Washboard. Jaw Harp.

Steve Reid's disc contains an esoteric mix of exotic percussion that would nicely complement any sound effects or percussion library — and it doesn't contain a single gated reverb kick! If you don't have an African Goat-Toe Nail Rattle or a Mexican Clay-Headed Udu, where in the world have you been? CD-ROM: \$189.95; audio CD: \$89.95. Available for Akai, Roland, and SampleCell. Will soon be available for Ensoniq ASR-10. —TO

**Synclavier Sampler Library for SampleCell (ILIO Entertainments).** ILIO Entertainments has secured exclusive worldwide rights to the Synclavier Sound Library. In addition to SampleCell, CD-ROMs for the Roland 700 and Akai S1000 through 3000 series are available with future support for the Kurzweil K2000 and Ensoniq ASR10. The sounds were digitally transferred from Synclavier, and new sounds were added to the library whenever ILIO felt it necessary to improve their quality.

The first volume, *Strings*, features many of its samples at 50 kHz (try that on an audio CD!), including cello, viola, violin, harp, and voices. The looping is excellent and both solo and ensemble versions are included.

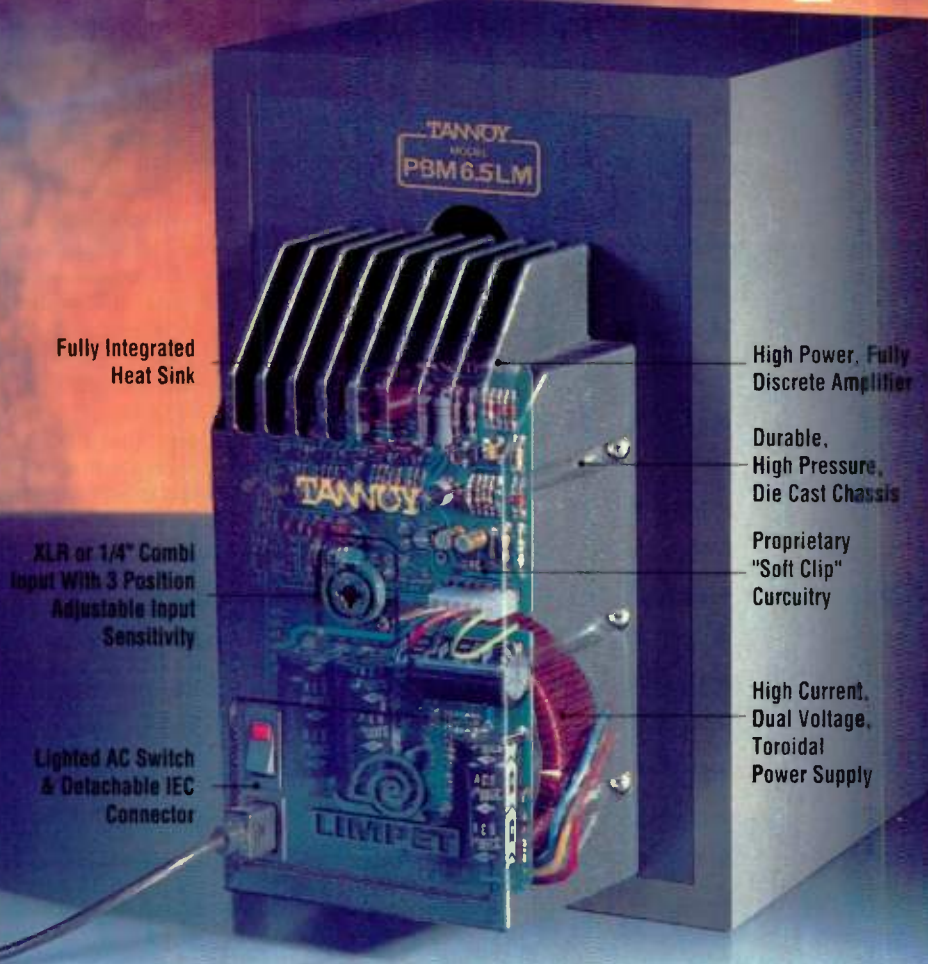
The second volume, *Percussion+*, is a two-CD set. Disc I (Essential) features pop percussion. Disc II (World & Orchestral) has a wide variety of percussion and features 160 MB of the best timpani I've encountered on a sample disc. Compared with similar CD-ROMs, these represent a great value.

ILIO has put a lot of thought into sample organization. They've made it easy to swap percussion sounds, and a nice touch is "blank samples," which are used to limit the key range of sounds.

CIRCLE 23 ON FREE INFO CARD



# They Call Him "Mr." Limpet<sup>®</sup>



Fully Integrated  
Heat Sink

XLR or 1/4" Combi  
Input With 3 Position  
Adjustable Input  
Sensitivity

Lighted AC Switch  
& Detachable IEC  
Connector

High Power, Fully  
Discrete Amplifier

Durable,  
High Pressure,  
Die Cast Chassis

Proprietary  
"Soft Clip"  
Circuitry

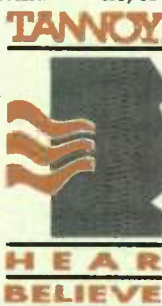
High Current,  
Dual Voltage,  
Toroidal  
Power Supply

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

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

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

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





Projected future volumes are *Keys and Guitars* and *Brass and Winds*. Depending on your needs, many of the sounds are vintage, timeless, or out-dated — take your pick. If you want to experience Synclavier sounds, this is the only game in town. Volume 1, *Strings*, \$399 CD-ROM; Volume 2, *Percussion+*, two-CD-ROM set, \$187/disc. —TO

**Textural Ambience** by Charles Maynes (OSC). The title says it all: over 508 MB of deep, complex, often

synthesized textures that provide a variety of atmospheres (you could probably score an entire educational TV special with just this disc). Many of the samples last 6–10 seconds and evolve leisurely over time; looping these in a sampler with lots of RAM can give some really beautiful, evocative sounds — somewhat like David Torn might produce if he played keyboards instead of guitar. There's also good use made of multisampling. \$149. —CA

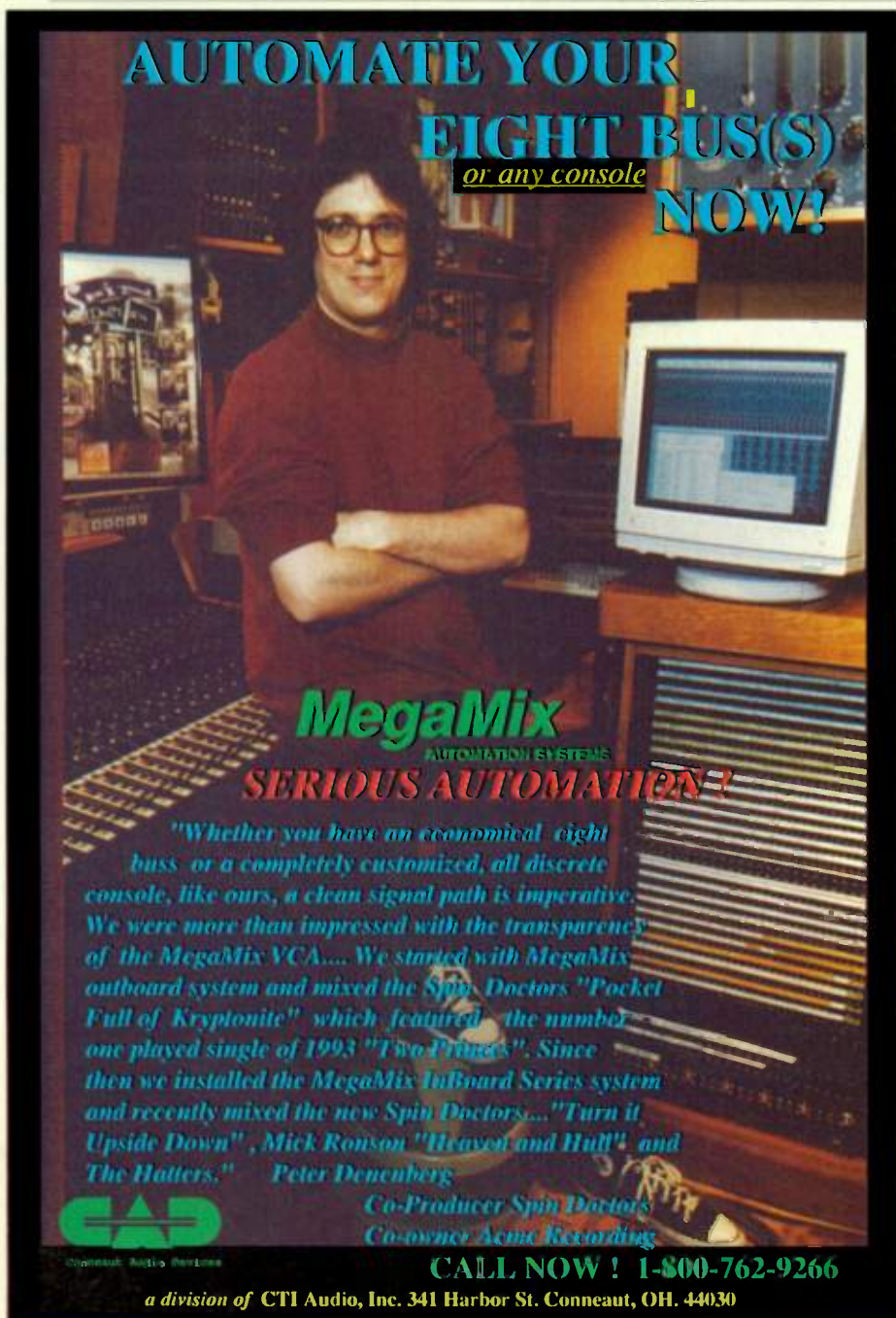
**The Digital Kitchen's Definitive Grooves** (Eye & I Productions). I've tried scratching a few records — enough to know that it's a skill up there with playing the violin and surfing. I don't do it well, but Pimp D definitely does. *Definitive Grooves* contains loads of cool scratches! There are also drum loops (first beat repeated last for easy looping), vocoder effects, female moans, analog waveforms, horn and orch hits — all kinds of neat "audio accessories."

Pristine sampling quality catches all the pops, ticks, and scratches of vinyl, lots of low end, and great feel. Definitely useful if you do rap, hip-hop or dance music. \$79.95. —TO

**Tonal Textures** by David Torn (Q Up Arts). Mixed-media CD contains audio data (32 loops, typically 1 to 2 minutes long; approx. 58 minutes total) and a track with data retrievable by Akai S1000/S1100/S3000, E-mu E111X, Roland SP-700/760, and Kurzweil K2000 samplers. The ROM track is a "greatest hits" collection, with 10- to 30-second loops. Torn creates complex, snaky, haunting ambient loops with electric guitar and digital processing that are perfect background textures for ambient or video-oriented music. This is one sample CD you can also just listen to and enjoy. \$129 audio CD, \$399 CD-ROM. —CA

**Trails & Reflections Reverb Library** (Q Up Arts). Thirty-seven minute audio CD with 84 tracks of Lexicon 300 reverb tails, including various percussion instruments and one track with nine loops. Layer these with sampled drum sounds to save memory (take one great reverb tail, then tune copies to match different drums), or use audio triggers to apply reverb samples to previously recorded drums. The concept sounds weird, but it works. \$79. —CA

**Will Lee Bass Library** by Will Lee (Sampleheads). Seventy-four minutes of rock/pop/funk bass nirvana. Unlike most CDs that record samples so predictable they sound synthesized, this disc contains slides, drops, mutes, riffs, strums, and "x-notes" (idiomatic bass sounds) along with your usual chromatically multisampled bass notes. Place the bass notes on the left side of the keyboard and the riffs on the right, then assemble some amazingly realistic bass parts. \$99.95; \$279.95 CD-ROM. —CA



**AUTOMATE YOUR EIGHT BUS(S) or any console NOW!**

**MegaMix**  
AUTOMATION SYSTEMS  
**SERIOUS AUTOMATION?**

"Whether you have an economical eight buss or a completely customized, all discrete console, like ours, a clean signal path is imperative. We were more than impressed with the transparency of the MegaMix VCA.... We started with MegaMix outboard system and mixed the Spin Doctors "Pocket Full of Kryptonite" which featured the number one played single of 1993 "Two Princes". Since then we installed the MegaMix InBoard Series system and recently mixed the new Spin Doctors.... "Turn it Upside Down", Mick Ronson "Heaven and Hell" and The Hatters." Peter Deneberg  
Co-Producer Spin Doctors  
Co-owner Acme Recording

**CALL NOW! 1-800-762-9266**  
a division of CTI Audio, Inc. 341 Harbor St. Conneaut, OH. 44030





**YOU** probably started with a cheap guitar or maybe some parentally-mandated piano lessons. Picked up an entry-level amp and an effects box or two along the way. But as you got deeper into it, you realized that your music was becoming much more than a passing fancy. Maybe a career. Definitely a passion. By now, you've upgraded your instrument, your amp, your mixer and recorder, and above all, your proficiency.

## Now you're ready for Eventide

We've got something special for you. It's not another lower-quality, limited bandwidth effects box hiding behind a pro audio brand name. We've done something better. We've lowered the price on our best-selling professional H3000 brand effects processor, while adding powerful dynamic effects and hundreds of brand new presets from top names such as Joe Satriani, Vernon Reid, Bob Bradshaw, Matt Henderson, Mesa Boogie, Steve Vai and more. And we've taken nothing out... the new H3000D/SX gives you exactly the same no-compromise design and effects quality that has shaped the sound of more pro artists and recording studios than any other. **You get it all:** Diatonic pitch shift, six-octave MultiShift, killer reverbs, and the incredible Mod Factory modular algorithm construction kit.

**But you get it all for many**

**hundreds less.** The H3000D/SX is the first Eventide Ultra-Harmonizer processor to sell for under \$2000.



If you're serious about your music, it's the one machine that can propel your creativity to the next level.

NEVER UNDERESTIMATE THE POWER OF AN EVENTIDE **HARMONIZER**  
brand effects processor

Eventide products are available only at specially selected music stores and pro audio dealers. Call 1-800-446-7878 and we'll point you in the right direction.

**Eventide**  
the next step

One Alvan Way, Little Ferry, NJ 07643  
Tel: 201-641-1200 • Fax: 201-641-1640

CIRCLE 31 ON FREE INFO CARD



# MIDI TIMELINE

**1982:** Roland contributes a substantial amount to the USI spec regarding timing, the name MIDI is chosen, and in December the Sequential Prophet-600 ships to become the first product with MIDI.

**1984:** JLCoper introduces a MIDI-controlled lighting unit. Roland's SBX-80 bridges SMPTE and MIDI. Yamaha unveils the D1500, the first signal processor to respond to MIDI program changes. E-mu's Emulator II, with 17 seconds of sampling time, has people flying in vocals and triggering sound effects from MIDI.

**1986:** JLCoper shows MAGI, a 16-channel MIDI automation system, and MIDI Mute, with 8 channels of sequencer-controlled muting; MID Inc.'s Megamix provides PC-controlled automated mixing; and Akai's MPX820 debuts as the first MIDI-controlled, stand-alone snapshot mixer. Clarity's MIDI/XLV automates the Lexicon 224XL via MIDI, Lexicon itself ships the PCM70 (the first signal processor to use MIDI to control individual parameters via continuous controllers), and Southworth's JamBox MIDI interface breaks the two-cable output barrier for the Mac.

## 1981

**1981:** Dave Smith of Sequential Circuits presents a paper on a Universal Synthesizer Interface at the New York AES convention in November.

**1983:** At NAMM, the Prophet-600 and Roland JP-6 talk to each other through MIDI. In the summer, Yamaha introduces the DX7, and the MMA (MIDI Manufacturers Association), JMSC (Japan MIDI Standards Committee), and IMA (International MIDI Association) are formed.

**1985:** Atari introduces computers with MIDI ports and takes over the European market. Sound Designer mates the Mac with digital audio. Southworth, Mark of the Unicorn, and Opcode introduce MIDI sequencers. E-mu's SP-12 is the first SMPTE/MIDI-compatible drum machine.

**1987:** The MMA ratifies MIDI Timecode (MTC) to interface MIDI to SMPTE, and the Sample Dump Standard to link MIDI and digital audio. The Iota MIDI fader provides 8 channels of MIDI-controlled faders for under \$500. Digidesign's Q-Sheet implements MTC and provides SMPTE-based Mac automation of MIDI events. ADA releases the MP-1, a MIDI-controlled tube pre-amp for guitarists.

# MIDI & THE PROJ



**1988:** Alchemy sends digital audio over SCSI to an Ensoniq EPS and Emulator III. Digidesign introduces its first DSP board for the Mac II family. DigiTech provides affordable, MIDI-controlled harmonization with the IPS-33. Alesis releases the QuadraVerb, one of the most enduring MIDI-controlled signal processors.

**1990:** The MMA ratifies Bank Select, circumventing MIDI's 128-program limitation. Opcode's StudioVision combines hard-disk recording and MIDI sequencing on the Mac. Digidesign releases DECK for the Mac (four tracks of digital audio with standard MIDI file playback) and SampleCell, a Nubus-compatible sampler on a card.

**1992:** Fostex, Atari, Dr. T., Steinberg, and C-Lab create an integrated MIDI controlled tape system. MMA ratifies MIDI Machine Control, further cementing the relationship between MIDI and the studio.

**1994:** AIAMP (Association of Interactive Audio and Music Professionals) becomes a special interest group of the MMA. QuickTime 2.0 adds MIDI. Apple develops sound fonts.

**1989:** Lone Wolf releases the MIDITap, a MIDI network oriented toward the studio. Digidesign introduces Sound Tools, the engine on which integrated MIDI sequencers/hard-disk recorders will be based. Tascam releases the 688 MIDISudio, while Fostex's R8 multi-track recorder and companion MTC-1 MIDI control box are the precursors of MIDI Machine Control.

**1991:** In a flurry of additions to the MIDI spec, the MMA ratifies MIDI Show Control (for MIDI control of multimedia and theatrical events), Standard MIDI Files (cross-platform file format for sequences), and General MIDI, which defines a general-purpose MIDI sound playback engine. Opcode releases OMS, a MIDI operating system for the Mac.

**1993:** Multimedia starts to really take off. The installed base of zillions of sound cards for the PC includes MIDI interfaces. Creative Labs buys E-mu Systems. MIDI is firmly established beyond its music industry origins into both the pro audio and consumer markets.

**Late 1994:** EQ Magazine sets the MIDI story straight with the definitive timeline and the ultimate collection of tips and techniques for MIDI in project recording. They call the collection by the perfect sobriquet:

**1994**

# ECT STUDIO NOW



# MIDI OVERVIEW

Making the most of MIDI (and then some)

BY CRAIG ANDERTON

WHEN ALEXANDER Graham Bell invented the telephone, he probably didn't envision phone sex, voice mail, Dial-A-Prayer, modems, and people with cellular phones cruising the L.A. freeways. Similarly, those behind the MIDI spec didn't expect it to revolutionize the world of recording.

Yet inventions have a way of taking on a life of their own. MIDI was responsible for some of the major recording advances of the last decade, such as virtual tracks. For the first time, the multitrack tape monopoly started to crumble. Some musicians dispensed with tape altogether and used sequencers driving MIDI instruments in real time to cut music in genres ranging from new age to techno.

What does MIDI mean to the future of the recording studio? Plenty. MIDI Machine Control has gained substantial industry support and already the major sequencer programs send out the commands needed to make MMC machines leap into action. MIDI Show Control (see my MI Insider column in last month's issue) is ideal for both stage and studio, but is also perhaps the best way yet to control sophisticated multimedia productions. And MIDI-controlled signal processors just keep getting better.

And there's more. This issue features the latest news on several developments that link MIDI and the project studio:

- Steve La Cerra reports on MIDI automated mixdown and console



Photo by Ed Aiona

automation. It all started when the MIDI spec defined a particular controller as master level. Not only did synths and drum machines adopt this protocol so you could mix from a sequencer; so did automation boxes with MIDI-controlled faders that let you mix taped tracks as well.

- Paul Lehrman and Tim Tulley guide you through the world of MIDI Machine Control. The idea of having a tape recorder follow your sequencer was fantasy until Postex, with help from Atari and several software companies, came up with a preliminary version of MIDI machine control. Now you can also track enable and do other recorder-related tasks without having to move from your monitor or leave your sequencer.

- Yours truly gives the lowdown on automated signal processing so

you can take advantage of this powerful technique. MIDI dealt with the "not enough hands" problem once and for all by allowing real-time parameter changes in signal processors as well as in synths and samplers.

- David Miles Huber demystifies SMDI (SCSI Musical Data Interchange), the logical successor to the Sample Dump Standard that's fast enough for the digital audio age.

- And what ties all of this brave new world together? We round out the section with an article for the pliers-and-wires crowd on how to build your own MIDI cables.

As an added bonus, we've thrown in a MIDI Buyer's Guide to show you some of the great MIDI stuff that can change your project studio.

If you haven't jumped on the MIDI handwagon, now's the time. **EQ**

## THE MYTH OF "SLOW MIDI"

Those who say MIDI is too slow don't realize that, most of the time, problems in responding to MIDI lie within the device being controlled. A synthesizer, for example, might take 5 milliseconds to respond to a 1 millisecond MIDI command. Even if you quadrupled MIDI's speed, the synth would have to respond an order of magnitude faster for the MIDI speed increase to make any difference. Economically, this simply isn't feasible.

MIDI does run out of steam when massive amounts of continuous controller messages go down a single line, as typically happens with mixer automation. Nonetheless, there are many ways around this. For example, the Niche ACM (MIDI-controlled, 8-channel fader) interpolates between MIDI data values to effectively create a far more dense data stream internally to the module. Also, the multiple cable concept, as popularized by Mark of the Unicorn's MIDI Time Piece, is applicable to mixers as well.

Finally, it's important to remember that not everything on a console moves all the time. In fact, snapshot automation (which is very economical in terms of memory) can handle most of the work, with a limited number of controls operated dynamically —CA



# Ten Reasons why **adat**<sup>®</sup> is the Digital Multitrack Recorder for YOU:

## 1. You want accessibility.

There are over 30,000 ADATs in use all around the world! Chances are, you already know of someone who has successfully recorded projects on ADAT.

## 2. You want dependability.

ADAT uses eight discrete tracks. You won't have to worry about losing that great lead vocal when recording on a neighboring track. *Other digital formats re-record adjacent tracks, even in safe mode!*

## 3. You want superior engineering.

The ADAT MultiChannel Optical Digital Interface™ is now a patented technology. There's no clearer choice for groundbreaking digital recording.

## 4. You want reliability.

Heavy duty S-VHS\* tape offers the widest track width and the best error correction of any modular digital tape recorder. From one ADAT to another, your tapes play flawlessly and last longer.

## 5. You want compatibility.

The ADAT Group™ of third-party manufacturers continues to develop products that set the standard in their class. Digidesign, Fostex, Apogee, Roland, Korg, JL Cooper, Steinberg/Jones, E-mu, EMagic and dozens more have all signed on and are making great use of ADAT's proprietary interfaces.

## 6. You want the best audio quality.

ADAT employs 64x oversampling analog-to-digital converters and 18-bit low-noise DACs for state-of-the-art sound.

## 7. You want cutting-edge technology.

At ALESIS, digital audio is what we do. We always have. We stake our success on it. Our custom ASIC chips make the ADAT lighter, cooler and more reliable than other digital multitrack recorders.

## 8. You want affordability.

The ADAT Digital Multitrack Recording System, featuring the BRC™ Master Remote Control, is available at a fraction of the cost previously associated with digital recording. You can't afford NOT to buy ADATs if you're serious about recording.

## 9. You want networking.

With the advent of the ADAT Worldwide Network™, thousands of songwriters, producers, engineers and studios now have unlimited access to each other. Creative collaborations around the world could not be made easier.

## 10. You want success stories.

ADAT recordings have already gone to the top of the Rap, Pop, Dance and Alternative charts, and received a 1994 Grammy award for "Best Country Instrumental Performance". Live recordings by platinum artists are now being readied for major label release.

**You want more? We could give you another 88 reasons why ADAT is the de facto standard in digital multitrack recording, but the best thing for you to do is to see and hear it for yourself.**



ADAT MultiChannel Optical Digital Interface, ADAT Worldwide Network, BRC and The ADAT Group are trademarks of Alesis Corporation. \*VHS is a registered trademark of JVC. All other trademarks are the property of their respective holders. © Alesis and ADAT are registered trademarks of Alesis Corporation.

**Alesis Corporation** Phone: 1-800-5-ALESIS (In North America Only) / E-mail: ALECORP@Alesis1.usa.com  
3630 Holdrege Avenue Los Angeles CA 90016



CIRCLE 02 ON FREE INFO CARD



# ALL THE RIGHT MOVES

MIDI console automation makes sure your faders go where you want them to

BY STEVE LA CERRA

THE PROLIFERATION of affordable recording equipment has brought a case of "mores" to the project recording studio. *More* tape tracks, *more* effects, *more* virtual tracks, and *more* input channels. Having all this gear is great, but it can mean a big headache when it comes time to mix down. With so many inputs routed into the console, mixing chores become difficult for any mere mortal to handle.

Although the optimum situation would be to have a Neve or SSL automation system, most project studio owners are working with much more modest budgets. While total recall is generally out of the project studio budget, mutes, fader control, and panning are within easy reach owing to the availability of MIDI-based automation systems. MIDI-based console automation can be purchased at realistic prices and most offer many of the conveniences of blue-chip systems.

### LET'S GET SOMETHING STRAIGHT...

There are two basic types of MIDI automation systems: onboard and

third party. An onboard automation system comes factory installed as an integral part of the recording console. A third-party system can be added to most consoles at any point in time and requires both software and hardware additions to your audio system. We are not talking about using MIDI controller 7 to change the output level of a synth. Although this technique can be used to make level adjustments to a synth during a mixdown, think about this: if you take the time to get a clean signal-to-noise ratio by adjusting the channel trim, fader position, and volume knob on the synth, does it make sense to upset that precariously balanced gain structure by messing with the MIDI volume of the synth?

What we are referring to is the ability to automate the channels of your mixing console while maintaining optimum S/N ratio.

### ONBOARD MIDI AUTOMATION

Over the past two years, the number of available consoles offering onboard MIDI automation has dramatically increased. Only five years ago the power

offered by such consoles was unheard of at current prices. There are now consoles priced under \$1000 that offer optional MIDI mute and fader automation. Most MIDI automation systems will require a computer-based sequencer into which the data will be recorded. If your goal is to be able to automate mixdown of tape tracks, then a SMPTE-to-MIDI interface will be needed to lock the computer to the tape machine.

MIDI muting is the most basic of onboard systems, allowing only channel mute on/off to be performed automatically. While this does not sound like much, it can actually offer a lot of flexibility in the mixing process (for more specific information see *EQ's* upcoming guide to 8-bus consoles). The mute button on each channel has a corresponding MIDI note number. When you press a mute button on the console, a MIDI "note on" command is sent from the board and recorded into a sequencer. Pressing the mute button a second time will result in a "note off" command. Having said that, MIDI mute data could be recorded into any sequencer, but if you plan to automate mixdown of tracks from a tape machine, the sequencer (or computer) must be able to lock to tape, preferably via SMPTE code.

The next step up in onboard automation would be MIDI fader control. The faders in the console will typically be VCA (Voltage Control Amplifier) faders, meaning that the signal in each channel is routed through an additional amplifier. Some people feel that VCAs have an audible effect on the signal, but within this price range the chance of getting moving faders is really small. Manual fader moves are usually recorded into the sequencer as MIDI volume messages (controller 7). Upon playback the sequencer outputs MIDI volume changes and the recording console interprets the data as fader "moves." When auditioning a console with onboard MIDI-VCA automation,



SLIP SLIDERS AWAY: CM AUTOMation's MIDlcam 2.0 and FX100.





#### INTERFACE-MAN: MIDIMAN Mac Syncman.

listen to whether or not the console is coloring the sound of the source signal. Some VCAs are more transparent (and quiet) than others and you do not want the automation to compromise the quality of the audio.

Since the MIDI protocol calls for 128 "steps" in any controller, using controller 7 to control a VCA will yield 128 different volume levels.

Some engineers do not feel that this amount of resolution is enough, but keep in mind that just because the MIDI controller offers 128 steps does not mean that the VCAs cannot fade smoothly between steps (and thus avoid "zippering"). The resolution can be increased to about 4000 steps if the system uses separate controllers for coarse and fine level adjustment. Twelve-bit systems also offer about 4000 steps (4096 to be exact), but you should listen for yourself to hear whether the difference is audible.

When you are evaluating the automation capabilities of a console for possible purchase, find out if the effect sends, effect returns, and tape returns can also be automated. Usually, the effect sends and returns can be muted but don't have VCAs in the signal path for level automation. On an in-line board, find out if the tape returns have VCA faders. If they don't, it's not a big deal provided that faders for the tape and channel paths can be swapped. If they cannot be swapped, then you can't automate mixdown of your tape tracks without repatching (a royal pain in the neck). Also look for VCA control over the left-right master, as this can be a real help in making accurate, repeatable fadeouts.

## CONSUME THE MINIMUM • PRODUCE THE MAXIMUM

WITH LOW-PRICED, HIGH-POWERED SOFTWARE FROM OSC



### DECK II™ \$399

DIGITAL AUDIO WORKSTATION SOFTWARE FOR MACINTOSH

DECK II OFFERS CD-QUALITY MULTITRACK HARD DISK RECORDING WITH TIMELINE-STYLE WAVEFORM EDITING, CONTINUOUS SYNC TO ALL SMPTE FORMATS, UNLIMITED VIRTUAL TRACKS AND DIGITAL MIXING, REAL-TIME MOVING FADER AUTOMATION, SYNCHRONOUS QUICKTIME MOVIE PLAYBACK DIRECT FROM DISK AND TANDEM OPERATION WITH METRO FOR INTEGRATED MIDI + DIGITAL AUDIO. FOUR TRACKS ON DIGIDESIGN SOUND TOOLS II/AUDIOMEDIA™, SIX TRACKS ON SPECTRAL INNOVATIONS NUMEDIA™ CARDS AND 660AV, EIGHT TRACKS ON PRO TOOLS™ & MACINTOSH 840 AV. 660/840AV - NO AUDIO CARD REQUIRED!

DECK II won the 1990 and 1993 MacUser Eddy Award for Best New Music & Sound Product



### METRO™ \$225

METRO IS OSC'S PROFESSIONAL MIDI SEQUENCER, WITH THE FEATURES YOU EXPECT FROM A HIGH-END SEQUENCING PACKAGE PLUS A SIMPLIFIED INTERFACE AND FULL BACKGROUND & FOREGROUND SYNCHRONIZATION WITH DECK II. METRO INCLUDES SUPPORT FOR GALAXY™, UNISYN™, OMS, MIDI MANAGER AND MIDI TIME PIECE™.

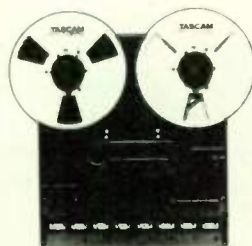


CALL OSC AT 1-800-343-DECK TO LEARN MORE.

CIRCLE 49 ON FREE INFO CARD

## RECORDING EQUIPMENT

—All Major Brands—



### FOR STUDIOS/HOMES CHURCHES/CLUBS

- Reel to Reel Decks (2-4-8-16-24 Track)
- Cassette Decks • Mixing Boards
- Mikes • Studio Monitor Speakers
- Special Effects Units Accessories

**TASCAM**  
TEAC Production Products

- VOLUME DEALER
- NEW & USED
- E-Z TERMS
- ALL MAJOR CREDIT CARDS
- PROFESSIONAL ADVICE

Call for pricing information.

## RHYTHM CITY

1485 NE Expressway  
Atlanta, Georgia, 30329  
1-404-320-SALE • 1-404-320-7253  
Special Pricing for Package Systems.



CIRCLE 69 ON FREE INFO CARD







**44.046-to-44.1 CD-to-DAW  
DAW-to-DAT 32K-to-48  
DAW-to-D2 CD-to-DAT  
DAT-to-1630 DAT-to-DAT  
48-to-44.056 DAT-to-D2  
DAW-to-Digital Console  
Varispeed-to-44.1K  
DAW-to-Digital Multitrack**

**Finally! Solve your digital audio copy problems for just \$2595...**

Your customers want "all digital." Now you can give it to them with Roland's new SRC-2 Dual Sample Rate Converter. It's getting rave reviews from customers. "It sounds great!" "Very innovative--a remarkable design." "I can crossfade and mix with the two digital inputs--fantastic!" "I intend to buy at least three of these units; every room will need one..."

Roland's ASIC chip set, two years in development, is what made this "leapfrog" sample rate converter design possible. So now the A/D, D/A signal degradation you've had to put up with is gone. And your "all digital studio" can really be...all digital!



© Roland Corporation U.S. 1994

For the solution to all your digital copy problems, call Roland at (213) 685-5141 ext. 337 or FAX (213) 722-0911.

**CIRCLE 58 ON FREE INFO CARD**



THE SOUND SOURCE

THE BEST NAMES, PRICES &amp; SERVICE!

1(800) 800-4654

IN FLORIDA DIAL  
(813) 885-9644  
FAX (813) 881-1896  
MAIL ALL  
CORRESPONDENCE TO  
PO BOX 8009  
TAMPA, FL 33674-8009

THOROUGHbred

MUSIC INC.

The World's Most Dynamic Music Store!

SAME DAY SHIPPING FROM OUR HUGE INVENTORY

CIRCLE 65 ON FREE INFO CARD

SAVE  
50%  
on your next  
duplication order!



## THE KABA SYSTEM OFFERS YOU:

- ★ HIGHEST QUALITY REALTIME & DOUBLETIME OPTION
- ★ COST EFFECTIVE - 4 TRACK HEADS!
- ★ EXPANDABILITY
- ★ 10,000 HOUR TRANSPORTS
- ★ 20-20 KHz FREQUENCY RESPONSE

## COME SEE US AT THE

AES SHOW BOOTH #1526 MUSIC EXPO  
NOVEMBER 10-13, 1994 NOVEMBER 5-6, 1994  
SAN FRANCISCO, CA SAN JOSE, CA

WHETHER YOU HAVE SOMEONE  
PRODUCE YOUR TAPES & CD'S  
FOR YOU OR YOU WANT TO DO IT  
YOURSELF, KABA IS THE NAME  
TO KNOW.

FOR A LIMITED TIME, KABA WILL  
APPLY 50% OF YOUR NEXT CASSETTE  
DUPLICATION ORDER TOWARDS THE  
PURCHASE OF YOUR OWN  
KABA 4-TRACK REALTIME  
DUPLICATION SYSTEM.\*

\*SOME RESTRICTIONS APPLY,  
CALL FOR DETAILS.



SERVING MUSICIANS WORLDWIDE FOR OVER 20 YEARS

**KABA AUDIO PRODUCTIONS**  
**KABA RESEARCH & DEVELOPMENT**

24 COMMERCIAL BLVD., NOVATO, CA 94949  
800/231-TAPE • 415/883-5041 • FAX 415/883-5222

CIRCLE 43 ON FREE INFO CARD

## MIDI &amp; THE PROJECT STUDIO

there should be inserts on the channels. If you are lucky enough to have a board that has inserts on both the channels and the tape returns, you can automate both these signal paths.

A third-party automation system will consist of several basic parts, the first of which will be some sort of hardware device to interface with your console. The interface is typically a rack-mount box with a bank of VCAs inside and a series of input and output jacks on the front or rear panel. The number of channels per interface varies with manufacturer. The send part of your insert is patched to the interface input and the VCA output of the interface is patched to the return of the insert. If your console does not have inserts, it might be possible to patch the automation interface between the outputs of the tape machine and the tape inputs on the console. While this arrangement will technically work out, it might leave you with less flexibility than if channel inserts were used. Interfaces are available with both balanced and unbalanced inputs; those with balanced I/Os usually cost a bit more.

The next part of the system would be some sort of MIDI fader control device. The audio signal never actually passes through these faders — they are used to send control voltages to the VCAs in the hardware interface, which in turn raise and lower signal levels. When you are mixing, the faders on your console are usually set to unity gain and left there. The faders on the control device are used to send MIDI data into a software program on your computer. Since a typical fader control device provides eight faders, make sure that the device can be easily switched to control all of the VCAs in your system. For example, the FX-100 from CM Automation has eight 100 mm faders, but they can be switched in banks across a total of 64 channels, facilitating the control of large mixing consoles.

Finally, you will need some kind of program to record the MIDI data and then play that data back to the hardware interface. Any MIDI sequencing program can be used, or there are programs specifically written for the purpose. JLCopier offers FaderMaster Pro Remote software to complement its FaderMaster Pro MIDI controller unit, as well as Softmix, an

continued on page 116



# MIDI ET MACHINA

MIDI Machine Control lets you take the next step in automation

BY PAUL D. LEHRMAN AND TIM TULLY

*THE FOLLOWING is an excerpt from MIDI For The Professional [Amsco].*

The traditional way of interfacing a tape deck with a MIDI sequencer and tape is to have the tape deck be the master to which the sequencer is slaved. This has served the MIDI community well, working with both audio and video tape, for nearly a decade. But there are situations in which it might be worthwhile to reverse this situation.

For MIDI users, control of physical tape transports is a logical extension of the computer-based studio. Synthesizers do the music, samplers do the effects, and processors process, all of them under MIDI control, with a computer running a single, integrated, user-friendly program at the front.

In strict terms, the only way for the sequencer to really be the master would be if it were to generate SMPTE timecode and/or house sync. In most studios that would be an unnecessary duplication of hardware, and has so far proven impractical. Nonetheless, it's quite possible to construct hybrid systems that make it seem to the user that the computer is in charge.

MIDI Machine Control (MMC) codifies this idea into the MIDI spec. MMC can work alongside MIDI Timecode (MTC), SMPTE timecode in either longitudinal or vertical form, or any combination of these.

MMC in many ways emulates, and is designed to work alongside, the EBus standard developed for audio and video transport control. It's cheaper to implement than EBus (especially if you already own a lot of MIDI equipment and don't want to buy a bunch of converters), and should therefore see its primary use in gear at the lower end of the price spectrum. In addition, because it's part of MIDI, it provides links to sequencers, computers, and instruments that EBus cannot address.

MIDI Machine Control Systems can be broken down into three basic categories: An MMC system can be set up as an "MMC: open-loop," in which a central transmitter broadcasts messages to all of the receiving devices. A second possibility is an "MMC: closed-loop," in which the devices respond to the transmitter in some way and send messages back to it. A third is an "MMC: quasi-open-loop," in which MMC commands travel one cable, while MTC numbers travel another.

## OPEN-LOOP

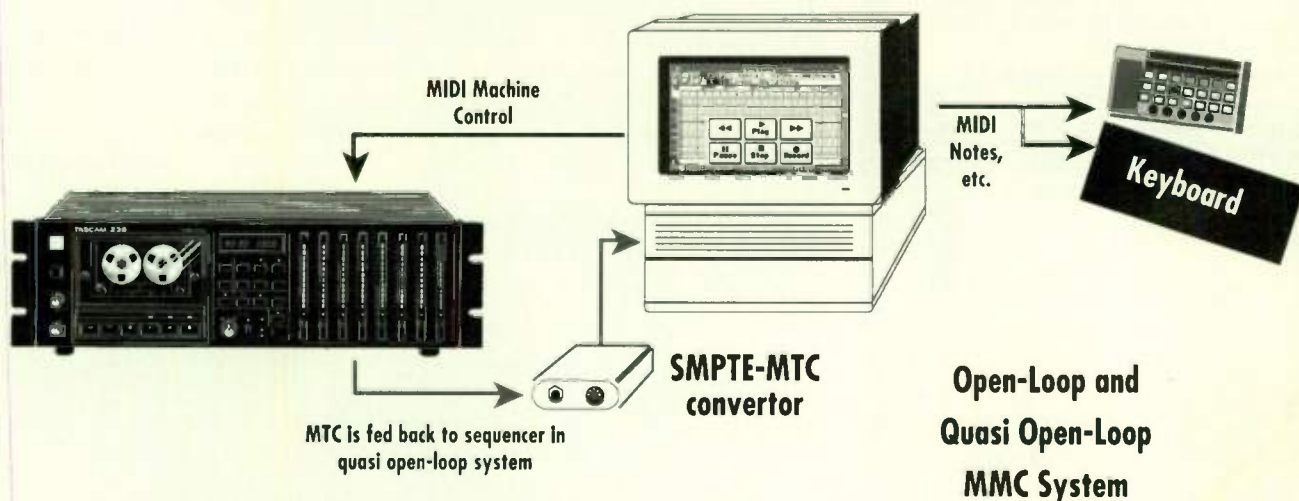
The open-loop is the simplest of the MMC systems. In this system, the tape transport (or its controller or autolocator) has a MIDI In jack. The MMC transmitter — an edit list program on a computer, for example — tells the

transport when to start or stop, rewind or fast-forward, and go in and out of record in real time. Locating is the job of the tape deck itself, but the computer can act as a remote controller for the deck's own locating functions.

In one scenario, for example, the computer tells the transport to note the current location of the tape (using whatever mechanism it has for a counter) and to record that number in a memory register within the deck. Any time after that, the computer can tell the deck to recall that memory location and cue the tape to it. Since the numbers are based on the deck's own counter, there doesn't have to be any SMPTE timecode involved.

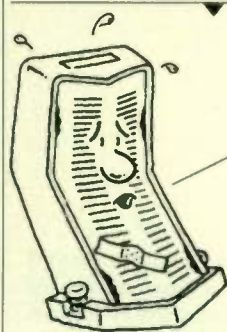
SMPTE timecode can be used with an open-loop system if the deck is sophisticated enough to use SMPTE instead of a tach-pulse system for its own location functions. In that case, the MMC controller can send frame numbers to the tape deck instead of just location-register numbers.

Regardless of whether it has SMPTE capability, the transport in an open-loop system sends no data back to the computer, so there is actually no direct synchronization between the tape and the computer, which makes this not very practical in a sequencing environment.





# TALKING HEADS



*I'm so worn!  
Edge tracks  
bounce...I'm  
way out of  
spec...Am  
I done for?*

*No! Go to JRF.  
I did, and now  
I spec out  
like new!*



- ▶ HEAD RELAPPING
- ▶ OPTICAL ALIGNMENT
- ▶ NEW REPLACEMENT HEADS



(201) 579-5773  
Fax (201) 579-6021

MAGNETIC SCIENCES

249 Kennedy Road, Greendell, NJ 07839

CIRCLE 42 ON FREE INFO CARD

## LEIGH'S

MIDI Mail Order

### Fall Special

## the JAMMER

Professional™  
for Windows

**ONLY \$159.00**

Take a seat in the Producer's chair and get ready to create a musical masterpiece. Built in Studio Musicians create original drums, drum fills, bass parts, rhythm guitars, keyboards and melodies for you in a 256 track sequencer. You control it all.

Made in the USA by **Soundtrek**



To Order Call LEIGH'S MIDI Mail Order  
(USA) 800-321-6434 (CANADA)  
Ph: 215-658-2323, FAX: 215-896-4414  
144 W. Eagle Rd., Havertown, PA 19083

CIRCLE 44 ON FREE INFO CARD

## MIDI MACHINE CONTROL UPDATE

In the two years since MMC became part of the MIDI Spec, a variety of manufacturers have implemented the new protocol in their products. Here's a sampling:

The new modular digital multitrack decks use MMC as their "native" communications protocol. Alesis uses it to talk between its ADAT deck and its Big and Little Remote Controls; Fostex uses it for its RD-8, to handle track arming, punches, and all major transport functions; and Tascam incorporates it into the SY-88 sync card that installs in its DA-88.

On the analog side, the Fostex MTC-1 interface for the R-8 multitrack deck and the 8330 sync card for the G-series decks now use MMC for communications between the deck and a computer. The company's GT-10 "multimedia" multitrack analog cassette deck has a MIDI jack for MMC built right in. Tascam's MMC-100 receives MMC commands and converts them to the company's serial protocol for control over a number of models of cassette and reel decks.

Among hard-disk multitrack systems, Akai's DR4d has a new software upgrade that takes full advantage of MMC, including near-instantaneous looping in conjunction with Mark of the Unicorn's (MOTU) Performer software. Digidesign's ADAT Interface uses MMC to communicate between its PC-based Session 8 system and one or more ADAT-format decks. A similar system for Pro Tools is to be released shortly.

Among software programs, in addition to Performer, MMC commands can be found in the "AV" versions of Opcode Systems' Vision family of sequencers. Steinberg's Cubase has implemented MMC in most of its versions, as well as software control modules for ADAT, RD-8, and DR4d. Passport Designs has a full MMC instruction set built into its Producer Pro software. Emagic has included basic MMC controls in its Logic family since 1992, while the most recent versions include features such as 64-track addressing on ADAT and RD-8 decks, group recording of both tape and MIDI tracks, and selectable crossfade times.

New kinds of hardware designed specifically to take advantage of MMC are also available. Alesis's AI-2 interface for audio/video sync, built by Timeline, interfaces MMC devices and ADAT-compatible decks with Sony P2 and 9-pin serial video protocols, as well as SMPTE timecode. Steinberg has its ADAT Computer Interface, which can control up to 16 digital multitracks using MMC and MIDI Timecode without sacrificing a tape track to SMPTE timecode. Penny & Giles's MM16 MIDI management system boasts five transport buttons already preprogrammed to send MMC commands, as well as 16 additional buttons and inputs for two footswitches that can be programmed to send MMC, sys-ex, or any other MIDI command. JLCoeper Electronics's CuePoint Autolocator can control up to four MMC-compatible decks. JLCoeper also makes Datasync, which converts ADAT transport commands to MMC so that the deck can control a sequencer that reads MMC; and Datamaster, which converts transport control and sync signals in either direction. MOTU's Digital Time Piece is the most ambitious MMC product yet: besides MMC, MTC, and SMPTE, it reads and writes word clock, ADAT sync, DA-88 sync, Digidesign's Superclock, and video sync, plus it converts MMC to Sony 9-pin control. On an optional daughter card, it can also generate Vertical Interval Time Code (VITC) and black burst.

—Paul D. Lehrman





### QUASI-OPEN-LOOP

A quasi-open-loop system is a bit more complex. It promises to be the most common setup in MMC-oriented music production studios, where direct synchronization between recorded tape (audio or video) and MIDI is necessary, but only a single tape transport needs to be addressed. The transmitter sends MMC commands to a tape transport. The tape on the transport has a SMPTE stripe. A SMPTE-to-MTC converter sends MTC numbers back from the transport to the controller over a separate MIDI cable.

In this case, the sequencer can act directly as the autolocator, and autolocate points can merely be markers in the sequence. When you move the sequencer to a marker, an "immediate locate" command with a SMPTE/MTC frame number is sent to the deck. The tape deck's own controller (which either talks SMPTE or knows how to translate this frame number into its internal counter numbers) tells the deck to go to that spot and stop. Then when the sequencer is told to start, it immediately commands the tape deck to start playing first. MTC is sent back to the sequencer, and only then does it start to play, locked to the tape.

One nice potential feature of this system is that when it's used with a multitrack tape deck, the sequencer can operate and display the tape tracks in the same way that it handles MIDI tracks. The sequencer can turn on and off individual track record-enables and handle punch-ins and -outs (either pre-cued or in real time). It can keep track of which tape tracks have had music recorded on them (as long as the tape deck is only operated from the sequencer and never manually), and show them in the same window that MIDI tracks are displayed — instead of using MIDI tracks as "virtual tape" tracks, we now have a situation in which tape tracks are "virtual MIDI" tracks!

### CLOSED-LOOP

A closed-loop environment is the most complex and also the most flexible. Closed-loops allow the use of multiple transports — analog, digital, cassette, disk-based, and video — under one controller. The master controller can periodically send an inquiry message to, or "strobe," the various machines and find out their locations, the record statuses of their individual tracks, and even what types of commands they will respond to, using a special message called a "signature message," so the controller will know what to send to each transport. The divisions between the

machines can be invisible; they can be controlled together as one giant "virtual" deck, with up to (according to the spec) 317 tracks per machine!

Messages, both MMC and MTC, can be sent back from the transports in real time, either as they run or just when they're stopped, so the controller has a constant picture of where every machine is and what it's doing.

### AN MMC STUDIO SESSION

Let's describe a simple example of MMC

in action. The heart of the system is a device — we'll call it a "translator" — that translates MMC commands into serial commands for controlling a specific multitrack tape deck. Let's assume the translator is designed to be used in closed-loop mode, and receives MIDI Timecode on the same cable as the MMC responses, and that in addition to MMC-to-serial conversion, it also handles SMPTE-to-MIDI conversion. Let's also give it some internal memory for storing information about the transport it's connected to.

## THANK YOU EQ READERS!

*An open letter from Morris Ballen, Disc Makers Chairman*

Dear Friends,

A hearty "thank you" to the readers of EQ Magazine. You've helped make Disc Makers the number one independent CD and cassette manufacturer in the nation! We couldn't have done it without your overwhelming support.

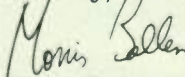
Why is Disc Makers such a successful national company? I think it's because we put as much effort and hard work into your graphic design and printed inserts as we put into your audio quality.

Musicians and producers who want major-label-quality audio as well as graphics know that Disc Makers offers the best value in the country. Our graphic design department specializes in making your inserts look like a major-label product. Best of all, **two-day shipping is our policy**; we offer Federal Express shipping on CDs and cassettes at UPS Ground freight rates! And who else offers a "no fine print" money-back guarantee? We won't rest until you're thrilled with your graphic design proofs and audio tests, or you get all your money back!

If you haven't seen our **brand new 1994 full color catalog**, call today for your free copy. We offer the most complete packages in the industry and, best of all, we provide the **fastest turnaround**. See for yourself why serious producers and musicians insist on using Disc Makers.

To all of our clients and friends — thank you for working with us. To our prospective clients — give us a try, you'll be delighted that you did. After all, you've worked hard to get the best recording, why not get the best CDs and cassettes you can?

Sincerely,



Morris Ballen, Chairman



P.S. All our CD packages include our exclusive Proof Positive™ Reference CD at no extra charge.

#### What is the Proof Positive™ Reference CD?

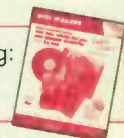
Disc Makers has solved a problem facing the record industry for the past 10 years: Can I get a CD test pressing? Until now the answer was always: No. If you wanted to hear a proof you would get a reference cassette (not CD-quality) or a DAT (most folks don't have a DAT player). Now, the engineers at Disc Makers have pioneered the Proof Positive™ Reference CD, an identical copy of what your finished CDs will sound like. We make two CD masters simultaneously, and send you one for approval. As soon as you approve it we use the other master for manufacturing. This process eliminates the Sony 1630 generation (to avoid CRC and interpolative errors), and is included at **no additional charge** in every Disc Makers CD package. The Proof Positive™ Reference CD is easy, convenient, and perfect: You get what you hear!

Call today for our new 1994 full color catalog:

**1-800-468-9353**

**DISC MAKERS**

1328 North Fourth Street • Philadelphia, PA 19122 • Outside USA call (215) 232-4140 • FAX (215) 236-7763



AV10394 19



# If You Program MIDI, You'll Love DrumTrax!

## Not Everyone is a Great Drum Programmer...

Even the good ones need new ideas and shortcuts. That's why so many MIDI arrangers start with the "Real Feel" drum patterns from DRUMTRAX.

Our patterns sound live because many of them are actual performances by world class drummers. You'll love the convenience of having this library featuring over 4800 measures of grooves and fills. All in a variety of musical styles available at the click of a button.



DRUMTRAX takes the tedious work out of producing hot drum parts which gets you right to the business of songwriting and arranging. Whether you're a beginner or a busy pro, if you program MIDI you'll love...

# DRUMTRAX™

THE DRUM PATTERN LIBRARY FOR MIDI SEQUENCERS

DRUMTRAX is available for PC, Macintosh and Atari Systems  
For Information & the Dealer Nearest You Call: (617)-387-7581 Fax: (617) 387-1059  
DRUMTRAX, 51 Pleasant Street, Suite 218, Malden, MA 02148

CIRCLE 93 ON FREE INFO CARD

**"If you're dead  
serious about a  
career in audio,  
IAR is the place  
to be"**

**Yoram Vazan**  
IAR Graduate,  
Audio Engineer & Owner  
Firehouse Recording Studios  
NYC

Clients include:  
Public Enemy  
("Greatest Misses," Gold);  
DAS EFX ("Dead Serious,"  
Platinum); Spike Lee ("Mo  
Better Blues," featuring Gang  
Starr); EPMD; MC Lyte

**Expanded 9-month  
Recording Engineer  
Program  
Start your career in  
less than a year!**

"IAR's program is very professional, highly technical, and offers plenty of creative opportunities. It's the perfect combination of intensive coursework and real world practical training — exactly what I needed to design, build and operate Firehouse."

**800-544-2501 212-777-8550** (NY, NJ, CT)

**Institute of Audio Research**

64 University Place Greenwich Village, New York 10003  
Lic. by NYS Education Dept. / HS or GED Required / App. for Vet Training / Financial Aid if eligible

CIRCLE 92 ON FREE INFO CARD

## MIDI & THE STUDIO

In addition, we need a sequencer that transmits MMC commands as it locates within the sequence, enables and disables tracks for recording, and starts and stops the sequence.

The first thing to do is to stripe a track of the multitrack tape with SMPTE timecode. If the deck does not use a SMPTE-based autolocator, it needs to know how SMPTE numbers correspond to the numbers in its tach-pulse or capstan-revolution counter. This often requires some kind of intelligent "set-up" routine, which is handled by the translator. The translator keeps in its memory the relationship between SMPTE times and counter numbers, so it can use it later to calculate cue points.

Now the tape deck is ready to be controlled by a sequencer. A SMPTE offset time — the spot on the tape corresponding to the beginning of the sequence — is programmed into the sequencer. When the sequencer locates to any point in the sequence, it calculates the SMPTE frame number based on its internal tempo map and the offset time and sends it to the MMC translator in the form of a special MMC command that contains the frame number. The translator calculates the equivalent number for the deck's internal counter from the SMPTE number and, using its own serial protocol, tells the tape deck where to locate to.

When the sequencer is told to start, it doesn't play immediately, but first sends an MMC Start command to the translator, which in turn starts the tape. As the tape runs, it sends SMPTE to the translator, which converts it into MTC. The MTC goes back to the sequencer, which starts to play and locks to the tape.

At any time, the sequencer can tell the translator to set up record-enable switches on any track and load punch-in and punch-out points into any of several registers, for recording to begin or end on any track or combination of tracks. Or, it can perform these punches in real time. The deck itself can communicate back to the sequencer, telling it which tracks are in record and of any errors it encounters, so the user can know if things are going the way they're supposed to. The sequencer can display the tape tracks right alongside the MIDI tracks, showing which portions of which tracks on the tape have had audio recorded on them and which portions are available for recording additional material.

EQ

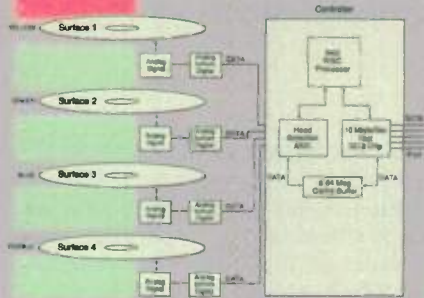


# AUDIO STORAGE.

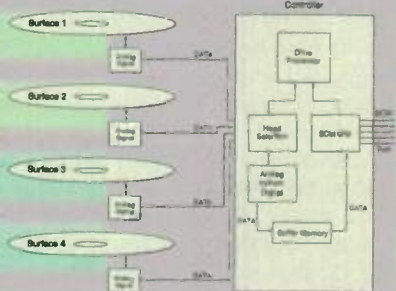
**Orray™ OPTICAL DISK DRIVE - 5.2GB**

**8 MB/Sec Data Throughput**

**Orray Architecture**  
Optical Disk Drive



**Hard Disk Architecture**



## FEATURES

- Patented multi-head/multi-channel architecture
- High sustained data rates
- 4 and 8 track recording capability
- Multi-parallel RISC processor system with 100 MHz of processing power
- Intelligent FAST SCSI II processor
- System appears as a standard SCSI direct access drive
- Flash EPROM for on-site firmware upgrades
- Inexpensive removable optical media sets
- Front panel display and key pad for diagnostics and device settings
- Plug and play for MAC, PC, Sun, HP, Silicon Graphics and others

**P**innacle introduces a new storage system designed especially for digital audio.

The Pinnacle Orray™ is the world's first optical drive system to utilize multiple heads and multiple disks – similar to hard disk technology. The Orray™ can perform as fast as most hard disk drives, with the added benefit of removable, reliable, inexpensive optical media. Each color-coded media set holds up to 5.2GB of data – perfect for most digital audio mixes. The Orray is available in a desktop model or 19" professional rack mount.

The Pinnacle Orray™ with its Patent Pending multi-disk/multi-channel

architecture offers sustained transfer rates up to 8MB per second with 4 and 8 track recording capability.

The versatility of the Pinnacle Orray™, with its intelligent RISC processor controller, allows for operation in multiple environments. In *streaming mode* the Orray™ can be used for digital video or audio. In *transaction mode* the Orray™ can be used as a file server or database storage system. All settings including operational modes, SCSI addresses, and status indicators are controlled and viewed from a front panel LED for easy access and identification.



The Pinnacle Orray™ is the most advanced storage system available today. It's the ultimate in unlimited storage. For more information call:

**800.553.7070**

**PINNACLE MICRO**

THE OPTICAL STORAGE COMPANY®

19 TECHNOLOGY • IRVINE, CA 92718, USA • (800) 553-7070 • INT'L (714) 727-3300 • FAX (714) 727-1913

Trademarks: Orray of Pinnacle Micro, Inc. All trademarks and registered marks to their respective owners.

**CIRCLE 94 ON FREE INFO CARD**

World Radio History



# THE ART OF TOTAL CONTROL, PART 1

MIDI is not just for keyboards — welcome to the world of MIDI signal processors

BY CRAIG ANDERTON

MIDI IS NOT just for keyboard players; any musician or recording engineer can use MIDI to control signal processors and to shape a sound into something unique. Whether live or in the studio, MIDI-controlled signal processing represents a new frontier that has been little explored. In this two-part series, Part 1 will explain the MIDI signal processor theory. Part 2 covers practical applications.

There are two main areas of control: program change commands can switch programs, while continuous controller messages affect individual effects parameters (echo time, filter

bandwidth, etc.). Both types of data can be generated by MIDI control pedals, footswitches, sequencers, keyboards, etc. (see fig. 1).

### PROGRAM CHANGES

Computer electronics brought about effects that could store different groups of control settings as individual programs. The original MIDI spec allowed for 128 MIDI program change messages. As usual, people wanted more — so now an extension to the MIDI spec, Bank Select messages, can select 16,384 banks of 128 programs — a total of over 2,000,000 programs!

### MIDI PROGRAM CHANGE "MAPPING"

The first mass-market MIDI-controlled signal processor, the Yamaha D1500 digital delay, responded to program changes issued by a master keyboard. If you changed programs on the keyboard, the delay could change to a complementary program — echo for strings, flanging for guitar, and so on.

It soon became apparent that you might not always want a one-to-one correspondence between synth and signal processor program numbers. For example, you might want to use the same signal processing program for a dozen different synth patches, but copying the program to 12 different locations in the signal processor world waste program memory.

Therefore, most signal processors provide a program change table that specifies which program will be called up in response to a particular program change message. You might program a table where program change message 12 calls up signal processor program 16, program change message 2 calls up signal processor program 47, and so on.

Mapping is also useful with devices that have more than 128 programs but do not allow for Bank Select. You could map, for example, program 125 to program 265. Although this would still allow you to access only 128 programs, they could come from a much larger "pool" of available programs.

### ABOUT CONTINUOUS CONTROLLERS

Changing from one program to another is a good start, but for more subtle effects it's vital to be able to vary individual parameters (brightness, reverb damping, decay time, etc.) within an individual program.

When you call up a program's parameter, you usually change its

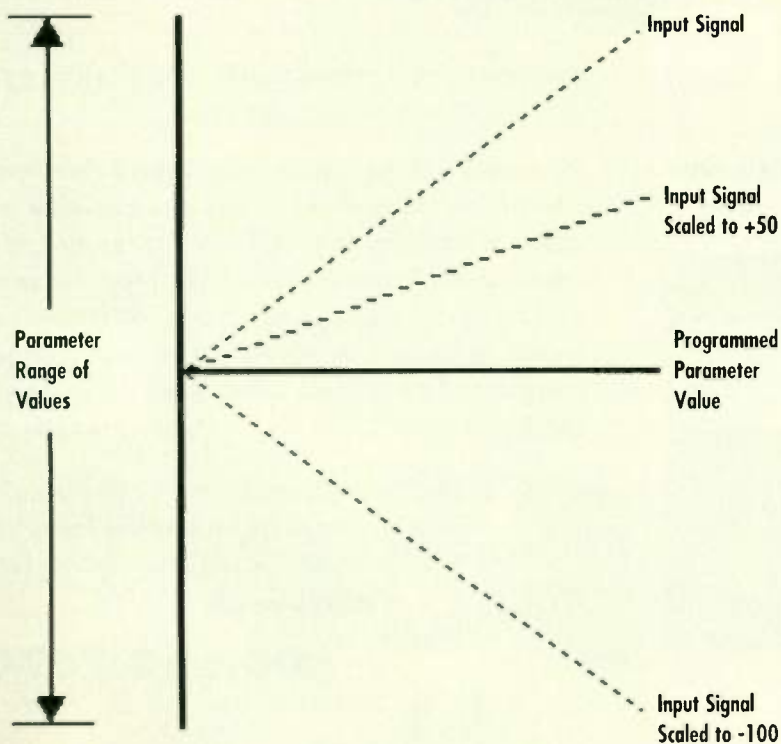


FIGURE 1: A basic MIDI-controlled signal processing system. The MIDI footswitch usually generates program change commands. In the studio, sequencer or keyboard control replaces footpedals and switches.





# Sennheiser MKH 80 studio condenser microphone

Whatever your situation  
the MKH family ensure  
accuracy and intelligibility  
in all aspects of recording.

## SUPER REBATE!

- Receive a certificate worth \$1000 in Sennheiser products when you purchase an MKH 80!
- Receive a certificate worth \$500 in Sennheiser products when you purchase an MKH 20, 30, 40, or 50!

Purchase as many MKH Series microphones as you like. See your Sennheiser dealer for details. Redeemable with Sennheiser (USA) directly, for retail value.

**LIMITED TIME ONLY**

Superb studio performance and the ultimate in flexibility: the MKH 80 variable pattern studio condenser microphone extends the outstanding quality of the Sennheiser MKH range.

The MKH 80 features exceptionally low noise, a wide range of audio control and a high dynamic range plus switchable pre-attenuation, HF lift and LF cut to compensate for proximity effects, and LED indicator for exact orientation.

The most versatile microphone designed for any recording situation.

ALL THE MICROPHONES  
YOU'LL EVER NEED.



## SENNHEISER

6 VISTA DRIVE, P.O. BOX 987, OLD LYME, CT 06371 • TEL: 203.434.9190 • FAX: 203.434.1759  
IN CALIFORNIA: 4116 WEST MAGNOLIA BLVD, SUITE 100, BURBANK, CA 91505 • TEL: 818.845.7366 • FAX: 818.845.7140

CIRCLE 61 ON FREE INFO CARD





# BE A RECORDING ENGINEER

★ TRAIN AT HOME ★

STUDIO CAREERS



Learn to become a professional recording engineer at home... at a fraction of the cost of most resident schools.

Easy Home-Study practical training in Multitrack Recording including the latest in Digital and MIDI.

Join the Audio Institute's successful working graduates or learn how to build your own studio. Career guidance.

Diploma. Job placement.

SEND FOR FREE INFORMATION

**Audio Institute of America**

2258-A Union Street, Suite AN

San Francisco, CA 94123

For A Sound Education™



CIRCLE 09 ON FREE INFO CARD

professional  
**Audio Supplies**  
immediate shipment



ask for our free PolyQuick catalog

Chicago  
(708) 390-7744 Fax: 390-9886

Los Angeles  
(818) 969-8555 Fax: 969-2267

**PolyQuick**

1243 Rand Road, Des Plaines IL 60016  
16018-C Adelante Str. Irwindale CA 91702

CIRCLE 53 ON FREE INFO CARD

66 OCTOBER EQ

## MIDI & THE PROJECT STUDIO NOW

value by turning a front-panel knob or perhaps pushing buttons. Fortunately, most signal processors will also let you control parameters remotely by sending them MIDI continuous controller commands over a MIDI cable.

Continuous controllers came about because synthesizers have pedals, knobs, levers, and other physical "controllers" that alter some aspect of a synth's sound. However, controllers have gone well beyond that. Recording engineers can choose from several "fader boxes" that resemble mini-mixing desks and emit a variety of MIDI signals, and of course, MIDI data can be entered into a sequencer and be edited in many different ways.

Like program changes, continuous controller messages are transmitted over a MIDI output and received by a MIDI input. At the transmitting end, the unit's computer usually digitizes the physical controller motion into 128 discrete values (0-127). As one example, consider a footpedal that generates continuous controller messages. Pulling the pedal all the way back typically generates a value of 0. Pushing down on the pedal increases the values until at midpoint, the pedal generates a value of 64. Continuing to push on the pedal until it reaches its maximum travel generates a value of 127.

MIDI "tags" each continuous controller message with an ID from 0 to

127. Don't confuse this with channel IDs; each channel can support up to 128 controllers, so a controller 7 message appearing over channel 2 is independent from a controller 7 message appearing over channel 3. Therefore, a signal processor with 128 different parameters could have each one assigned to a unique controller number (e.g., 1 for reverb first reflection time, 2 for reverb high-frequency decay, etc.).

When controlling a signal processor via continuous controllers, the basic idea is to assign a particular parameter to a continuous controller number. Then all you need is a control mechanism (such as a sequencer or pedal) that generates controller messages of the same number. For example, if a device's level parameter is assigned to controller 7 and your pedal can generate controller 7, hook the pedal's MIDI-out to the device's MIDI-in and your pedal will control volume (providing the channel assignment is correct). If you assign the chorus depth parameter to controller 12 and set the pedal to generate controller 12 data, the pedal will vary chorus depth.

With many signal processors, you can set different parameters to different controller numbers, or assign several parameters to the same controller number so that a single pedal motion could, for example, increase the level and reverberation time and boost the upper midrange.

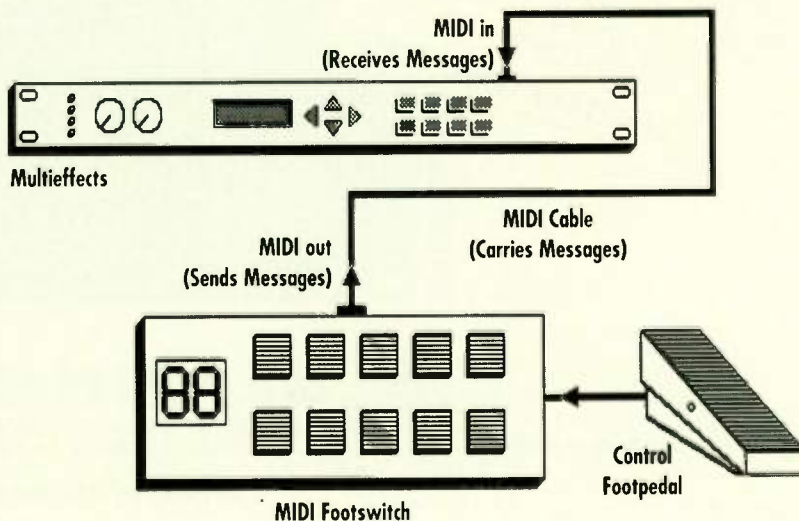


FIGURE 2: Scaling and inversion.



#### CONTROLLER ASSIGNMENT PROTOCOLS

Signal processors assign controller numbers to parameters in two main ways:

- **Per Program.** Each program has an assignable parameter (or group of parameters) that can be controlled by continuous controller messages. For example, controller 5 might vary chorus depth in one program or echo feedback in another. This is very convenient if it's difficult to set the transmitter's controller number.

- **Global.** With "global" controller assignments, each parameter (or at least most parameters) in the unit has a continuous controller number that is fixed, either at the factory or according to whatever assignment you give it. For instance, if echo feedback is assigned to controller 12, then every patch that uses echo feedback will have that parameter respond to controller 12 messages. This makes it necessary to select the desired controller number at the transmitter to accommodate the receiver, whereas with the per-program approach, it's more common to change the target controller number at the receiver.

#### HOW PROCESSORS HANDLE CONTROLLERS

There are several ways by which various units decide how continuous controllers will "take over" from a preprogrammed setting. One way of taking over is to add to (or subtract from) the programmed setting; usually inversion and scaling parameters will be available.

Scaling determines how far the parameter can vary from the programmed setting in response to a given amount of controller change. Inversion sets whether increasing controller values increases (+ scaling) or decreases (- scaling) the parameter value. Often these are combined into one number, such as +50 (which represents 50 percent scaling of full value in a positive direction), -37 (representing 37 percent scaling of full value in a negative direction), etc.

Figure 2 shows an example of a MIDI continuous controller signal scaled to +50 and -100. At +50, the continuous controller's maximum value is scaled by 50 percent. Therefore, increasing the controller value to maximum sends the programmed value 50 percent of the way to maximum. At -100, a

# SNOOZE YOU LOSE

Business, that is. Are you tired of waiting and waiting to get your cassettes or CD's ?

Have you heard every excuse in the book, and some new ones?

Is it frustrating to be at the mercy of a company that doesn't respect your deadline?

At QCA, we know that is a sure way to lose business, because so many of our clients

have come to us after being treated that way. We know only one way to work: quickly,

on your deadline, and at the highest level of quality. Call us and place an order today.



## 1-800-859-8401

QCA Inc. • 2832 Spring Grove Ave. Cincinnati Ohio 45225 • (513) 681-8400 Fax (513) 681-3777  
Manufacturers of Quality CD's, Cassettes & Records for over 40 Years

CIRCLE 55 ON FREE INFO CARD

## The accepted standard for audio amplification...

# BRISTON

## at the recognized leader for pro-audio products in the U.S.



**AudioTechniques**

1600 Broadway  
New York, NY 10019  
212-586-5989  
Fax 212-489-4936

CIRCLE 10 ON FREE INFO CARD



## MIDI & THE PROJECT STUDIO NOW

maximum continuous controller value sends the programmed value 100 percent of the way to minimum. Greater controller amplitudes increase or decrease the programmed parameter value, depending on whether the polarity is positive (+) or inverted (-).

If continuous controller messages don't seem to change a parameter, check the programmed value of the parameter being controlled. If its value is close to minimum or maximum, there won't be enough "headroom" for the controller to make much

difference, especially with scaling close to 100 percent.

Another option is to have the parameter follow the incoming controller value. A controller value of 0 would set the parameter to its minimum value, and 127 to its maximum. This works well with sequencers, where it's usually easy to adjust controller values. With footpedals, it's more of a problem since you might not always want the pedal to cover a parameter's maximum possible range.

Yet another method will not let

parameters respond to continuous controllers unless the controller passes through the preprogrammed value. When that happens, the parameter follows the controller messages. This is helpful when switching between programs where a footpedal is programmed to control different parameters. The parameter will stay as originally programmed until you start using the pedal and go past the existing setting.

Now that you know how to control your signal processors, next issue we'll investigate applications. **EQ**

## INVASION OF THE STRANGE PROGRAM CHANGE NUMBERINGS

MIDI allows for 128 program changes, but doesn't specify how these are to be numbered. Some manufacturers might number programs as 1-128, 0-127, or as banks (e.g., eight banks of 16 programs).

Suppose you program a MIDI footswitch to send out program change 15. Units that number programs from 0-127 will interpret this as 15, but if the program numbering scheme is 1-128, this will show up at the multieffects as program 16. Or you might even get something bizarre like Program 2-7 (bank 2, program 7) if the device has several banks of eight programs each.

It's worth running a test to see how your various effects respond, and making up a conversion chart that shows how program changes generated by your MIDI transmitter are interpreted by your various MIDI receivers.

—Craig Anderton

## THE MAGIC IS IN THE AIR



## EQ<sup>3</sup>™, THE ONLY AIR BAND EQUALIZER IN THE WORLD!

### T.V. & RADIO APPLICATIONS

"THE TONIGHT SHOW IS A 'LIVE MIX'. WE DON'T MULTI-TRACK AND RE-MIX FOR THE AIR. WHAT WE HAVE IS WHAT WE GET! THE AUDIO REQUIREMENTS ARE ALWAYS INCREASING — ARTISTS WANT THE SOUND QUALITY OF THEIR PERFORMANCE TO MATCH THEIR CD'S. THE EQ-3 LETS ME CREATE A SOUND FIELD THAT EASILY MATCHES, AND EVEN EXCEEDS ALL EXPECTATIONS. I HAVE GREAT CONTROL OF THE BOTTOM, WHILE THE 'AIR' CONTROL LETS ME ADD JUST THE RIGHT AMOUNT OF SIZZLE AND TOP. I CAN'T LIVE WITHOUT THE EQ-3 AND I BRING IT TO EVERY SESSION OR PRODUCTION I'M INVOLVED IN. THIS EQUALIZER BEATS THE OLD EQP-1A HANDS DOWN! THE EQ-3 MAKES BROADCAST AS IT SHOULD BE!"

BOB WHITLEY/AUDIO DIRECTOR/NBC/"THE TONIGHT SHOW"

"THE EQ-3 LIVED UP TO IT'S MONIKER OF 'HIGH DEFINITION AUDIO'. THE RESULTS ON THE HIGH END WERE ASTONISHING! WE TEAMED IT UP WITH OUR DIGITAL PROCESSOR TO CREATE A SUPERB, FULL, RICH SOUND FOR THE RADIO STATION. IT WOULD BE AN INVALUABLE ADDITION TO ANY BROADCAST FACILITY OR RECORDING STUDIO."

JIM MICKELSON/PROGRAM DIRECTOR/KKAT/SALT LAKE CITY



NIGHT TECHNOLOGIES INTERNATIONAL FOR MORE INFORMATION CALL 1-800-375-9289

### STUDIO APPLICATIONS

• EVER SINCE WE FIRST USED NTI EQ-3 FOR MIXDOWN ON THE INDIGO GIRLS "SWAMP OPHELIA" ALBUM, WE REFUSED TO MIX WITHOUT IT. THE WARMTH OF OUR CLASSIC NEVE/STUDER COMBINATION REACHES NEW HEIGHTS OF CLARITY WITH THE EQ-3 AS THE FINAL LINK IN THE CHAIN".

RICK MEYER/OWNER/JEFF TOMEI, CHIEF ENGINEER/TRICLOS STUDIO, ATLANTA

• "FINALLY A PROGRAM EQUALIZER THAT CAN ADD SPARKLE AND LUSTER WITHOUT ANY HARSH ARTIFACTS".

JOE GASTWIRT/PRESIDENT/OCEANVIEW DIGITAL MASTERING/LOS ANGELES, CA

### NEW ALBUM CREDITS

- BARBRA STREISAND
- A BRIDGE I DIDN'T BURN  
RICKEY VAN SHELTON
- THE WELL'S MCA R&B
- THIRD ROCK FROM THE SUN  
JOE DIFFIE

### NEW FILM CREDITS

- "LOVE & A .45"  
TRI-MARK
- "UNCONDITIONAL LOVE"  
PRODIGY FILMS
- "EVOLVER"  
TRI-MARK
- "MAVERICK"  
WARNER BROTHERS



# A ROOM AT THE TOP



To book time on the Euphonix  
at Record Plant contact  
Carol Davis (213) 993 9300

"Record Plant has always been on top with the latest technology and we are very proud to be the first to launch the new Euphonix CS2000M Music System. The Euphonix definitely represents a new generation of tracking & mixing systems. With facilities such as SnapShot Recall™ and Total Automation™ this new console offers engineers, producers and artists a level of creative freedom that other systems cannot provide."

"We spent a lot of time looking into this investment, checking out the sound of the Euphonix and its operational capabilities, and feel that it offers something new and exciting. Euphonix is the way to go if you want to stay ahead of the competition."

**Rick Stevens**, Record Plant  
Hollywood, California

 **Euphonix**

Digital Control Studio Systems

Sales & Marketing (818) 766-1666 Fax (818) 766-3401 Corporate Headquarters (415) 855-0400 Fax (415) 855-0410  
New York (212) 581-6242 Fax (212) 315-9552 Nashville (615) 327-2933 Fax (615) 327-3306 Europe (071) 602-4575 Fax (071) 603-6775

**CIRCLE 26 ON FREE INFO CARD**  
World Radio History



# MAKE WAY FOR SMDI

The perfect companion to MIDI, SMDI gives you the speed you need

BY DAVID MILES HUBER

WHERE WOULD we be if it weren't for data communication protocols — you know, those standards that allow one digital device to communicate with other similar (and not so similar) devices, hopefully with a minimum of muss and fuss? Imagine what a drag it'd be to transfer digital audio without the S/PDIF or AES/EBU standards (SCMS hell notwithstanding). Copying a DAT tape from one machine to another could end up being a major time nightmare. Similarly, without the MIDI 1.0 spec you might as well pack up the entire electronic music industry, Jack. Suffice it to say that these standards have been adopted to make our lives easier and to preserve our sanity.

The technical bliss of standard-

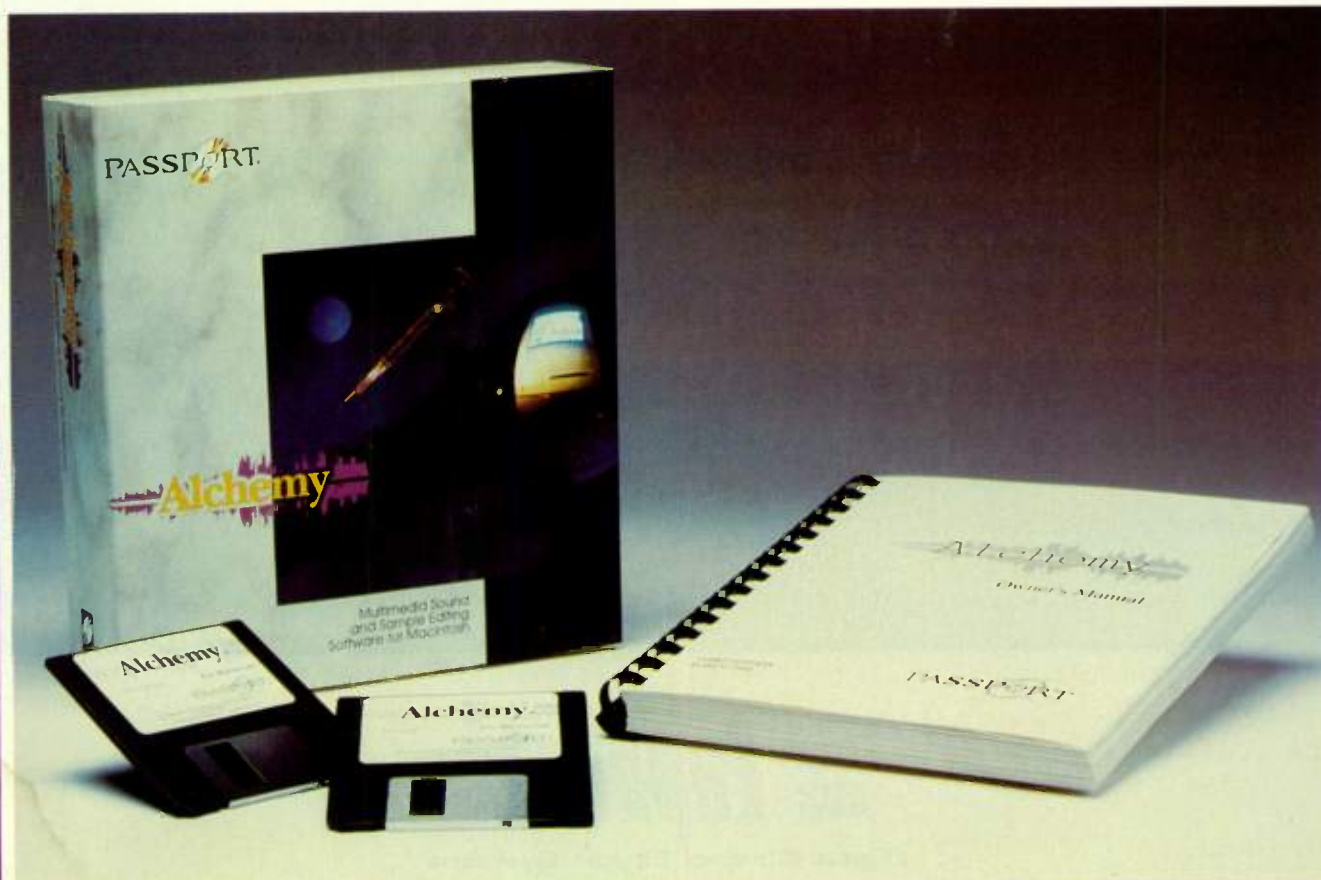
ized data communication begins to sour a bit, however, when the subject turns to the transmission of digital audio from one sampler to another. The MIDI Sample Dump Standard (SDS), in place for quite some time now, makes it possible for sounds to be digitally dumped from one sampler to another through MIDI lines. Unfortunately, this standard is excruciatingly slow. Plain and simple, MIDI was designed to be a real-time performance protocol, not as a medium for moving large quantities of dense, digital data.

To speed things up, companies borrowed from the computer field and began to design SCSI interfaces into many of their high-end samplers. This high-speed protocol can often

improve the transmission rate by a factor of more than 100 times. So what's the problem?

Although SCSI is great for transmitting large amounts of data at high speeds, the protocol isn't standardized and is often proprietary. That's right. If we try to dump data between samplers of different manufacture (or even model) using only a SCSI cable, chances are very high that nothing would happen.

Until recently, the only way that sounds could be moved between different samplers is through the use of a third-party sample editor. These software-based editors use a computer to edit, process, loop, and store sounds to disk. These sounds can then be imported and distributed (via



SCSI OUT, SMDI IN: Passport's Alchemy supports the SMDI protocol.



**We've Got  
Platinum...**

**We've Got  
Gold...**

**It's Time for...**



**Hafler** PROFESSIONAL

**9505 trans•nova**

There is always room at the top!  
Our Chief Engineer, Jim Strickland and staff have created the ultimate Studio Reference Balanced Power Amplifier. The Trans•nova 9505 utilizes Strickland's U.S. patent #4467288 J-Fet input/MOSFET output circuit to achieve unparalleled speed and accuracy. Trust your ears and enjoy the power, soundstage and exceptional image focus this ideal monitor amplifier provides. More excellence and creativity from Hafler, always  
**"The Standard."**

Backed  
by our  
world  
class



"I mixed my new album, 'Music From Here' on Hafler. It was an exhilarating experience! NO OTHER AMP COMES CLOSE!"

Ronnie Montrose  
Recording Artist/  
Producer



"IT'S RIDICULOUS! Excellent bass control, great harmonic detail, the 9505 Trans•nova is another level up in overall performance."

Tom Jung  
DMP Records



"The new Hafler Trans•nova sounds great here at Capitol's Tower Mastering. Dependable as always - clear and detailed with wonderful bass response."

Wally Traugott  
Tower Mastering  
Capitol Records



"The first 20 Trans•nova 9505's ever produced are now in use at Warner Bros. Studios Facilities in Burbank, CA."

Claus Wiedemann  
Chief Engineer



# THE PROJECT STUDIO EXPERTS

**CALL TODAY FOR A  
FREE CONSULTATION  
203.442.9600**

**CARUSO  
MUSIC**

*all major brands • sales & service*

**20 Bank Street  
New London, CT 06320  
203.442.9600  
203.442.0463 (FAX)**

**CIRCLE 14 ON FREE INFO CARD**

## STOP WASTING TIME & MONEY

**LOWEST PRICES-  
GUARANTEED!!!!**

**All products are professional  
quality and are backed by  
100% Money Back Guarantee.**

**WE BEAT ANY PRICE!**

- 10 pieces to 1000 pieces
- **DAT** Tape, all lengths
- 4mm DDD-MRS and 8mm Data Grade
- CD-R's 18, 63, 74 minutes non-logo
- Chrome audio cassettes all lengths
- 3.5" & 5.25" Magneto Optical Disks
- All products are available in bulk, wrapped and include labels and inserts.
- All orders shipped same day.
- All major credit cards accepted.

Call today  
**1-800-522-2732**

**APDC**  
Englewood Cliffs, NJ

**CIRCLE 20 ON FREE INFO CARD**

## MIDI & THE PROJECT STUDIO NOW

SCSI) to a number of supported samplers through device-specific drivers. But what if you don't have a computer or a sample editor handy? What if a driver for your whiz-bang sampler doesn't exist, or you're on stage and don't have the time to transfer the dumps? You'd simply be stuck because a standard protocol for transmitting digital audio data through SCSI hasn't been developed — until now, that is! Finally, a candidate that goes by the name of SMDI (pronounced "Smi-dee") has stepped up to the batter's box with the hope of becoming the first sample dump SCSI protocol.

### SMDI TO THE RESCUE!

SMDI (an acronym for SCSI Musical Data Interchange) was developed by Matt Issacson for Peavey Electronics as a non-device specific format for transferring digitally sampled audio between SCSI-equipped samplers and computers at speeds up to 300 times faster than MIDI's transmission rate of 31.25 k per second. This means that all you'd need to do to transfer digital audio directly from

one supporting sampler to any other device is to connect the SMDI ports (via a standard SCSI cable). It's just that simple.

Although SMDI is loosely based upon MIDI SDS, it has more advantages over its slower cousin than just speed. For example, it can distribute stereo or multichannel samplefiles, it isn't limited to files that are less than two megawords in length, and it can transmit associated file info (such as filename, pitch values and sample number range). Sound patch and device-specific setup parameters can also be transmitted and received over SMDI lines through the use of standard system exclusive (sys-ex) messages.

SMDI is not, however, designed to replace MIDI. Although MIDI isn't the fastest at shuffling samples around, it is still the best way for communicating real-time performance and control data. Therefore, SMDI can simply be thought of as a fast sidechain for distributing samples and sys-ex data.

In the applied real world, SMDI could let you save all your samples to

### THE POLITICS OF SMDI

SMDI's universal adoption for samplers and synths would be a boon to users, but there's more than one side to this story. Developers of sample editing software would benefit greatly from SMDI; they'd need to write only one software driver for all samplers and synths. (Currently, it's necessary to create individual drivers for all the proprietary sample transfer methods used in the industry.) Complexity of support has been cited by Passport as a contributing reason for dropping Alchemy, and also by Digidesign for orienting Sound Tools more toward hard-disk audio.

Sampler manufacturers are in a different situation. Clearly, SMDI would be of tremendous benefit to professionals who want to back up their work or transfer an older sample library to a newer sampler. But some companies spend a small fortune developing sample libraries for their machines, and they fear the following scenario:

1. Company A comes up with a hot new SMDI sampler and spends *beau-coup* bucks developing cool sounds for it.
2. Company B comes up with a hot new SMDI sampler, and can sell it for less because the company didn't develop any decent sounds (except piano and strings, in order to fool people auditioning keyboards at music stores).
3. Consumer C buys Sampler B and, thanks to SMDI, transfers all the cool samples from a friend's Sampler A.

Whether SMDI's acceptance continues its momentum or stalls depends not only on pressure from software companies, but on whether consumers will respect the copyrighted nature of sounds and other intellectual property. SMDI is something the industry really needs; let's hope its power isn't abused by the people it was ultimately designed to benefit.

—Craig Anderton



# TO MAKE A GREAT RECORD, YOU NEED A GREAT CONSOLE.

For years, we've designed and built boards for some of the world's most influential musicians and producers. And while they may be drawn to Soundtracs based on smart features, logical design and high quality, the reason they choose our consoles is *sound*. From our top-end Jade production console to the new Topaz 24.

A versatile dual-input inline design with either 24 or 32 channels, Topaz is immediately distinguished by our noticeably warmer and smoother EQ (full 4-band with dual swept mids) coupled with exceptional trans-

parency throughout. You can actually *bear* the difference a Topaz can make on your recordings — something you can't do with other consoles.

We also included features of critical importance when it comes to focusing on what truly matters in recording and mixdown. Dedicated EQ on all tape returns without compromising your primary equalization. SOLO and MUTE functions on all tape and

monitor inputs to let you cut through the mix and isolate problems quickly and easily.

Our unique "floating bus" design allows you to route the 8 group outputs to all 24 or 32 inputs of your tape machine(s) without any prepatching. An optional meter bridge keeps track of your input signal.

And when it's time to automate, you've got the option of Soundtracs' proprietary high-resolution VCA/Mute automation, already proven in our large consoles.

So if making great records is part of your future, *listen* to Topaz. You'll hear why we've developed such a track record



for making great consoles.

For an exhaustively detailed and lavishly illustrated 8-page, full-color brochure with every single detail about the remarkable new Topaz, please CALL (516) 932-3810, FAX (516) 932-3815 or WRITE Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068.

**TOPAZ**  
**SOUNDTRACS**  
Surbiton, Surrey, England  
©1991 SAMSON

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

World Radio History





#### SMDI SAMPLER: Kurzweil's K2000

disk (possibly within a single database) and then quickly distribute these sounds to any supporting sampler. Sample editors wouldn't really require that your computer have an internal DSP sound card because edited samples could be quickly shuffled to and from your sampler for auditioning. Inexpensive sample players could have easy access to tons of samples, and sample dumps from a central library could be managed much more easily during a live performance.

As of this writing, the following products have implemented the SMDI protocol into their systems:

- Turtle Beach SampleVision (PC sample editor)
- Opcode MAX (Mac music programming construction kit)
- Passport Alchemy (Mac sample editor)
- Dissident MIDI Sample Wrench (Amiga sample editor)
- Dissident disSX (Amiga control program for Peavey SX)
- Kurzweil K2000 and K2000R (sample players)
- Peavey DPM-SX/SXII (sampling modules)
- Peavey DPM-SP (sample player)

Since this generic SCSI-based transfer protocol has been released to the industry in the form of a proposed public-domain standard without any associated fees or royalties, I for one would love to see more companies adopt this powerful standard as a tool for making our work-a-day lives easier. If you agree, the best way to make your voice heard is to call or write your favorite manufacturer and let them know how you feel about SMDI. A copy of the SMDI document "SMDIPROT" can be obtained at no charge by contacting Peavey Electronics (Customer Service: 601-483-5365).

## M-1

### MICROPHONE PREAMPLIFIER



"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.

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

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



**THE JOHN HARDY COMPANY**

P.O. Box AA631  
Evanston, IL 60204

Phone: (708) 864-8060

Fax: (708) 864-8076



# THE BEST MUSIC EQUIPMENT CATALOG IN THE BUSINESS

# FREE

**MUSICIAN'S FRIEND GIVES YOU...**

## GREAT VALUE, SERVICE AND SELECTION

- 45-day money-back guarantee
- Toll-free ordering
- Full technical support and customer service
- Extra fast delivery
- Customer satisfaction
- Immediate up-to-the-minute inventory and price information
- Major credit cards accepted



## FULL COLOR CATALOG FEATURING...

- Detailed product descriptions
- In-depth reviews of new products
- Informative product articles
- A huge selection of quality brand name equipment including guitars, basses, amps, keyboards & MIDI, software, effects processors, recording equipment, PA gear, books, videos and tons more...

**Zoom ART DigiTech Ibanez**

**Marshall Roland BOSS**

**E-MU DIMARZIO Seymour Duncan FURMAN**

**Lexicon SAMSON NADY ESP**

**Jackson Gibson Charvel DOD**

**WASHBURN KORG EV Epiphone**

**Fostex ADA TASCAM**



For all of your  
music equipment needs  
call **1-503-772-5173**  
and ask for your **FREE** Catalog

### OUR PLEDGE

*The best values, shipped  
to your door*

☐ **YES!** Please rush me the next  
3 editions of Musician's Friend  
totally **FREE** of charge!

Now's your chance to join hundreds of thousands of satisfied  
musicians in receiving the #1 catalog, absolutely free!

Call **503 772-5173**, or mail in this coupon to Musician's Friend,  
P.O. Box 4520, Dept. 114, Medford, OR 97501.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

CIRCLE 35 ON FREE INFO CARD



# MAKING MIDI CABLES

Custom-made cables give you length and quality at a price you'll like

BY CRAIG ANDERTON

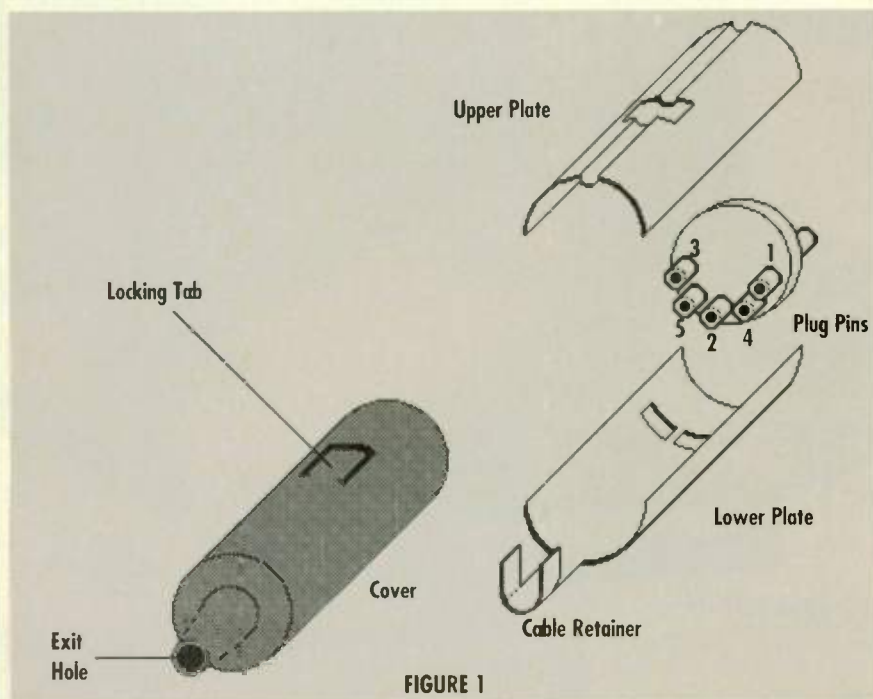


FIGURE 1

THERE ARE some compelling reasons to make your own MIDI cables:

- You can use really heavy-duty wire and plugs, if you crave reliability.
- Homemade cables are easier to

repair than ones with molded plastic plugs.

- You can make custom-length cables, which can lead to a neater setup.

• You'll save money, as compared with the cost of commercially available cables.

Making MIDI cables is not as easy as making many other types of cables, because the connectors themselves are fairly small. But once you get the technique down pat you can turn out a well-functioning, well-built cable in a few minutes.

The right kind of soldering iron is crucial: you need a very fine point and thin solder in order to avoid overheating and oversoldering the cable. Similarly, wire strippers and pliers should be designed for fine work.

## CONSTRUCTION

Figure 1 shows an exploded view of a typical MIDI plug (note the unusual, out-of-sequence pin-numbering scheme for the plug pins). The only pins needed for MIDI are 4, 2, and 5; the rest are unused. Make sure you solder to the part of the plug pins designed to be soldered to, not the part that plugs into a MIDI jack.

MIDI cables require two-conductor, shielded cable. The MIDI spec recommends twisted pair wire for the two inner conductors, but the type of cable used for XLR connectors works just fine.

First, prepare the ends of the shielded cable so that you end up with three stripped and tinned leads. The shield connects to pin 2, and the two other leads connect to pins 4 and 5. With most wire, these leads will be different colors (such as white and black) so you can easily remember which one went to pin 5 and which went to pin 4.

There are two main types of shield: spiral wrap, and braided. Spiral wrap is the easiest to use; fig. 2 shows the basic process of preparing a spiral wrap cable. (A) shows the outer insulation stripped off to expose the shield and the two inner conductors. In (B), the shield has been unwrapped to expose the two inner conductors. (C) shows properly prepared cable. The

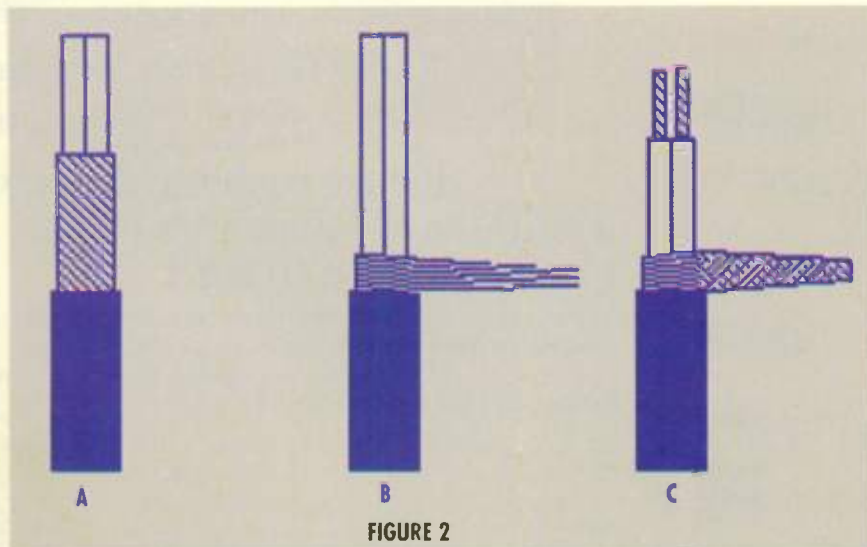


FIGURE 2



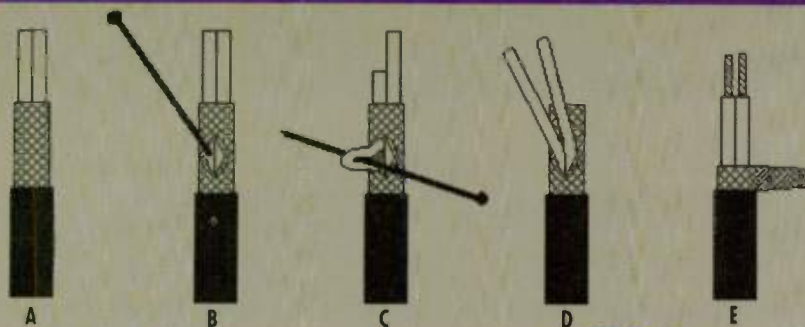


FIGURE 3

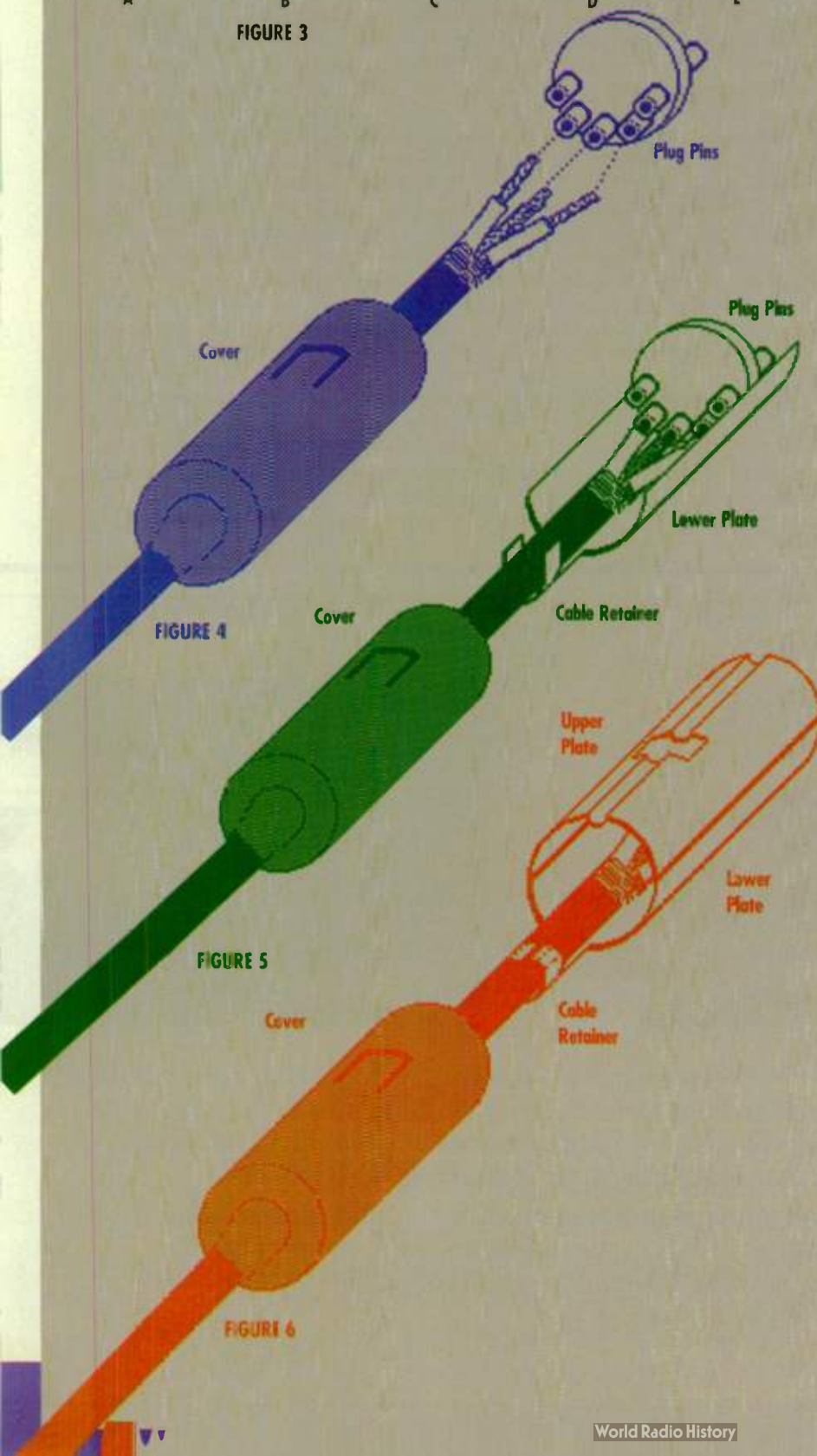


FIGURE 4

FIGURE 5

FIGURE 6

# WHAT DO AEROSMITH, GARTH BROOKS, & U2 HAVE IN COMMON?

Someone Had To Record Them.

It might as well be you. Right now there are thousands of good paying jobs in the music industry for quality audio engineers and assistants. But no one can just walk into a major recording studio and ask for a job. The audio recording industry demands specialists. Call us today at **1-800-562-6383** to find out how, in just a matter of months, we can give you the training you'll need to get that exciting first job. Call today.

CONSERVATORY  
Recording  
Arts & Sciences

1110 East Missouri, Suite 530  
Phoenix, Arizona 85014

**1 800 562-6383**

CIRCLE 16 ON FREE INFO CARD



## LEARN THE ART OF RECORDING

You can get the practical, real-world skills needed to successfully start your career as a recording engineer, producer or studio musician. • Hands-on approach, learning by doing • Previous experience not required • Complete 300 hours of training in less than 2 months • 6 studios filled with the latest equipment • Small classes, excellent personal attention • Job placement assistance • Financial aid available • Low cost, on-campus housing

For free brochure, call or write today  
**1-800-848-9900 1-614-663-2544**



**THE RECORDING  
WORKSHOP**

455-Q Massieville Rd  
Chillicothe, Ohio 45601

Cable State Board of Proprietary School Registration #90-07-0498T

CIRCLE 74 ON FREE INFO CARD



## MIDI & THE PROJECT STUDIO NOW

shield has been twisted together and tinned, and about 1/8-inch of insulation has been stripped off the ends of the inner conductors.

When twisting the shield wires together, do not twist them too tightly around the inner conductors; later, when you solder to the shield, the heat could cause it to melt through the inner conductor insulation and create a short circuit. However, the end of the shield should be twisted tightly so that the resulting lead isn't too thick. With some wire, you may even need to cut off some of the shield wires so that the shield lead is thin enough to solder to the plug pins.

Also note that in (C), you'll probably want all the leads to be somewhat shorter than shown in the diagram, where they are a bit longer for the sake of clarity.

Braided shielding is much harder to work with, but can hold its shape better if the cable is subject to a lot of bending. Consider using spiral wrap cable for permanent installations such as patchbays, and braided cable for on-stage use.

Figure 3 shows one way to prepare braided cable. As with spiral wrap, (A) shows the outer insulation stripped off to expose the shield and the two inner conductors. (B) shows using a pin to separate the braid. Poke the pin in between a space in the mesh, and gently push the mesh apart to create a small opening. Once you've created an opening, again use the pin (or a very small pliers) to pull the inner conductors out and through the opening, as shown in (C). (D) shows both leads pulled through the shield. Now twist the shield together and tin the end, following the same cautions mentioned above for spiral wrap. (E) shows the final result—a tinned shield and the two inner conductors with about 1/8-inch of insulation stripped off the ends. As with the spiral wrap example, you may want the leads to be somewhat shorter than shown.

This is not the only way to deal with braided shields. Some people laboriously unbraid it, then twist the wires together; others tear at the

shield until they get a lead out of it. Whatever works...

Returning to the MIDI plug, gather the plug pins and cover. Slip the cover over the wire before proceeding (fig. 4) so you don't forget to do this. Figure 4 also shows how the cable is going to connect to the plug pins—the inner conductor leads go to pins 4 and 5, and the shield goes to pin 2.

Now hold the plug pins part in a vise and solder the leads to the appropriate pins (fig. 5). It may help to tin the pins first, but if the pin has a hollow section, you're probably best off inserting the lead into the hollow section, heating the pin, and then letting solder flow into the hollow section through capillary action. Take a while to let things cool off between soldering different pins; you don't want to melt the plastic part holding the pins. Then attach the plug pins to the lower plate (a ridge on the plug pins should correspond to a groove in that plate). Make sure the cable sits in the cable retainer section as shown.

Now crimp the cable retainer (fig.

# You're a Musician. Your Language is Music and BBE is Your Essential New Tool!

You speak through your instruments and your songs. No ordinary words can convey all the complexities, the joy, the pain, the ideals and the dreams. Only your music can do that. But how does the music you hear in your head fight its way through a morass of electronics to reach the ears of your audience without losing some of your meaning? **BBE IS THE ANSWER!**

BBE is your indispensable companion in the recording studio, the club and concert stage. BBE reveals the richness of your texture, the nuances, the subtleties, the inner meanings in your music. Your artistic presence is more vivid—the colors in your sound more vibrant. The crystalline clarity of your music is triumphantly unveiled!





6). Use a pliers to bend over each lip until it wraps securely around the cable. The object is to have things such that if you pull on the cable, it takes the plug along with it instead of ripping the leads out of the pin plugs. However, you don't want to crimp so tightly that the lip cuts into the insulation and causes a short circuit.

Now put on the upper plate. The next step is to slide the cover over the upper/lower plate combination. Note the rectangular cutout in the upper plate and the matching rectangular flap in the cover; the cover should fit over the upper plate so that the flap catches in the cutout, securing the cover in place.

We're now halfway toward our goal: a MIDI plug connects to one end of the cable. Fig. 7 shows a completed cable plug as viewed from the front of the plug (i.e., from the part that plugs into a MIDI jack). All that remains is to connect a plug to the other end, and we have a cable. Just make sure that the leads connecting to pins 4 and 5 on one plug connect to like-numbered pins on the other plug.

FIGURE 7

## PARTS LIST

Plugs: 5-pin, 180-degree DIN plugs  
(Radio Shack #274-003)

Wire: 2-conductor (twisted pair preferred), shielded cable  
(#278-1281)

Misc.: Solder, patience, small fingers, proper tools

## TROUBLESHOOTING

The main place to check for problems with a MIDI cable are:

- Shorts between the pins.
- A renegade shield lead that shorts out to either pin 4 or 5 (or both, if you're really sloppy).
- Reversed pins 4 and 5 at a plug (i.e., the lead that connects to pin 4 at one plug connects to pin 5 at the other plug).
- Overheating that has melted the insulation, leading to a short circuit.
- Insufficient solder at a pin, lead-

ing to a weak connection.

- A cable retainer that has cut into the cable.

In extreme cases, you may need to desolder all the connections and start all over again. If that happens, restrip the shielded cable — don't try to salvage it.

In any event, making your own cables is worth the effort. Just about all the cables in my studio are homemade; they're not only reliable, they're always the right length...and when I need a new cord, I just run into the lab for a few minutes. **EQ**



*"Increases intelligibility, restores harmonics, and improves clarity... recaptures the natural sparkle and punch..."*

Mix Magazine

## Wherever There is Music and Sound, BBE Plays A Vital Role:

**Electric and Acoustic Guitars** have sparkle, clarity, and definition. BBE brings out the harmonic complexity and bite—significantly increases cutting power.

**Keyboards & Synthesizers** take on a new realism. Percussive and plucked sounds are uncannily clean and sharp. Chords are rich and fully-textured, each note in the chord retaining its integrity.

**Vocalists and Soloists** BBE is for everyone using microphones—singers, saxes, horns, flutes, whatever. You'll hear all the texture of the sound, all the rich harmonic structure, all the essence of your music.

**Recording Studios** home and professional. On individual tracks, multitrack down to two track, cassette duplication and mastering, BBE brings out the full spectrum of sound and gives a superb, professional result.

**Percussion** The snap of the drums, the ping and sizzle of the cymbals never sounded so real as with BBE.

**Stage and Club Sound** systems are wondrously improved with BBE. Discos leap into life. The vitality, presence, texture and realism of the performance shines through.

**Radio and TV stations** all over the world are broadcasting with BBE for richer, fuller, cleaner sound and a presence that commands and holds the audience.

# BBE®

## "All The Sound You've Never Heard"

5381 Production Drive • Huntington Beach, CA 92649 • 714-897-6766 • FAX: 714-896-0736  
Made in USA



# MIDI BUYER'S GUIDE

A selective sampling of some of the hot MIDI tools currently available

## MIDI AUTOMATED RECORDING CONSOLES

Brand	Model	Product Description	Price	Info
Alesis	X-2	In-line recording console with MIDI mute automation.	\$7999	126
Allen & Heath	GS3V	In-line recording console with MIDI mute and VCA fader automation.	\$8995	127
CAD	CAD Maxcon	Modular, configurable mixing console with MIDI addressable automation.	*	128
Fostex	812	Twelve channel in-line recording console with optional MIDI muting.	\$2644	129
Mackie Designs	CR-1604	Sixteen channel console with optional MIDI muting and VCA fader automation package.	\$1099	130
Soundtracs	Topaz	In-line recording console with MIDI mute and VCA fader automation. (Price reflects 32 channels)	\$4995	131
Soundcraft	Spirit Auto	In-line recording console with MIDI control over muting and VCA faders. (Price reflects 24 channels)	\$8995	132
Studiomaster	P7	In-line recording console with MIDI mute automation.	\$4195	133
Tascam	2524	In-line recording console with MIDI mute automation.	\$4399	134
Yamaha	ProMix 01	Sixteen channel mixer with snapshot and dynamic automation and 50 MIDI addressable mixing "scenes."	< \$2000	135

## SMPTE-TO-MIDI INTERFACES

Brand	Model	Product Description	Price	Info
Key Electronics	MP128S	2x8 MIDI interface with bidirectional SMPTE port for PC compatibles.	\$300	136
MOTU	MIDI Time Piece II	Rack-mount, 8x8 MIDI-SMPTE interface available in configuration for Mac or PC. (add \$100 for PC)	\$595	137
MIDIMAN	Mac Syncman	Rack-mount 2x6 MIDI interface with SMPTE for Macintosh computers.	\$280	138
Music Quest	MIDI Engine 2Port/SE	Professional MIDI interface with SMPTE sync for IBM compatibles.	\$200	139
Opcode	Studio 5	240 channel, 15x15 MIDI interface with SMPTE synchronizer and patch bay capabilities.	\$1195	140

## MIDI AUTOMATION CONTROLLERS

Brand	Model	Product Description	Price	Info
CM AUTOMation	FX-100	MIDI controller with eight 100 mm faders and LED's for mute, solo and nulling status.	\$399	141
Digital Music	Ground Control	Programmable MIDI foot controller offers the ability to access up to 8 different effect devices.	\$279	142
Fostex	Mixtab	User interface for the DCM-100 mixer that provides MIDI control over mixer parameters.	\$629	143
JLCooper	FaderMaster ProI	MIDI controller with 8 faders, 20 programmable banks, 50 factory presets and two MIDI inputs.	\$549	144
Niche	AS	MIDI fader control module designed for use with the Niche ACM interface.	\$699	145
Penny And Giles	MM16	MIDI controller that provides two independent MIDI outputs, 16 control "belts," and a five button "transport."	\$2500	146

## SOFTWARE

Brand	Model	Product Description	Price	Info
CM AUTOMation	MIDIcam 2.0	Macintosh application dedicated to the control and interface of CM AUTOMation systems.	\$399	147
Level Control Sys	Cue Control 2.3	Cue-oriented automation program suitable for live sound reinforcement or postproduction mixing.	\$1100	148
Opcode	MAX	Graphic development environment used to write programs capable of controlling any MIDI compatible device.	\$395	149
Passport	Master Tracks Pro 5	MIDI sequencing program supporting 64 tracks of dynamic fader automation.	\$300	150
RZ Cybernetics	H3000 Editor	Macintosh editing program for all models of the Eventide H3000 and the H3500.	\$175	151
Steinberg Jones	Cubase Score	MIDI sequencing application for Atari featuring MMC and simultaneous use of eight dynamic MIDI mixers.	\$549	152
Twelve Tone Sys	Cakewalk ProI 3.0	MIDI sequencer for Windows with 256 tracks, MMC, 96 assignable faders and support of the CR-1604.	\$349	153

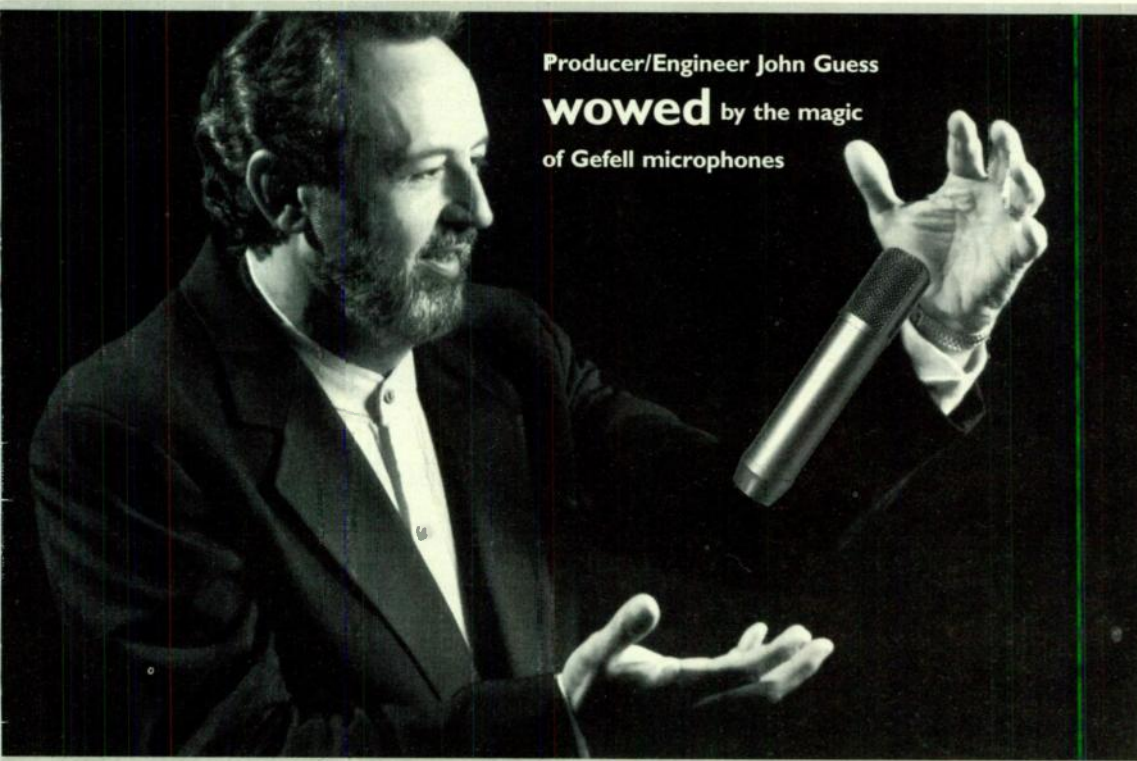
## AUTOMATED HARDWARE INTERFACES

Brand	Model	Product Description	Price	Info
CM AUTOMation	MX-28	MIDI controlled stereo mixer with eight mono inputs, direct outputs for each input, & balanced stereo outputs.	\$699	154
CAD	MegaMix	MIDI controllable hardware/software package providing onboard or outboard console automation.	\$1995+	155
Fostex	DCM-100	A MIDI controlled mixer with 8 stereo inputs, 2 effect sends, 2 stereo returns and 100 snapshot memory settings.	\$919	156
JLCooper	MixMaster	MIDI controlled 8 channel VCA mixer, compatible with Performer, Vision, Cakewalk, Notator Logic and Cubase.	\$499	157
Mackie Designs	OTTO 1604	Automation upgrade for the CR-1604 console which offers MIDI muting and real-time fader automation.	\$849	158
MOTU	MIDI Mixer 7	MIDI controlled, rackmount mixer with 7 stereo inputs and 1 auxiliary input.	\$595	159
Niche	ACM	MIDI controllable automation module with eight channels of non-VCA automation.	\$499	160

\* Price varies with configuration



# Why do they call it Gefell?



**The only  
microphones  
in the world  
made with  
the legendary  
M-7 capsule**

For decades the ultimate quality standard for studio microphones was embodied in the name of one man—Georg Neumann. Then the company that bore his name was bought by a multinational firm that changed the production methods. Would that unique sound be lost forever? Yes, but...

Magically, in a remote village in the former East Germany, G Prime discovered that the manufacturer of these extraordinary mikes had been divided after World War II. The originator continues to hand-build the same pristine designs to the same microscopic tolerances, incorporating them into current models, and branding them with the name that was once hidden behind the Iron Curtain: **Microtech Gefell**.

**G** P R I M E

TEL 212 765-3415 FAX 212 581-8938

**CIRCLE 37 ON FREE INFO CARD**



## MIDI & THE PROJECT STUDIO NOW

### MIDI COMPATIBLE EFFECT DEVICES

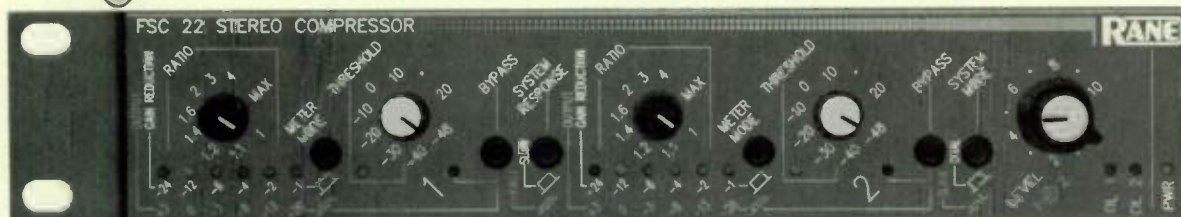
Brand	Model	Product Description	Price	Info
Alesis	MidiVerb 4	True dual-channel effect processor with 18-bit AD/DA converters and real time modulation of effect parameters via MIDI.	\$399	161
ART	RXR Elite	Fully programmable 16 bit reverb processor with MIDI programmability and control of effect parameters.	\$349	162
DigiTech	TSR-12	Multi-effect signal processor with continuous MIDI control of effect parameters.	\$500	163
Ensoniq	DP/4	Digital effects processor with real-time modulation of any parameter via MIDI.	\$1495	164
Eventide	H3000-D/SX	Ultra-Harmonizer effects processor with MIDI addressable programming and parameter adjustment.	\$1995	165
Klark Teknik	DN3600A	Digitally controlled, 1/3-octave equalizer with full control of program change and equalization parameters.	\$3250	166
Lexicon	Jam Man	MIDI synchronizable digital delay unit with up to 32 seconds of memory.	\$459	167
Peavey	Autograph II	MIDI addressable one-third octave, 28 band graphic EQ with built-in real time spectrum analyzer.	\$500	168
Rane	MPE 28	Programmable 1/3-octave equalizer with 128 memory locations and full MIDI implementation.	\$749	169
Roland	R-880	Digital reverb and effects system which offers complete MIDI control of program changes, effect parameters and algorithm editing.	\$3995	170
RSP Tech	Intelliverb	Digital reverb processor with MIDI control over program change & up to eight real time effect parameters.	\$1299	171
Sony	HR-MP5	Digital multi-effects processor with 18 bit conversion. Up to four MIDI controllers can be used simultaneously for real-time control over effect parameters.	\$695	172
Symetrix	Digital Voice Proc 601	Rackmount processor providing MIDI control over parametric EQ, dynamics processing and digital delay effects.	\$1995	173
tc electronic	M5000	Modular digital processor with continuous MIDI of all program parameters.		174
Yamaha	DS000	Digital delay unit with 20 bit AD/DA conversion and MIDI control of parameters and program selection.	\$1499	175

### MISC. HARDWARE DEVICES

Brand	Model	Product Description	Price	Info
MIDI Solutions	Footswitch Controller	A MIDI-to-switch interface which can be programmed to send out virtually any MIDI command upon the release or depression of a footswitch.	\$79	176
Vestax	HDR-6	Hard disk recorder with built-in digital mixer. All mixer parameters are assignable to MIDI control.	\$2300	177

\*Price varies with configuration

# COMPRESSED COMPRESSOR



**HR**  
HALFRACK  
FORMAT  
HORIZONTAL  
OR VERTICAL  
19" RACK  
MOUNT

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

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

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

**FSC 22**

STEREO COMPRESSOR / LIMITER

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





# DREAM TO REALITY WITH ADVANCED TECHNOLOGY



On The Right Track



**We think the digital recorder should be fully digitalized.  
Here is the answer from Vestax.**

**V**estax is proud to announce a new line of fully digital multitrack recorders. The HDR-6 and HDR-4 are designed for professional quality recording and utilize some of the most advanced digital technology available.

It's a simple operation to record your audio signal onto the internal hard disk of the HDR series recorders. Once the hard disk is full, all the data can be backed up onto DAT or any other digital storage media. The data is stored as individual tracks and can be loaded back to the hard disk so you can come back later and continue working on each track separately. Extra space for an additional hard disk is provided so you can extend the recording time.

The HDR series recorders come with a digital mixer built in so you can merge and track digitally without any A/D or D/A conversion. The master stereo signal can be recorded direct to DAT or any other digital mastering deck. The digital mixer on the HDR-6 features a 3-band digital EQ with sweepable mid-frequency and 4 Aux sends and 4 stereo returns, while the HDR-4 has the same EQ section with 2 Aux sends and 2 stereo returns. All the parameters of the digital mixer are displayed on the bargraph meter and the counter and can be adjusted by using the jog wheel. MIDI in, out and through are built in for MIDI synchronization and all the mixer parameters can be assigned to MIDI so they can be controlled by an external mixer or set up for automation.

Edit functions including move, copy and delete allow for song editing from track to track. Auto punch in/out as well as 99 auto locations are also featured to further ease editing. The HDR Series can be synchronized with a simple connection, allowing you to sync with an unlimited number of HDR recorders. With this connection, a digital master signal is sent to the other units so they can be mixed together digitally. MIDI or unit synchronization does not occupy any tracks, so they don't take up your valuable recording space. The HDR series recorders are available with SMPTE, SCSI or AES/EBU interfaces.



**HDR-6**  
Digital 6 Track Recorder



**HDR-4**  
Digital 4 Track Recorder

**Vestax Musical Electronics Corp.**

2860 Cordelia Rd. Ste. 120  
Fairfield, CA 94585  
Phone: 707-427-1920 Fax: 707-427-2023

**CIRCLE 86 ON FREE INFO CARD**



# Once you hear how **SUPERIOR** our new powered mixers are, you won't mind **PAYING LESS** for them.

Need to run a large PA with eight speaker systems? Need to run a PA and a monitor system? ...No Problem! The six new MetroMix powered mixers from SoundTech are designed to eliminate all the excuses you get from other power mixers. No compromises with MetroMix's massive power and total flexibility. You can handle any sound reinforcement job from simple to sophisticated.

Single graphic EQ/power amp and dual graphic EQ/power amp versions are available.

That's right! Dual power models have two independent graphic EQ's and power amp sections.

new  
**MetroMix**

This means a dual powered version will power up to eight PA speakers or four PA and four stage monitor speakers.

Ready to rack mount for professional applications or you can get an optional "top box" to carry it around.

Three band EQ provides you with absolute tonal flexibility.

Three aux busses (1 pre, 2 post) plus built-in reverb give you the most versatility in tackling monitor or effects needs.

Balanced mic and unbalanced line inputs on every channel.

Six models have up to 650 Watts RMS total power. All units can handle 2 Ohm loads.

Connector panel can be moved to the back of the unit. No more "rat's nest" of cable to trip over on stage. Great for rack users or permanent installations.

Phantom power for condenser microphones on every Mic input.

Built in compressor eliminates amplifier distortion, even at very loud levels.

Tape to Monitor control lets you route the recorded music directly to the stage monitors. Great for sing along Karaoke gigs where shy, aspiring singers need to hear the music loud in the monitors.

For the location of a stocking SoundTech dealer near you...  
Call  
1-800-US-SOUND,  
ext. 131 / 132

All these features and power are backed up by the SoundTech 3 year warranty. Check out all six versions of the new Metro Mix powered mixers at your local SoundTech dealer today.



**SoundTech™**  
PROFESSIONAL AUDIO  
255 Corporate Woods Parkway  
Vernon Hills, IL 60061-3109 USA (708) 913-5511

CIRCLE 64 ON FREE INFO CARD





*SPEAKER RECONING — PAGE 90*

LIVE SOUND FOR THE GIGGING MUSICIAN

## THEY CALL HIM BRUCE

BRUCE JACKSON has been building his heavyweight status in the audio industry since 1967, when he started the company JANDS. Based in Australia, JANDS provided touring bands with sound and lighting design at a time when the touring sound industry barely existed. Several years later Jackson sold JANDS to join Clair Brothers Audio, where he would go on to mix live sound for the likes of Elvis Presley, Bruce Springsteen, and Fleetwood Mac.

In 1986, Jackson formed Apogee Electronics Corpora-

tion, which began manufacturing high-quality filters for digital audio recorders and has since developed the UV 22 CD encoding process. Selected by virtually every major mastering facility, Apogee's UV 22 process is now widely being used for placing high resolution audio onto the standard compact disc format. Most recently, Apogee has introduced a reference-quality DAT tape, the shell of which is the subject of 15 patents. Although Bruce had been retired from the live-sound



**APOGEE INNOVATOR BRUCE JACKSON TALKS TO *EQ* ABOUT THE COMPANIES HE'S CREATED AND ABOUT BEING STREISAND'S RIGHT-HAND SOUNDMAN**

**BY STEVE LA CERRA**

The advertisement features the word 'Community' in a large, bold, yellow, sans-serif font, repeated twice. The background is black and filled with various white line drawings of audio equipment, including speakers, amplifiers, and mixers. At the bottom, the phrase 'THE • ART • OF • PURE • SOUND' is written in a white, sans-serif font, with dots separating the words.



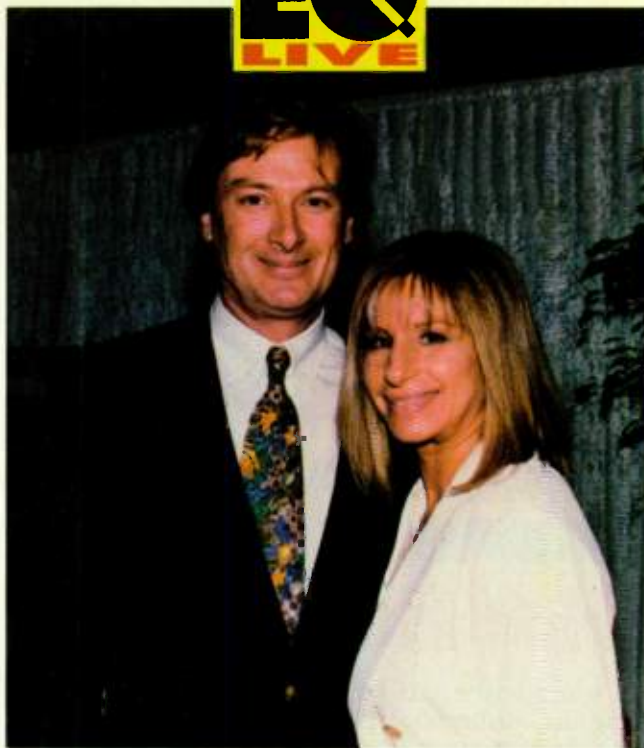
arena, he recently took time out from Apogee to perform sound design and mixing duties for the 1994 Barbra Streisand Tour. *EQ* recently had the opportunity to speak to Bruce regarding Apogee, the Streisand tour, and live sound in general.

**Q: You are responsible for more than just mixing sound for Barbra Streisand. What are some of the other responsibilities you have undertaken for this tour?**

**Jackson:** I started by designing and putting together the sound system for the two Las Vegas shows, which I also mixed. I specified the PA system, designed some new monitors, and even designed a large (5' x 6') see-through TelePrompTer which sits next to me in the audience. Barbra can read it from the stage, but the audience sees nothing. Jim Devenney, who is in charge of the crew, is Barbra's monitor mixer. He knows how I like to distribute the PA and we go to great lengths to cover every seat that we possibly can.

**What did you do as far as the monitors are concerned?**

When I first had a meeting with Barbra's agent (Rob Light) and her manager (Marty Ehrlichman), they told me that the two most important things were the sound and the TelePrompTers. In the past Barbra has not been happy with the sound, specifically the monitors, and I think it's one of the reasons she hasn't been performing live. She has an amazing instrument and a very good ear. For instance, you could actually give her two microphones, the same model from the same manufacturer, and she could listen to them both and give you a very good description of the differences between them, involving highly subtle areas. So she has an amazing, accurate and sensi-



**LIKE BUTTAH:** Jackson and Streisand create near-perfect live sound.

tive ear for all these subtleties. I realized that what she obviously doesn't like is the sound of compression drivers. It's a feeling that I have shared, although my life on the road had been resolved to living with the compression drivers.

About six years ago Apogee Electronics got involved with Roger Quested. Roger had developed the first soft-dome monitors for recording studios and they were very successful in Europe. I was very impressed with these soft-dome drivers. They sound natural and smooth, and actually can get pretty loud. The main problem is that they can't get as loud as compression drivers and they don't bite through in a rock and roll situation. So I called Roger Quested, we had a little chat about it, and I had Clair Brothers contact ATC [ATC manufactures soft-dome drivers—Ed.]. For the Las Vegas shows we got the soft-dome midranges and Morel tweeters and we put together these custom monitor cabinets. Management was very concerned because they knew that Barbra has generally not been

happy with monitors. She walked in, listened to them, and loved the sound. She barely had any comments except for how great it sounded and how happy she was.

**And for this application, the soft-dome drivers will handle the volume level.**

Yes. It can get surprisingly loud. For the tour we actually built some custom enclosures totally from the ground up. On the cabinets for the Vegas shows we took out the compression drivers and tweeters from the standard cabinets and replaced them with soft-dome midrange speakers and tweeters. Then we built the entire enclosure to sit in a trough so you don't see it. The original cabinets used to stick up a bit and you'd see them like a bunch of teeth across the front of the stage. These new cabinets don't stick up at all. We have 16 of them up there, and Barbra loves them.

**What is your opinion of in-ear monitors — were they a consideration?**

In-ear monitors were a consideration, but Barbara absolutely hates them. Usu-

ally the first thing artists do when they put them in their ears is look in the mirror and go "yes" or "no." If they have longer hair, I guess they are covered. But that was not an option for Barbra. Marty Garcia (from Future Sonics) came out and spent some time with her, but she was just not interested in putting them in her ears. I had a very specific idea that I wanted in-ear monitors for the rest of the stage. We have a big orchestra up there and the worst thing that we could possibly do would be to have floor monitors leaking into all the sensitive woodwind and string mics. So I decided from the very beginning that we would have ear monitors on everyone else. We spoke to Steve McCale who was my right-hand man on a Springsteen tour and he had recently mixed monitors for U2 where he used in-ear monitors. So I got him to come in and take care of getting the in-ear monitors together, interfacing with Marty Garcia. All the rhythm section and the percussion players got them — 10 sets — but they are kind of expensive to give to everyone on the stage, over \$1000 per set.

**So basically everyone except Barbra is using in-ear monitors?**

Everyone up there has either in-ear or clip-on monitors. Any of the orchestra who want to have monitoring have little clip-on monitors. The ten rhythm section members (which include the percussion) have in-ear monitors. The rest of the 64 have little clip-on Sony studio-type monitors. If they want, for example, rhythm or piano, they can get it from the other side of the stage using these monitors. Having so many people up there



# Project Studio Paradise



In this age of digital audio, the "golden oldie" processors of yore don't cut it, with their excessive coloration, high noise levels and poor resolution. Nor does the waning breed of studio multi-effects, with their swiss army butter-knife, blah-for-the-buck limitations. The project studio producer/musician must answer to the increasing sonic awareness and demands of the digital age. RSP Technologies understands and embraces this with a line of processors specific to the audio and economic realities of the project studio. From our revolutionary Circle Surround™, to the flexible Intelliverb™ and the incredible Reanimator™, RSP makes the project studio a paradise of processing.

Intelliverb's Virtual Room™ allows you to go where your imagination takes you, a tremendous panoply of reverbs, cutting the edge in the project studio. This verb lets you program not only room size, but the location of the sound source in the room and the listener's position. Craig Anderton in *EQ* said, "it looks as if RSP has come up with a winner for project studio owners". *HS & R's* Nick Batzdorf wrote, "the Intelliverb sounds so good that I'm now disenchanted with the four other effects processors in my studio!"

Nothing new in compression? There is in paradise. Check out the new Reanimator™ from RSP Technologies. Rather than settling for a loss of high-end normally caused by compression, the Reanimator actually allows for selective replacement of high-end loss with its unique dynamic enhancement. The Reanimator precisely tracks the amount of compression being used, (enhancement is not added when no compression is taking place), resulting in an unadulterated mix, with no added noise. A compressor of the highest audio quality, providing the most natural sounding dynamics control possible. Need help with monitoring capabilities while tracking? The Emphasis™ is Paradise found! RSP's unique headphone distribution system offers tremendous flexibility. Each participating musician can set up his own headphone mix for the ultimate in personal monitoring capability. Handle your ever-changing monitoring needs with the best project studio headphone amplifier!

Send \$3.00 (shipping and handling) for your RSP Technologies Project Studio Processing catalog. Put your studio in paradise!

**RSP**  
Technologies

Intelliverb and Reanimator include HUSH® noise reduction licensed by HUSH SYSTEMS

2870 Technology Drive • Rochester Hills, MI 48309 • (810) 853 3055 Fax (810) 853 5937

CIRCLE 71 ON FREE INFO CARD



makes them kind of spread out, causing pockets where more or less of different instruments is required for a good balance.

**And you find that the leakage situation is under control?**

You don't hear anything from the clip-on monitors. Generally I find that not many of the orchestra use them. Some of the French horns, trumpets, and trombones are using them. The orchestra players generally rely on the conductor and there's enough drum ambience floating around the stage for the players to get a pretty good idea of the time. Marvin Hamlisch (the conductor) also has a clip-on monitor.

**So if the orchestra players are unsure of a cue they can watch the conductor?**

Yes. The ear monitors

are more for individual feel and linking the members of the orchestra together. Randy Weitzel mixes monitors for the 64 pieces. He also mixes Marvin's monitors, has individual stereo monitor mixes for each of the rhythm sections, and also sets up the various orchestra mixes.

**Are you handling the house mix by yourself?**

No. The house is too big a job to handle by myself, so I have Chris Taylor and Fred Vogler working with me. Fred is in a small, separate room with two ATC monitors, a 32-channel Clair board, and a 56-channel Yamaha board. His job is to submix the strings to me and also to mix the orchestra cues for the two monitor mix positions. Chris works with me in the house, submixing the rest of the orchestra on a Yamaha

PM4000. I use a twenty-year-old Clair console to combine all the submixes, and mix the rhythm section, effect returns and Barbra's voice. Microphone placement is handled by Stage Technician Chris Bishop and our System Technician is Don Garber.

**Are you miking the strings in sections or per player?**

Per player. We actually have two methods of miking the strings. Inside of the instruments we are using the Sennheiser/Soundlab mics which were recommended to us by (live sound engineer) David Schierman. The pin in the back of the instrument that holds the tailpiece is removed and replaced with a hollow tailpiece. The tailpiece permits a tiny Sennheiser SMS MK 2 condenser mic to slide inside of the instrument. It connects to a little box with a built-in

EQ, and then comes into the PA system. That's the only way to get a lot of isolation and level out of the strings.

**And each string player has this unit outfitted to his or her instrument?**

Yes, all 36 string players in each orchestra (from New York, London and Los Angeles) have this special tailpiece fitted to their instrument — the cello, basses, violas, and violins. These mics sound very good, but because they don't have all the complex upper harmonics you get from listening to the instruments acoustically, so we round out those missing harmonics with a bunch of AKG 451's as overhead mics. Fred's job is to mix all those together and chase all the little solo cues. Then he submixes the different sections so the monitor guys can do their jobs. Fred has a score that he can

*continued on page 108*

## WANT TO RECORD SOUND LIKE A PRO? OF COURSE YOU DO!

That's why you need the award winning **SHAPING YOUR SOUND** video series.

Over 6½ hours of high quality, easy to understand demonstrations, tips and techniques on 5 videotapes. You'll learn every facet of modern recording, including **MICS, REVERB & DELAY, MIXERS & MIXING, EQUALIZERS, COMPRESSORS & GATES** and **MULTITRACK RECORDING**.

132 chapters cover everything from **AMPS** to **ZERO** level. Miking guitars, busses, miking vocals, delay time, the signal path, mixing in layers, attack & release time, bouncing tracks & overdubbing and **MUCH MUCH MORE!!**

**SHAPING YOUR SOUND** includes hundreds of demos, animated sequences and live music examples in HI-FI stereo. There has never been a more complete and comprehensive series.

**SHAPING YOUR SOUND** received the only 11 rating in the history of **MIX** magazine.

In use in hundreds of recording schools worldwide.

**YOU'VE SPENT THOUSANDS OF DOLLARS ON YOUR HARDWARE  
NOW LEARN HOW TO USE IT!  
FOR ONLY**

**\$99.95**

CALL 1-800-777-1576 TO ORDER NOW  
FIRST LIGHT VIDEO PUBLISHING DEALER INQUIRES WELCOME

## Anyone who has heard it knows...



**VT-1  
Vacuum Tube  
Microphone Preamplifier**

**D. W. FEARN**

**610-793-2526**

P.O. Box 57 • Pocopson, PA • 19366 • Fax 610-793-1479

**CIRCLE 91 ON FREE INFO CARD**



# We'll give you 45 days to discover why these are the best headset mics available.

"We went through every head mic we could get our hands on. The CM-311 solved a lot of our problems by keeping the drums and monitors out of the vocals. It's the most natural sounding headset mic we've ever used."

David Baker, Monitor Engineer  
Restless Heart

"The 311 gave use as good a performance as a regular hand mic for sound quality and rejection. They're reliable, comfortable and sound great."

Patrick Hamo, Sales Engineer  
Systems Wireless  
Herdon, Virginia

"The CM-311s give us the best rejection of crowd and car noise of any microphone we've ever used. They're very rugged. Our race announcers use them at all four turns of the track."

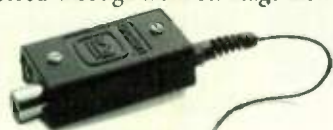
John Royer, Assistant Technical Director  
Indianapolis Motor Speedway Radio Network

CM-311

CM-312

Our headset mics are making an impression on audio pros and performers worldwide. And now, we're giving you the opportunity to try them yourself—risk free!

The CM-311 is simply the best mic you'll hear for gain-before-feedback and rejection—it virtually eliminates bleed-through from on-stage instru-



The Adaptapack® belt pack lets you access an internal 9-volt battery or external phantom power.

ments and hot stage monitors. It's rugged too—to handle life on the road—yet lightweight and comfortable enough for hours of use. And, it's small profile lets you put your best face forward.

The new CM-312 provides outstanding performance with an even less obtrusive profile and lighter weight, making it perfect for aerobics, sports broadcasting and live entertainment.

And now, with our *Loan for Trial* program, we'll give you a CM mic for 45 days to actually hear for yourself how well it performs. After the trial period, if you don't agree that it's the best headset

mic you've heard, simply return it. No questions. No hassles.

All Crown microphones are manufactured in Elkhart, Indiana and backed by our full, three year unconditional warranty.

For more information on the CM-311 and 312, see your Crown representative or call us toll-free at 1-800-342-6939 ext. 49.

 **crown**  
Guaranteed Excellence

P.O. Box 1000 • Elkhart, IN 46515 • (219) 294-3200 • Fax (219) 294-8125

CIRCLE 18 ON FREE INFO CARD

World Radio History



# HE AIN'T HEAVY—HE'S MY RECONER

WITH THE summer tour season just behind us, we're sure plenty of speakers are begging for mercy after use and abuse, high SPL's, and unfavorable weather conditions. To get the scoop on speaker reconing, *EQ* stopped in at Heavy Custom Electronics to speak with company president Richard C. Coscia and manager Elena LaSorella.

In 1976, when Heavy Custom Electronics started out as an independent sound contractor, Coscia quickly learned that there was a need in the audio community for quality electronic repairs and speaker reconing.

As a result, the company decided to begin performing those repairs itself and has since become a factory-authorized service center for manufacturers such as TOA (Heavy is the east coast service outlet), Cerwin-Vega, Bose, Celestion, JBL, UREI, Tannoy, PAS, Electro-Voice, TAD, Turbo Sound, Gauss, Hurricane, and McCauley.

## RICK'S PLACE

Mr. Coscia begins by explaining what he feels are the main problems with speaker reconing: "Many manufacturers do not believe they should sell their recone kits only to an authorized, factory-trained recone center. If I buy a handful of speakers and I really don't know how to recone them, I can call the manufacturer and they will still sell me the recone kits. But if I don't install the kit correctly, the speaker won't sound right and the customer will feel that the manufacturer is selling them garbage. They think that the speaker is supposed to sound a certain way, when



**REAL CONEHEDS:** Take your speakers to a reconing professional.

in fact the recone parts were installed incorrectly."

To verify this situation, *EQ* phoned various speaker manufacturers anonymously and found that a handful

of companies will sell recone kits to the public. However, many manufacturers recommended authorized service centers and discouraged inexperienced

customers from attempting to recone speakers on their own. Several companies told us that they would absolutely not sell the kits to anyone but an authorized recone center.

Another big problem is that the recone process requires certain tools and chemicals that most people don't have access to. Coscia notes that, "The chemical needed to break down the old speaker glue — MEK (Methyl Ethyl Ketone) — requires a license to buy." Elena LaSorella adds, "It is a chemical that cannot be purchased at a hardware store and is essential to the recone process. If you don't have it, you cannot properly do a recone."

## GET SOME CLASS

Some companies (such as JBL) require factory training before a recone kit can be purchased because they want to protect their reputation for quality. This is a subject that both Coscia and LaSorella feel strongly about. Coscia continues, "If I were a manufacturer, why would I want to sell a recone kit to someone who doesn't have the tools, chemicals, knowledge, or workplace to properly do the job? It could only cause problems, because once improperly reconed, the speaker would no longer measure up to factory specifications, the customer would complain, and would never buy a speaker from my company again."

With all of these possibilities, the recone process is best left to a factory-authorized service center. Coscia and LaSorella explain that the only kit that should be put into the speaker is the original manufacturer's replacement kit. Once properly reconed, the speaker

**EQ SPEAKS TO INDUSTRY EXPERTS (AND CONEHEDS) HEAVY CUSTOM ELECTRONICS ON THE IMPORTANT PROCESS OF LOUDSPEAKER RECONING**  
BY STEVE LA CERRA



# GO SOMEPLACE ELSE FOR **ISDN** AND YOU'LL BEGIN TO NOTICE SOME IMPORTANT THINGS ARE MISSING.

**No one gives you complete ISDN service like A/T**

If you want to send high-quality digital audio anyplace in the world, you're ready to move into the exciting new technology called ISDN. But before you get started, you need expert advice, service and technical support to put it all together for you. You need AudioTechniques. We've been the leader in professional



**AudioTechniques**

audio for more than 23 years. And we were the country's first pro audio reseller offering turn key ISDN systems. Our staff is the most experienced in the country and will provide you with all the components and assistance you need to make ISDN work for you. With AudioTechniques, you won't miss a thing.

For a free ISDN guide and more information, call 800 944-ISDN. In NY, call 212 586-5989 or FAX 212 489-4936. 1600 Broadway, NY 10019

**CIRCLE 12 ON FREE INFO CARD**

World Radio History



should look — and sound — exactly as it did when new. Any kind of substitute will compromise the manufacturer's specifications for that speaker. They agree that it is not possible to bring a speaker to spec without the original factory kit. Coscia says, "There are a lot of [recone] places out there that will put an off-brand kit into [for example] a JBL speaker, either to save you money or because they are not authorized to purchase the kit from the manufacturer. But you are losing because you are not getting the full quality that the speaker is capable of producing."

#### CONING CAVEATS

There are things to look for that can help indicate that the speaker was reconed with the factory kit, one being the compliance. After

reconing, the new compliance should be exactly the same as the original. Another thing to look at is the dome. If the original had some sort of logo on it, the new dome will have the same imprint and if the logo was inverted, the replacement should also be inverted.

Coscia advises against purchasing a factory kit and then bringing the kit to a recone center as a means of saving money. If there is a defect in the recone kit, it would be difficult to ascertain whether the problem was a manufacturer's defect or damage that occurred after the kit left the factory.

LaSorella explains that there are some common misconceptions regarding speaker warranty: "Most people think that when a speaker burns out, the repair should be covered under warranty, especially if the

speaker has not been played loudly. But they don't realize that speakers can burn out from underpowering. The amplifier [when clipping] will produce a square wave that can destroy just about any speaker."

"When a customer comes into our shop with a burnt speaker," says Coscia, "we try to determine why that speaker was damaged. For example, a common source of speaker casualties is feedback from turntables. We have found that people remove the rubber mats from the turntable platters. But that rubber is there to reduce the likelihood of feedback from loudspeakers to the phono cartridge. So we try to help our customers eliminate problems at the source."

LaSorella explains that she will even ask customers to bring their entire systems

in for evaluation since the source of a problem could be another component or the manner in which an engineer is using a system. "We had an engineer come in with some blown speakers and we asked to see the rest of his system. The problem lay in the way he was using his EQ — he had a V-shaped curve with the frequency extremes maxed out and all the midrange pulled down. So just reconing a speaker is not enough — we have to find out why that speaker was damaged in the first place, and that includes evaluating the crossover as well."

If you are experiencing recurring problems with speakers blowing out, then Coscia advises that you look at another part of the system. The consistent burning up of tweeters might be an indication of a malfunction in the



## BOARD OF EDUCATION

**P**honic's M-Series four-bus mixing consoles are not high-school dropouts masquerading as college grads. Available in 24- and 16-channel versions with sub groups and master output, these production-quality boards are engineered to deliver clean, quiet mixing performance at a price that won't require a student loan.

For enhanced mixing control and added flexibility, all input channels feature six aux sends assignable to pre and post fader positions, 3-band semi-parametric EQ with sweepable mids and easy insertion of outboard effects on input channels, sub groups and master outputs.

There just isn't enough room in this ad to educate you on all the exciting features and functions found on Phonic's M-2442 and M-1642. For a real education, check them out at a professional audio retailer near you.

ARTICULATE SOUND  
**PHONIC**<sup>®</sup>  
1632 McGraw Ave., Irvine, CA 92714 (714) 253-4000



# Accept no substitute (there isn't one)

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

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

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

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

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

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

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



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

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

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



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



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



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



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

Telex: 668127.

Fax: 061-834-0593.

**AMEK US Operations:**

10815 Burbank Blvd., North  
Hollywood, CA 91601, USA.  
Telephone: 818/508 9788

Fax: 818/508 8619

**AMEK Deutschland GmbH:**

Vorstadt 8, 6530 Bingen,  
Germany

Telephone: 06721 2636

Fax: 06721 13537

# AMEK



# Mmmm... good!

**M**icrophones  
**M**ultitrack  
**M**IDI &  
**M**ore



## S.A.M.S.\*

*\*Specialized Audio & Music Systems (a division of Sam's Music)*

**1-800-391-5050 Nashville**

CIRCLE 59 ON FREE INFO CARD

**ARE YOU A GEAR SLUT?  
DO YOU WANT TO BE ONE?  
THEN BE SURE TO ATTEND:**

**The Roger Nichols 2 Day Intensive  
Master Recording Workshop  
October 22 & 23 1994 • Nashville, TN**

You've read his columns, now hear him speak. The Roger Nichols 2 Day Intensive Mastering Workshop will take you behind the board with Roger at the famed Masterfonics Studios to record professional musicians and learn from the pros. Some of the events and topics that will be included are digital mastering and mixing techniques, use of the AT&T Digital Mixing Core, comparisons between 16-bit, 20-bit, and noise shaped 16-bit outputs, how to clean noisy tracks, and much, much, more. Workshop fee: \$1,050.

If you wish to attend (or want to be put on the mailing list for the next workshop), send your name, address, phone, fax and E-mail address:

**ROGER NICHOLS WORKSHOP, 128 ST. ANDREWS DR.,  
FRANKLIN, TN 37221 OR FAX IT TO 615-646-1951**

**EQ**  
**LIVE**

crossover, and rediaphragming the tweeter can treat the effect but not the cause.

On the subject of rediaphragming a tweeter, Coscia feels that if you are really in a pinch you can do it in the field, but adds that it is "not just a matter of slapping a new diaphragm into the driver." Metal fragments from the old diaphragm must be cleaned out of the gap or they will damage the new diaphragm. Then, while the speaker is on sine wave, the voice coil must be properly aligned with the gap so that there is no buzzing.

Recording studios and sound-reinforcement companies would be well advised to carefully evaluate their needs to avoid a speaker recone emergency. Due to the drying time required for the glues used in reconing, the process takes at least three days to properly complete. If a speaker is crucial to the operation of the sound system, then having spare drivers is a must. "If your livelihood depends upon the speakers, why not invest in a backup pair? Some of the studios we service send their speakers in periodically for recones due to fatigue and wear, before the drivers fail," notes Coscia. This not only helps avoid disasters, but also ensures that the speakers are performing up to factory specifications at all times.

Finally, when purchasing speakers, find out whether or not the driver even can be reconed or rediaphragmed. There are drivers used by Tannoy (in the PBM series) and Yamaha (in the NS-10M) that cannot be repaired, only replaced.

According to Coscia, 98 percent of JBL, UREI, Electro-Voice, Gauss, Cerwin-Vega, Turbo Sound, PAS, and Altec drivers can be reconed and thus restored to factory performance. **EQ**





# REACH FOR IT!

An incredible performance keyboard controller is out there for you.

The world is full of wonderful sounds, and you can put them at your fingertips with the Fatar Studio Series MIDI keyboard controllers! Since feel is such an important consideration when purchasing a keyboard controller, Fatar, the world's largest keyboard manufacturer, has designed their latest models with a remarkable touch of the keys that mimics the feel of the best synthesizers right through to the authentic feel of a traditional acoustic piano.

Fatar has a full range of keyboards that have a multitude of playing features for every musician from

the beginner to the pro, to the multi-media computer user, **starting at only \$199.95**. The synth actions are light and responsive without a hint of sponginess. The hammer-actions on the 88-note controllers are rated the best in the business.

Fatar's natural dynamics are due to response curves that have been refined with the help of some of today's top leading players. The possibilities are limitless. So reach for a Fatar Studio controller at your nearest music store and witness the alternative way of control. **Play it! Enjoy it! Feel the music!**

## **FATAR®**

MIDI CONTROLLERS

CIRCLE 78 ON FREE INFO CARD

Exclusively Distributed in the U.S.A. by

**MUSIC INDUSTRIES CORP.**

99 Tulip Avenue, Floral Park, NY 11001 • (516) 352-4110 • FAX: (516) 352-0754



# GEAR FOR YOUR NEXT GIG

## COMING TO AMERICA

Nexo has only been in business for eight years, but in that time, has earned a reputation throughout Europe and the Far East as a manufacturer of high-quality sound reinforcement systems. Nexo's products are now available in the U.S. through QMI. The PS10 system is comprised of PS10 full-range speakers, which can be safely driven by 500 watts, the LSUB 500 subwoofer, and the PS10 TD Controller. The PS10 is a two-way passive, 8 ohm enclosure and requires only one amplifier per channel. It features a constant directivity asymmetrical dispersion horn that can be rotated on four positions. Backplates for Aircraft-type flying points on top and bottom are standard on the PS10, and it also features an internal stand fitting and two sets of fasteners for fixed installation in horizontal and vertical position with Omnimount clamps. Frequency response is 65 Hz–20 kHz, sensitivity is 98 dB. The LSUB 500's frequency range is 40 Hz–110 Hz with a sensitivity of 101 dB and 300 to 800



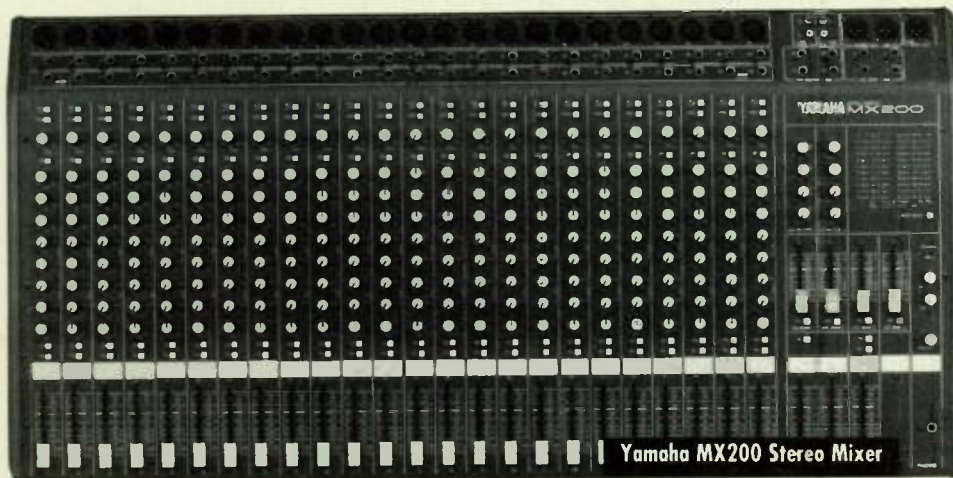
Nexo's PS10 Loudspeaker System

watts of amplification are recommended. The PS10 Controller provides temperature and displacement protection and dynamic control. It permanently monitors the amplifiers and prevents excessive distortion with minimal effect on maximum

SPL. A system containing a pair of PS10's, a pair of PS10 TD controllers, and an LS500 subwoofer retails for about \$5598. For more information, contact QMI, 25 South St., Hopkinton, MA 01748. Tel: 508-435-3666. Circle EQ free lit. #178.

## MAX MIX

The new MX200 stereo mixer from Yamaha is available in 8-, 12-, 16-, and 24-input configurations. The unit features both stereo and mono output busses with master faders and switchable A and B inputs. A inputs are balanced XLR types with phantom power and the B inputs are balanced TRS phone jacks that also accept unbalanced signals. All inputs have pan pots, channel on/off switches, and prefader listen switches. In addition, all inputs have individual patch points. Precise level matching can be obtained through the inclusion of the –20 dB input pad and the –16 dB to –60 dB rotary gain control. An 80 Hz high-pass filter is even built in. All models also feature three-band EQ and four Aux sends (two pre- and two postfader). There is also a headphone jack with level control and four switchable LED bargraph LEDs for monitoring. Level checks are simplified by four fader type Aux send controls with fader-listen switches. The MX200 offers two stereo Aux returns, each with two-band EQ and level control with secondary audio sends if wet monitor mixes are needed. The four configurations are priced at \$728, \$949, \$1988, and \$1499, respectively. For more information, contact Yamaha, P.O. Box 6600, Buena Park, CA 90622-660. Tel: 714-522-9011. Circle EQ free lit. #179.



## BIRTH OF THE MID BLUES

Audio-Technica recently premiered its new line of





Audio-Technica's Midnight Blue

high-performance neodymium Midnight Blues microphones; so named because of their gun-metal blue color. Audio-Technica commissioned industrial designers to create a unique, Eurostyle appearance for the line. Baked-on and heavy-duty, the finish looks good on stage and adds to the mics' durability. All models in the line feature new neodymium elements as well as XLR-type output connectors and new thump-proof "silent" switches that can be locked on to prevent accidental

turn-off. The line also features newly-designed shock mounts. For more information, contact Audio-Technica, 1221 Commerce Dr., Stow, OH 44224. Tel: 216-686-2600. Circle EQ free lit. #180.

## TIGHT SPOT MICROPHONE

Sennheiser is now offering a new compact musical instrument mic, named the MD504. This compact microphone with integrated swivel mount can be easily fitted into the smallest space, making it ideal for drumkits. The MD504's capability to take sound pressure levels of 160 dB without distorting, combined with a very smooth frequency response, makes it an ideal choice for close

miking applications. The MD504 has been designed to withstand the toughest of road tour conditions. The cardioid pickup pattern ensures feedback resis-

tance and isolation. For more information, contact Sennheiser, 6 Vista Dr., P.O. Box 987, Old Lyme, CT. 06371. Tel: 203-434-9190. Circle EQ free lit. #181. **EQ**



Sennheiser's MD 504 Instrument Mic

# You Can Believe Everything You Hear...



## Here!

**Westlake Audio** makes it easy to hear every nuance of sound in your program—background or foreground, dialog, music and effects.

Hear it all where you need it—right up front. Clear. Loud. Well-defined.

Audition a pair at your nearest pro audio dealer or call us.

from acoustic design  
to down beat...

**Westlake Audio**

Manufacturing Group  
2696 Lavery Court, Unit 18  
Newbury Park, California 91320  
(805) 499-3686 • FAX (213) 498-2571



# AB INTERNATIONAL 9620 POWER AMP



AB INTERNATIONAL has been building audio equipment for the U.S. and international markets in their northern California factory since 1975. Their new Model 9620 two-channel power amplifier is specifically designed for professional touring sound companies that require a few extra features in addition to high output power, but it may find other applications as well.

The 9620 is a powerful amplifier, rated at 2800 watts [The current version is rated at 3300 watts. —Ed.] into a 4-ohm load in bridged-mono mode, while only occupying 3 rack spaces. This amount of output power is sufficient to drive multiple loudspeakers

in parallel from a single compact amplifier, thus reducing truck-space requirements. Capable of driving loads as low as two ohms, the 9620 is designed to handle the stress of touring sound applications. The high efficiency of the 9620 is due to the Logic Gated Output, akin to class H power amp designs. The patented 9620 approach uses a six-level DC supply that keeps all the output devices active, switching to higher DC-rail voltages on demand. This high-efficiency design reduces power-rail switching artifacts while maintaining a very high damping factor, especially on extremely reactive loads.

The compact size of the 9620 does not mean small

power transformers or storage capacitors (four — 26,000 mF, though. The 9620 weighs 51 lbs. (23.1 kg) and also extends deep into the rack due to the substantial size of the dual fan-pack at the rear of the amp. Although not exactly lightweight, the weight is intelligently distributed within the case. This last fact, in addition to the 9620's 14-gauge cold-rolled steel case, offers plenty of road-worthiness.

## LET IN FLOW

The clean front-panel design hides the exhaust for the forced-air cooling. This thick aluminum panel stands off the chassis to provide a 3/4-inch (9 mm) gap for air flow. The rear-mounted fans draw air in over the heat sink fins at the rear of the amp and then across the PC boards and toroidal power transformer before leaving through this gap. A metal screen prevents errant bits from falling down the front of the amp and into the power supply just inside. This design gives the 9620 a nice finish when installed because it hides the usual cooling grill work. The other advantage is that the fan noise is slightly attenuated by the time it reaches the front of the amp, thus reducing the mechanical noise. Although the two dual-speed fans are not excessive-

ly noisy, they might not be suitable for installation in control rooms or quiet performance venues.

The input level controls for the 9620 are just under the two bright, three-color, 11-segment LED level meters on the front panel of the amp. These two large knobs offer 40 steps of attenuation (mechanical detents) with excellent matching of levels between channels, typically within 0.25 dB (see fig. 1). The taper of attenuation is also optimized so that very fine adjustments (>1 dB) can be made in the middle of the control range. When resetting a system's gain structure to suit different operating levels or program material, this accurate control of input level will be an asset.

Nominal input sensitivity for full power is 1.5 V RMS connected to the ingenious Neutrik Combo connector (a female-XLR with the center punched out to accept a standard 1/4-inch phone plug). Balanced-input connection can be made with either an XLR or 3-conductor phone plug and an unbalanced 2-conductor phone plug is also accepted. While offering the maximum flexibility in the minimum of space, this latching connector also prevents two connections being accidentally made to a single channel, which is possi-

## ROAD TEST

**MANUFACTURER:** AB International Electronics, Inc., 1830-6 Vernon Street, P.O. Box 1105, Roseville, CA 95678. Tel: 916-783-7800.

**APPLICATIONS:** Driving power-hungry loudspeakers in touring and installed sound-reinforcement systems and studios.

**SUMMARY:** A well-built compact amp capable of significant output power.

**STRENGTHS:** Heavy-duty construction; accurate input level controls; convenient interface options.

**WEAKNESSES:** Power consumption at full power into 2-ohm loads (>30 Amps) is greater than is normally provided by a domestic standard 120-volt AC outlet; fan-cooling precludes use in some applications.

**PRICE:** \$2295

**EQ FREE LIT. #: 182**

**BY WADE MCGREGOR**



PAGE	BRAND	INFO#	PHONE#	PAGE	BRAND	INFO#	PHONE#
11	3M	01	612-733-3477	60	JRF Magnetic Sciences	42	201-579-5773
43	Akai/IMC	03	817-336-5114	58	KABA	43	415-883-5041
03	AKG	XX	415-351-3500	27	KRK	28	714-841-1600
CIII, 21, 53	Alesis	02, 05, 04	5310-558-4530	60	Leigh's Computer	44	215-658-2323
17, 93	Amek	08, 06	818-508-9788	45	Lexicon	45	617-736-0300
109	Ampex	84	415-367-3809	34, 35, 111	Mackie Designs	46, 95	206-487-4333
125	Aphex	88	818-767-2929	42	MIDI Solutions	47	800-561-6434
08	Ashly	68	716-544-5191	75	Musician's Friend	35	800-776-5173
09	Audio Inst. of America	66	415-931-4160	107	Musician's Institute	80	213-462-1384
91, 67	AudioTechniques	12, 10	212-566-5989	68	Night Technologies	48	801-375-9388
78, 79, 115	BBE	11, 97	714-897-6766	55	O.S.C.	49	415-252-0469
23	Behringer	17	516-932-3180	59	Otari	61	415-341-5900
128	Burlington	100	516-678-4414	24, 25	Panasonic/Ramsa	50	201-348-7846
56	Big Fish Audio	56	818-768-6113	13	Peavey	51	601-483-5365
105	Caig	76	619-541-1799	108	Pertek	83	714-858-1685
72	Caruso Music	14	203-442-9600	92	Phonic Hi-Tec	92	714-253-4000
85	Community Light & Sound	73	215-876-3400	63	Pinnacle Micro	94	714-727-3300
48	Conneaut Audio Devices	15	216-593-1111	66	Polyline	53	708-390-7744
77	Conservatory of Recording	77	602-496-6508	41	Premium Entertainment	54	415-989-6245
89	Crown	18	219-294-8000	67	QCA	55	800-859-8401
18, 19	D&R	194	409-588-3411	82	Rane Corporation	56	206-355-6000
05	dbx	25	415-351-3500	55	Rhythm City	69	404-320-7253
CIII	DIC Digital	27	201-692-7700	71	Rockford/Hofler	57	800-366-1619
72	DIC Distributors	20	800-522-2732	57	Roland	58	213-685-5141
61	Disc Makers	21	215-232-4140	87	RSP Technologies	71	313-853-3055
40	Discount Distributors	22	516-563-8326	44	Sam's Music	59	615-371-5000
46	Drawmer	23	508-435-3666	12	Sascom Marketing	60	416-420-3946
62	Drumtrax	93	617-387-7581	65	Sennheiser	61	203-434-9190
88	D.W. Fearn	91	215-793-2526	15	Shure	63	708-866-2200
39	East-West	39	310-858-8797	84	Sound Tech	64	708-913-5511
108	Eccentric Software	77	206-628-2682	73	Soundtracs	67	516-932-3810
60	Euphonix	26	818-766-1666	113	Studiomaster	96	714-524-2227
38	Europadisk	29	212-226-4401	103	Sweetwater Sound	79, 106	219-432-8176
31	Eventide	48	201-641-1200	47, 85	Tannoy America	81	519-745-1158
32	EVS	42	210-614-0574	07	Tascam/TEAC America	72	213-726-0303
95	Fatar	78	516-352-4110	100	Tech 21	82	212-315-1116
88	First Light Video	33	800-777-1576	74	The John Hardy Co.	70	708-864-8060
34	Fastex	29	310-921-1112	77	The Recording Workshop	74	614-663-2510
37	Full Compass	46	800-356-5844	58	Thoroughbred Music	65	800-800-4654
81	G-Prime	37	212-765-3415	83	Vestax	86	707-427-1920
08	Gemini Sound	47	908-969-9000	41	West L.A. Music	66	310-477-1945
31	Genelec	62	508-435-3666	75	Westlake Audio	97	310-477-1945
14	Glyph	38	607-275-0345	115	Whisper Room	99	615-585-5827
40	Guitar Guitar	39	800-662-0032	07	Yamaha Pro Audio	90	714-522-9011
115	Illbruck	95	800-662-0032				
101	Innovative Quality	40	702-435-9077				
62	Institute of Audio Research	92	212-677-7580				
CIV	JBL Professional	XX	818-909-4500				



ble when using separate jacks. (Some manufacturers have offered that duplicity to allow amps to be jumpered togeth-

er.) The 9620 has an additional male-XLR connector below the channel-two input that is wired in parallel to it for this purpose.

Rear toggle switches are provided for lifting the audio ground from the chassis, selection of stereo, par-

allel-mono, or bridged-mono operating modes. Labeling and layout make connection and configuration clear, with the connector conventions also noted. However, there are no warnings to prevent selecting between normal and bridged-mono modes when the amp is on.

The parallel-mono mode combines the inputs of both channels but allows independent adjustment of the output level for each channel. This is a convenient way to make this mode handle many different applications. Output connection for bridged-mono mode is conventional (both hot output terminals — left channel is +), but the preliminary information supplied with the amp did not go into these details. There was no mention there or on the amp concerning connections



FIGURE 1: Matching between channels of stepped input attenuation, first 20 dB shown.

# SOUNDBURST.

Get a Warehouse of  
Tube Amp Rigs  
in a Single Rackspace...  
with SansAmp PSA-1.



TECH 21 · NYC

SansAmp™ Model PSA-1. Manufactured in the U.S.A. by Tech 21, Inc. 1600 Broadway, NY, NY 10019 • 212-315-1116 • Fax: 212-315-0825

World Radio History

CIRCLE 82 ON FREE INFO CARD

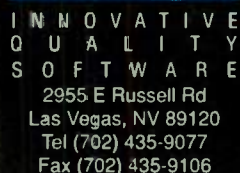


***The Fastest, Most Affordable Hard Disk Editing Solution Available Today!***



**NEW!**

- Sold Separately (\$349.00) Requires SAW Software**



**4 Simultaneous Stereo (8) Playback Tracks**  
**SMPTE Sync & Generate Capability**  
**Live Automated Non-Destructive Mixing**  
**Real-Time Preview Of All Data Processing Functions**  
**Backup & Restore Entire Editing Sessions To Audio DAT**  
**Vari-Pitch In Tenths Of A Semitone Resolution Without Waveform Glitching**  
**Incredibly Fast Assembly Language Waveform Displays & Screen Redraws**  
**Simultaneous Synch Record/Play (Soundcard Dependant)**  
**MIDI Region & Play Sequence Trigger Capability**  
**And Much, Much, More! For Only \$599.00**

## World Radio History

"This program really screams. The speed of access for sound files and the ability to change the display quickly enough to allow scrolling of the waveform as the music plays are truly amazing." (Dave Tosti-Lane)





## NEW BOOK! DIGITAL PROJECTS FOR MUSICIANS

**By Anderton, Moses,  
and Bartlett.**

Even if you know nothing about electronics, you can build your own single-board MIDI computer and run 20 different software projects, from custom instruments to MIDI data processors. It's easy, it's fun, and supported by parts kits. As Herbie Hancock says, "This is the most complete electronics course that I've seen, and yet it's geared toward musicians. It makes everything so simple." 364 pages, softcover. \$19.95.

## ANDERTON'S UTILITIES FOR MAC

MIDI master Craig Anderton has assembled a disk of hot utilities for any Macintosh, from Plus to PowerMac. Sequences are standard MIDI files, samples are 16-bit AIFF, and documents are MacWrite/MacPaint compatible. Here are just some of the tidbits on this 800K disk:

- Test sequences and a MIDI terminal program to streamline and diagnose your system
- Drum loop construction set—cut and paste your way to a slammin' rhythm track in seconds
- Controller library with pre-programmed vibrato, sample-and-hold, synchronized LFO waveforms, etc.
- Custom file icons (System 7 only)
- Complete set of AIFF test tones
- Vintage Minimoog waveform samples
- Forms for track sheets, DAT takes, backups, etc.
- Useful information and formulas, selected articles from EQ, and more!

At \$29.95, you can't afford not to have this disk.

Order today! Send your check or money order to Craig Anderton, PO Box 966, Ukiah, CA 95482.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

\_\_\_\_ Copies of disk @ \$29.95

\_\_\_\_ Copies of book @ \$19.95

Add \$5 shipping per book

Calif. res. add 7.5% tax

Order total \_\_\_\_\_



for the different operating modes. [The manufacturer states that a complete user's guide is now included with the amplifiers. —Ed.]

### POWER TRIP

Output connectors are five-way binding posts with significantly large apertures, capable of handling at least 12-gauge loudspeaker cable. The large fan-housing protruding from the back of the unit offers some protection for the input and output connectors when the unit is not mounted in a rack.

Frequency response (20 Hz to 20 kHz,  $\pm 0.25$  dB) and noise figures ( $>105$  dB below full output) are in keeping with the best amplifiers in this class. The output power ratings of 750 [825 watts in the current model] watts/channel @ 8 ohms to 1500 [2000 watts in the current model] watts/channel @ 2 ohms per channel are with a single channel driven. The very low output impedance of the 9620 is rated by the manufacturer to produce a damping factor of 500:1 below 1 kHz. Listening to the amplifier I found it able to tightly control low-frequencies, but compared to my reference amplifier and a few other amps recently evaluated, there was a slightly brittle coloration to the tone of some instruments. This latter criticism was only noticeable on high-quality studio monitors and masked when used in live-sound applications.

Sound system protection features include a delayed on/soft-start circuit (doesn't dim the room lights when switching on the amp), output current limiting (short-circuit protection), soft-clip circuits, and DC-fault sensing. The soft-clip circuit activates input limiting only when the limits of the DC supply rails are reached. This approach yields full power before limiting but prevents severe clipping of the output

signal. Thermal sensors activate the higher fan speed or, if that still isn't enough, the amp will shutdown to prevent internal damage from excessive temperature. The power switch is also the circuit-breaker, obviating the need for AC power fuses.

The internal parts are all based on a modular design that is field-serviceable using little more than a screwdriver. Pull the defective module and pop-in the replacement. This reduces down-time and shipping costs if catastrophe strikes. Repairs are covered under the 36-month warranty, with the user simply paying for the freight.

Users interested in pulling every watt of output from the 9620 will have to consider providing good stiff AC power to the unit. If run at maximum power it will draw well over 30 amps from a 120-volt supply, requiring careful attention to the source of AC power feeding the amplifier rack. Running it at the 2-ohm rating from a 15 or 20 amp convenience outlet nearest the stage of a club may be impractical (even hazardous). The 9620 can be ordered for higher AC power voltages, and many touring companies use 208-volt power distribution systems — the optimal supply voltage for this amp. The 120-volt review unit did not have a connector on the captive AC cord, although the manufacturer stated that it is normally shipped with a domestic Edison connector and, if required, can be specified with a twist-lock type. The 9620 is currently awaiting UL approval.

The 9620 is ideal for touring sound-reinforcement applications. It would also make an excellent low-frequency amp in power-hungry multiway studio monitors. The bonus of precise input level controls and versatile connection schemes make it worthy of consideration for installed systems, as well. **EQ**



# WHO YA GONNA CALL?



FOR MIDI KEYBOARDS, SYNTHS & SAMPLERS,  
STUDIO EQUIPMENT, SOUND REINFORCEMENT,  
COMPUTER HARDWARE AND SOFTWARE

Let's face it: All mail order dealers offer you low prices. So how does Sweetwater Sound consistently win customers if everybody is offering the same low prices?

## The other guys offer:

### A CATALOG

They must assume you can pick out the product you want and need just by looking at the pictures.

### AN 800 NUMBER

They're nice enough to pay for the call so you can talk to someone who will be glad to take your order. But can they really answer all your technical questions?

### A RECEPTIONIST, SALESPERSON AND SERVICE REP ALL WRAPPED INTO ONE

Sorry, but we're not exactly sure why.

### AN ATTITUDE

They're extremely busy folks who probably figure they don't really need to take the time to treat you right. After all, aren't you just looking for a low price?

## Sweetwater Sound offers:

### OVER 20 FULL-TIME SALES ENGINEERS

All of whom have serious real-world experience. If we can't talk to you on your level, take the time to answer your questions and recommend exactly the right products for your specific needs, plus offer a 30-day money-back guarantee, we'd be just another music store.

### ON-SITE SERVICE DEPARTMENT

With 11 people trained in component-level repairs, so we can fix most problems immediately and offer superior phone support.

### FREE SUBSCRIPTION TO SWEET NOTES

An exclusive, unique publication that highlights the latest products and provides valuable detailed information to our customers.

### 24-TRACK PROFESSIONAL RECORDING STUDIO

Right on the premises, so we can use and evaluate all the instruments and audio equipment we sell in a real life studio environment.

## The Bottom Line...

We want to win you as a customer for life. In order to do this, we had to do more than just offer low prices — we had to redefine how we do business and combine the best of mail order with the best personalized pro audio sales in the industry. In fact, we're now America's fastest growing music retailer. If you haven't yet experienced the Sweetwater Sound difference, call us today. We know you'll be pleasantly surprised. So who ya gonna call?

**OUR EXCLUSIVE GUARANTEE:**  
"If you don't like it, we'll take it back — with no hassles!"

# Sweetwater

## SOUND INC.®



5335 BASS RD. • FT. WAYNE, IN 46808 **(219) 432-8176** FAX (219) 432-1758

Now with some of the longest hours in the business: Monday - Thursday 9 AM to 9 PM, Friday 9 AM to 7 PM, Saturday 9 AM to 6 PM

CIRCLE 79 ON FREE INFO CARD

World Radio History



# I N R E V I E W

## Tube Tech Compressor/Limiter



**MANUFACTURER:** Tube Tech, distributed in the U.S. by AudioTechniques, David Schecterson, Product Manager, 1600 Broadway, New York, NY 10019. Tel: 212-586-5989.

**APPLICATION:** Good for anyone looking for real tube dynamics control.

**SUMMARY:** Dual-channel tube unit with separate compressor and limiter in each channel, plus six Fairchild attack/release presets that override the front-panel attack and release pots.

**STRENGTHS:** Unmistakable tube sound; spectral balance retained under heavy compression/limiting; stonking (well-chosen) presets; excellent all-around compressor/limiter performance.

**WEAKNESSES:** Temptation to overuse is enormous; still ain't cheap.

**PRICE:** \$2993

**EQ FREE LIT. #:** 183



TUBE TECHNOLOGY is one of the few areas where most people still agree. Most either lust for it on the quiet or are open about their obsession, though few can actually afford it. This inaccessibility is part of the attraction, and tubes remain one of the few enduring retro blips in an industry that is otherwise preoccupied with the latest and the newest.

Modern tube outboard units, such as the range from Tube Tech, are spared the unpredictable reliability of the original designs and essentially offer the user the best of both worlds — the karma and vibe of the old, coupled with the undentable durability of the new.

The LCA2B offers a full two channels of fully variable compression that can run with a separate limiter on each path. It has transformers on the inputs and outputs; uses two ECC81's, two ECC82's, and two ECC83's; has big knobs and switches; and it's a blue 2u. Attack and release times can be manually adjusted on pots or can be substituted by six attack/release presets designed to approximate those on the old Fairchild.

The LCA2B is actually the upgraded LCA2A. The additions include a limiter bypass switch, a longer maximum attack time (70 ms), and an output gain pot that replaces the input

gain control.

Operationally, the LCA2B's a dream with everything doing what it ought to, aided by the size of the knobs and the reassuring snap of the switches. The unit benefits from having a bar graph display for gain reduction rather than the mechanical meter found on the older and larger CL1B compressor.

### COMPRESSION/LIMITING

There's a fine degree of control available in the compressor, with wide-ranging values for things like gain and threshold — maybe there's not the fastest attack time on the planet, but certainly there's a realistically usable one. The presets are not a gimmick; they give you fast and repeatable results, as well as more in the way of release time than you'd probably want to have on a pot.

Presets 5 and 6 are extremely musical on general program (see sidebar), with Presets 1 and 2 superb on solo sources, particularly voice, with a high ratio. These presets are so well balanced that the temptation to forsake manual control is overwhelming; they really add value.

Treble loss under compression has long been a recognized problem, with some manufacturers actually stretching to incorporate top-end

### THOSE PRESETS IN FULL!

Selecting Preset on the Manual/Preset switch disables the attack and release pots and gives access to six presets.

Preset	Attack (ms)	Release (s)
1.....	1.5.....	0.25
2.....	1.5.....	0.8
3.....	3.....	2.2
4.....	6.....	5.0
5.....	3.....	0.5/4
6.....	1.5.....	0.5/4/20

The release ballistics in Presets 5 and 6 switch from 0.5 s on short peaks to 4 s on longer peaks, while Preset 6 also wallops on a 20 s release for continuously high levels.





enhancement to overcome this side effect. Almost peculiarly, this is not nearly such a big issue with the LCA2B. When it limits, the light comes on and spectral balance remains substantially intact while there is the desired squash on the signal. If anything, bass and treble actually sound as if they're enhanced. This is an absolute monster treatment, as is heavy-ratio compression, on kick drums, particularly synthetic beat boxes and super-deep bass.

As with all units that have separate limiters and compressors, the beauty of the arrangement is that you set your compression "effect" and leave the limiter to take care of the real dynamic control. You end up leaving the limiter in as a safety measure because you can, and because you know that even if something does hit the end it's still going to sound good. Working with digital? This is your man.

#### IMPRESSIONS

The unit has a sound. If you put a CD through it on a nice soft threshold with the minimum 1.6:1 ratio on the eminently usable Preset 5 and leave it to play in background, you get very comfortable and attached to the sound. Switch it out of circuit and it

sounds as if air has been sucked out of the track.

The LCA2B flavors audio in a subtle and pleasant manner even when it's not being asked to do very much at all. If you track with one of these you can expect to get decidedly different results simply by having it in the sound chain. And the better the source, the finer the enhancement. For vocals or voice-overs you can impart a touch of expensive class and up-frontness regardless of the mic being used. Stick it over your main output and master as hot as you dare.

The biggest temptation is to hammer everything down hard, and this sounds great — very period-like, and far less objectionable than your average nontube equivalent. What it can do for bottom end defies description. Again, you don't experience the sort of spectral de-emphasis that you would expect from heavy compression. As a result you're likely to use more than you would normally. Indeed there is a danger of overusing the LCA2B, and you've got to keep asking yourself whether subduing the dynamics of a track makes contextual sense.

However, it is the finesse that leaves the lasting impression because this is not a crude device. It's a precision dynamics processor with very fine con-

# ProGold

## ADVANCED CONTACT TREATMENT

- Improves Conductivity
- Reduces Noise & Distortion
- Improves Definition & Clarity
- Extends Dynamic Range
- Seals & Protects Surfaces

**The Only Product that Conditions & Protects Plated Surfaces and their Base Metals!**

Even the finest equipment cannot guarantee noise-free operation. One "dirty" connection anywhere in the signal path can cause unwanted noise, distortion and signal loss. Considering the hundreds (if not thousands) of connections in electronic equipment today, it is only a matter of time before they begin to fail.



CAIG AUDIO/VIDEO PERFORMANCE KITS

#### How Does ProGold Actually Work?

ProGold outperforms all other contact cleaners, enhancers and lubricants. Due to its unique properties, it deoxidizes and cleans surface contamination, and penetrates plated surfaces and molecularly bonds to the base metals — **NO OTHER PRODUCT DOES THIS.**

ProGold fills the gaps in the contact surfaces, increasing the effective surface area and current flow (conductivity). ProGold penetrates the plated surface and molecularly bonds to the base metal to seal and protect it. Conduction through a ProGold coated surface occurs in three ways. First, ProGold is displaced by electrical arc, shock wave or simple mechanical pressure and redistributes itself along the surface when the disturbance is removed. Second, a thin insulating film of ProGold is dispersed by an electrical field. Finally, conduction takes place through very thin films of ProGold by means of a quantum-mechanical phenomenon called "tunneling." Simply stated, electrons travel from one side of a thin film of ProGold to the other without passing through (this is the same effect that gave the tunnel diode its name).

#### Why Use ProGold?

ProGold increases the performance and reliability of all audio/video and computer equipment. It improves conductivity for greater definition and dynamics, and reduces noise & interference and lowers distortion. Unlike other products, it also stabilizes connections between similar and dissimilar metals. ProGold provides long-lasting protection (1-10 years), on gold, silver, rhodium, copper and nickel connections. Use ProGold on all connectors & contacts for maximum performance & protection.



16744 West Bernardo Drive,  
San Diego, CA 92127-1904  
TEL: (619) 451-1799,  
FAX: (619) 451-2799

**1-800-CAIG-123**

CIRCLE 76 ON FREE INFO CARD

EQ OCTOBER 105





tral that also happens to sound nice.

If you've never actually tried a tube compressor you really ought to, because the response of this device is quite unlike anything you're likely to have experienced so far. As an attempt at a description, the LCA2B sounds more like what you would imagine compressed audio to sound like than what compressed audio normally does sound like. It's somehow gentler and more balanced. It stinks of class.

#### CONCLUSION

It's difficult to regard the LCA2B as cheap, and it takes hard justification just to slip it in under the good-value-for-money banner if you're expecting extras like an expander tagged on. But with this product you're into the territory of subjective quirkiness that is associated with a top-end piece of tube gear. Looked at in this light, the LCA2B is very special indeed. And it looks great, feels great, and sounds great. Play with one. —Zenon Schoepe

### TUBE TECH DESIGNER JOHN PETERSEN

Lydkraft, the Danish company that manufactures Tube Tech products, was started by president John Petersen in 1977. Pultec EQs grabbed his attention first in 1985. Petersen made a copy of the Pultec EQ P1E and hasn't looked back since.

Petersen believes there is a reason for the appeal of the PE1C and ME1B tube EQs. "I don't think the frequencies are that important, but what is is that many EQ designers today make very sharp boost curves, and that doesn't sound so good. If you watch people using the PE1C, most of the time they have the bandwidth very close to broad, and that is very broad — the Q is about 0.7. That's part of the secret. Anything really sharp always sounds nasty; broad is pleasant."

The Tube Tech CL1B compressor, which has now been augmented by the LCA2B, was inspired by the Teletronix LA-2A unit but uses different circuitry with fully variable attack and release times.

Petersen points out that the LCA2B is not a copy of the Fairchild, although the six attack/release presets are. "People say my unit is cleaner, but that's a hard thing to judge. When you talk about a compressor, the word clean is inappropriate. Compression is distortion. But there are polite ways of doing it that don't sound so awful."

The LCA2B is an updated version of the company's LCA2A. Petersen documents the differences between the two units and the reasons for doing them: "The input gain pot has been turned into an output gain, the attack time has been extended from 10 ms to 70 ms because people liked the slow attack time, and I've also put an on/off switch on the limiter," he says.

"The VCA tube in the LCA2A had to be selected carefully, and we were only accepting about 10 percent. On the LCA2B I've changed the tube to one with a rejection rate of 10 percent, but I've had to fix the attenuation at the input — otherwise it would be too easy to overload. Using the spare pot as an output gain fits in with what some people wanted.

"The power supply has also been redesigned because it could get hot at 230V," adds Petersen. "Even so the price stays the same." —Zenon Schoepe

## AMERICA'S FASTEST GROWING MUSIC RETAILER



There's a simple reason for Sweetwater Sound's success. Not only do we have the equipment you want in stock at affordable prices, but we also offer outstanding value: one-on-one customer service and quality after-the-sale support other dealers can only dream about. Our sales engineers all have real-world MIDI and recording studio experience, so they can direct you to the perfect product for your particular needs.

But don't just take our word for it. Give us one try and we're willing to bet Sweetwater Sound will be your first choice for audio, MIDI and recording equipment for a lifetime!

### OVER 80 OF THE BEST NAMES IN THE BUSINESS

Korg • Roland • Opcode • Sony  
Mark of the Unicorn • Mackie  
Digidesign • Kurzweil • Marantz  
Tascam • AKG • Ramsa • DBX  
KRK • Panasonic • Neumann  
Fostex • E-mu • Digitech • JBL  
Summit • Sennheiser • Lexicon  
Fatar • Furman • Tannoy • KAT  
Crowne • BBE • Carver • Shure  
3M, Ampex and Denon Tape  
Mac & IBM Software & Interfaces

**OTHER MAJOR BRANDS TOO!  
HUGE IN-STORE INVENTORY!**

OUR EXCLUSIVE GUARANTEE:  
"If you don't like it, we'll take  
it back — with no hassles!"



5335 BASS RD. • FT. WAYNE, IN 46808

**(219) 432-8176** FAX (219) 432-1758



## RECORDING INSTITUTE OF TECHNOLOGY

**W**e are very proud to introduce RIT as the newest member of the MI family. When we decided to start a recording program, we wanted to create a totally real world environment. So, we built a world class studio. We got Grammy winner Roger Nichols - the man behind the classic Steely Dan albums, to help design the program and some great engineers to teach the classes. This program is as close to the real world as is possible. The studio is real world, the equipment is real world and some of today's best musicians are banging on the studio door wanting to record. But the key difference between RIT and any other recording school, is that this one is hands-on. And when we say hands-on, we're not kidding, we mean real world hands-on. All music all the time...



*The studio features an SSL SL 4000 G+ Series Mixing Console and Sony PCM 3324S digital recorder. Totally real world.*

**"...real equipment, real musicians and real hands-on..."**



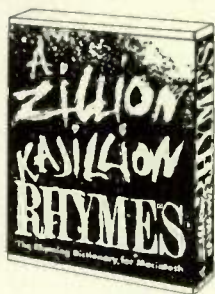
**MI**  
MUSICIANS INSTITUTE

**CIRCLE 80 ON FREE INFO CARD**

Call or write for free catalog: Musicians Institute, 1655 McCadden Place, Dept. 8171, Hollywood, CA 90028 Tel: (213) 462-1384 Fax: (213) 462-6978



**Great lyrics, FREE  
in every box! \***



**\*(Some assembly required.)**

Tired of rhyming "she" with "me"? Try A Zillion Kajillion Rhymes™, the amazing rhyming dictionary software created by and for professional songwriters. Because great lyrics don't write themselves.

"A killer rhyming dictionary... I recommend it unreservedly..." — MacUser, 8/93

Windows or Macintosh only \$39.95  
plus \$4.50 Priority Mail shipping

Call 800-436-6758



ECCENTRIC SOFTWARE

P.O. Box 2777  
Seattle, WA 98111  
206-428-2687

**As featured on MTV!**

CIRCLE 77 ON FREE INFO CARD

## CONTROL YOUR OWN MONITOR MIX!

# Monitor Mate™

**Personal Monitoring System**

DOES NOT AFFECT  
HOUSE MIX

XLR MIC INPUT &  
MIC OUTPUT

SPKR, HEADPHONE  
& LINE OUTPUTS

BASS & TREBLE  
CONTROL OF MIX

EASILY CLIPS TO  
MIC STAND

MANY OTHER  
FEATURES!



**only \$349**

For FREE info call the  
MonitorMate Hotline at  
714/858-1685

**PERTEK**

22431-B160 ANTONIO #459  
Engineering Incorporated R. S. MARGARITA, CA 92888

CIRCLE 83 ON FREE INFO CARD

## BRUCE JACKSON

*continued from page 88*

read along with to follow all these cues.

**And how are your ears after all these years in the business?**

I'd say they have suffered from the rock and roll shows. I can tell I have definitely banged them around a bit. But I still have no problem making the transition to this much lighter orchestral-type sound. I have made the rock/orchestral transition many times before. The last tour I did was Bruce's *Tunnel of Love* tour, and the stage volume was much louder. Rock and roll needs to be loud to fully involve the audience.

**What was the event that made you decide to start Apogee? You must have needed something that wasn't available.**

I needed a new challenge and I couldn't stand being on the road anymore and I had been designing electronic gear along the way. So I had a pretty continuous involvement in the technology and then I was involved with some friends in Australia who built the first sampling system, the Fairlight CMI. I promoted that in between Springsteen tours.

**Did that lead to your building of the first Apogee filters?**

Partially. The sound of digital audio bothered me and I became interested in finding out why. The filter really happened when I got together with a friend in Switzerland named Christoph Heidelberger. He and I and my wife at that time developed the filter. We knew there was a problem in that area and so we played around and did a lot of experimentation until we came up with something that sounded a lot better. We thought that if we sold a few thousand we'd be in good shape, but we actually sold 25,000 over a period of time. That was a large chunk of tracks from all the digital multitracks in use. Then Mitsubishi started fitting them as standard, and most Sony digital multitracks were refitted with Apogee filters.

**With Apogee, so successful, why did you decide to go back to touring?**

Well I haven't really gone back to touring. This is definitely just a transitory thing. Harry Sandler (an old friend from the Springsteen days) had Audio Analysts call me up to see if I was interested in the project, and I told them I wasn't interested. Harry was called in to put the two Vegas shows together and finally he phoned me

directly and said, "Why don't we get together and do it — it'll be fun." It was only going to be two shows in Las Vegas, so I did them. Those shows were very successful, so they asked me to do the tour. I didn't think I could and I had, in fact, lined up someone else to do it. I was going to get it started, then leave, but then Barbra insisted that I do it, so I ended up doing the whole tour. She is very much involved, very much hands on. I've unfortunately been given a pager so she can get ahold of me easily. She soon knows everyone's name — all the tech people — and she is very much into knowing what things might be wrong and why. She is constantly honing what she is doing...honing, changing, fixing, being very involved.

**Has she made any recommendations to you concerning equipment?**

She was involved in the choice of microphone and we initially agreed that she would be on a cable, which would be my choice. But she wanted to feel the freedom of being on a wireless mic and that was what we decided to go with. Then we went through a bunch of different wireless mics until we found one that she liked. Vegas involved three different engineers: Shawn Murphy (recording the record), Ed Greene (recording the show for HBO), and myself. We all had to agree on the mic she would be using, an interesting concept in itself!

In Vegas the system we decided on a Samson with a Shure 87 head. Then Shawn Murphy recommended a Vega Systems Dynex II using the same head. We tried both of those and Barbra liked them, so we got both systems. We essentially have gone with the Dynex II system and have been using the Samson as a backup. They are both very good systems.

**After years of mixing live sound, what do you feel is one of the most important things you have learned?**

I feel the thing is to control your situation as best you can, and to not be put off by people pushing you in a conflicting direction. Know that while you are trying to do the best possible job on the sound, it does not always coincide with what the accountant or others are thinking. For example, it was very important that Barbra have a very good experience in Vegas to open up the window of Marty (Ehrlichman) convincing her to do a tour. The reason things went so well in Vegas was that we did not make unnecessary compromises in the level of quality that we were trying to achieve. **EQ**





*More records go gold on Ampex than on  
all other tapes combined.*

**AMPEX**

Ampex Recording Media Corporation 401 Broadway, M.S. 22-02, Redwood City, CA 94063-3199 ©1993 Ampex Recording Media Corporation

**CIRCLE 84 ON FREE INFO CARD**

World Radio History



# IN REVIEW

## Innovative Quality Software SAW



**MANUFACTURER:** Innovative Quality Software, 2955 E. Russel Rd., Las Vegas, NV 89120. Tel: 702-435-9077.

**APPLICATION:** A fast, affordable, and professional editor that gives you multitrack, real-time mixing and SMPTE trigger capabilities on the IBM PC for use in the project, broadcast, or video postproduction studio.

**SUMMARY:** Software-based virtual multichannel hard-disk editor without the need for additional, expensive processing hardware. Functionally, it's much like OSC's Deck II software-based editor for the Mac.

**STRENGTHS:** Eight channels on the PC, with real-time mixing and SMPTE lock to a MIDI sequencer and/or video.

**WEAKNESSES:** Region definition could rely less on on-screen buttons and more on simpler mouse or keyboard commands.

**PRICE:** SAW — \$599; SAW Utilities — \$349 **EQ FREE LIT. #: 184**

OK, OK...I admit it! I'm one of "those" guys who've been using the IBM/Windows platform to do their digital audio dirty work. Specifically, I've been using a Digital Audio Labs CardD (recently beefed up to a CardD+) and a Turtle Beach Multi-Sound card. It takes two computers and some down-home ingenuity to get any kind of multichannel versatility out of it, but the results are often surprising. I felt that I was pushing the PC to the max. That was, of course, before I got my hands on the latest version of the Software Audio Workshop (SAW) from Innovative Quality Software.

SAW is a software package that



SAW's main screen.



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



**AUTOMATE IT: \$49** Add MIDI fader/mute control of inputs, AUX returns and



**ALT 3/4 bus.** Works with dozens of popular

PC, Mac and Atari sequencers. Installs in any existing CR-1604 mixer or available built-in.

**COMBINE IT: \$229** Create a console with our Mixer

Mixer active combiner.

**FADE IT: \$75** Adjust master gain of up to 3 CR-1604s with our 100mm remote fader.

**EXPAND IT: \$199** Instead of 16 cheap microphone preamps, the CR-1604 has 6 studio-grade,

discrete lownoise, high-headroom preamps. If you need more, just add our XLR10 and get another 10. AH 16 will have incredible specs (-129.5 dBm E.I.N., 0.005% THD, 300K bandwidth) and performance so good that Neumann and AKG use CR-1604/XLR10 combinations to demo their most expensive microphones\*.

**ROTATE IT: \$25** Not shown: The RotoPod bracket. It rotates the CR-1604's jack panel onto the same plane as the mixer's controls. Cool huh?

Six AUX sends per channel, 3-band EQ at musically useful points, stereo solo in-place, constant power pan pots and extra ALT 3/4 stereo bus.

Sealed rotary potentiometers resist dust & liquid.

+12VAC BNC lamp connector.

The CR-1604 (\*1099\*) is the only compact mixer that can grow along with your budget & recording or live performance needs.

Built-in power supply.

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

**CONNECT IT: \$89.** Our CordPack (the bundles above the MixerMixer at left) contains 36 mono and 3 stereo low-oxygen, high fiber cables — everything you need to connect three CR-1604s & a MixerMixer. Best cable value on earth.

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

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

\*Mention Indicates use by Friends of Mackie endorsee, NOT specific endorsement by the artist, program, manufacturer or production company mentioned. An impressive list of famous Mackie users is included with your lit when you call toll-free.

Solid steel main chassis.

**32 CHANNELS!**

Via a 2nd CR-1604 & the MixerMixer.



Optional 100mm Remote Fader.

**48 CHANNELS!**

Via 3 CR-1604s & the MixerMixer.



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

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

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

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

\*Suggested retail price. Price is slightly higher in Canada. Price anywhere may vary by the phase of the moon or the price of cattle futures.

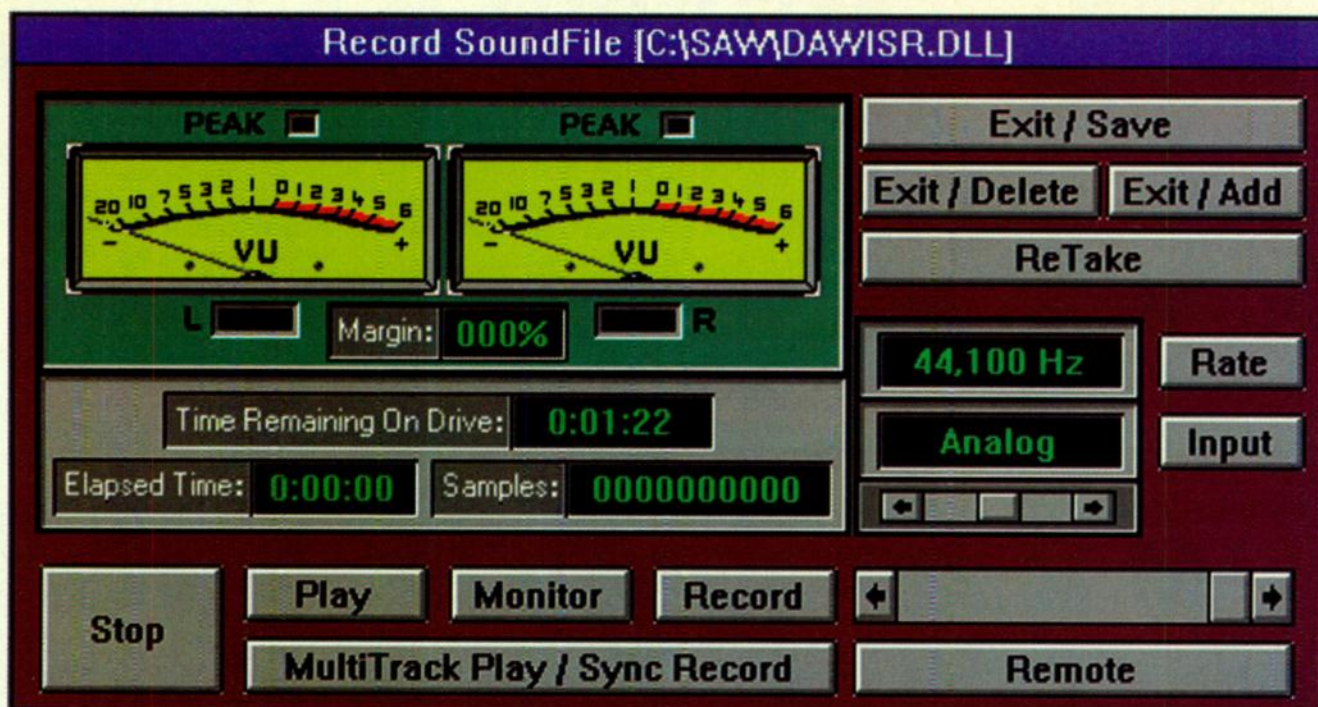
## MACKIE

20205 144TH Ave NE • Woodinville • WA • 98072 • 800/898-3211 • FAX 206/487-4337  
Outside the US, call 206/487-4333 • Represented in Canada by S.F. Marketing • 800/363-8855

CIRCLE 95 ON FREE INFO CARD

World Radio History





WINDOW WITH A VU (TWO OF 'EM): SAW's Record window.

will allow a 386/40 MHz or faster computer with at least 8 MB of RAM to mix up to four virtual stereo tracks down to the two outputs of an off-the-shelf multimedia card. That's eight tracks of digital audio on the IBM, folks! In addition, a window containing four on-screen faders lets you mix and process in real time the relative track volumes during playback. By adding a Music Quest MQX-32M MIDI/SMPTE interface, synchronization can also be easily implemented to achieve full multichannel SMPTE or MTC lock. (Music Quest, 1700 Alma Dr., Suite 330, Plano, TX 75075. Tel: 800-876-1376. List price: \$249.95.) In short, SAW translates into real, cost-effective power for electronic musicians who need acoustic tracks (and who doesn't?) for laying dialog, music, and effects to video, and for creating complex sound beds for multimedia or broadcast productions.

How can they do all this? Well, it seems that the program's code was written in a 32-bit-assembly language that runs entirely in the background of the Windows operating environment. For us nonhackers, this translates into on-the-fly screen drawing and processing speeds that couldn't possibly be handled by Windows without the help of additional (and often expensive) hardware. Interested? Let's take a closer look at the program.

#### DOING WINDOWS

The obvious starting point is the Record window. Once selected, this slick looking screen lets you select the sample rates and input sources that are available to your card. Also included are two fast-acting (and very cool looking) VU meters, the usual complement of transport buttons, and two other buttons that aren't so usual: the MultiTrack Play/Sync Record and the Remote Record buttons. The first is an overdub button that'll let you record onto a stereo track while listening to the previously recorded tracks in sync (this will only work if you're using a DAL CardD+ or a Turtle Beach Multi-Sound hardware card). The second button opens up a separate record window that will remain in the screen's foreground, even if you're currently working in another program. For example, the Remote Record window could be active while you're working within your MIDI sequencer, allowing you to punch soundfiles in and out of record while keeping track of your current measure position. In addition, a game port option can easily be wired up so that you can trigger record or playback by using a standard footswitch.

Once you've recorded a soundfile, the waveform will display in a Full View window (which will always display the entire currently selected soundfile), as well as in the larger Soundfile View window (which displays zoomable portions of the

soundfile for waveform selection and processing). This latter window plays an important part with SAW in that it is used to define a region, and the definition of regions is primarily what this program is all about. As with a number of popular programs, once a section of the waveform is marked, it can be defined and named. The named region will then automatically be placed into an EditList View window that is located in the screen's lower left-hand corner. These regions can then be dragged into a Play Sequence window, where they will be played back in sequential order...and now the game gets much more interesting.

It is at this point that the Multi-Track View window comes into play. This large window is used to display the editor's four stereo tracks. At the window's left-hand side are the track number displays and a series of buttons that lets you either actively select or mute a track. Defined regions are placed into a track by "adding" them into the track's playlist (Play Sequence window), and are then displayed in the track as a sequential series of named boxes. For example, I could select Track 1 to be active, place a number of regions into the playlist, press the playbar (or click the right mouse button), and listen to the results as the cursor scrolls over the region boxes. I could then select another track and place regions into that track, press the play button, and



# The New Star in your studio.



Studiomaster's Star System has gone straight to the top of the charts, with features and performance so good, you won't believe the price. Thirty-eight inputs and great sounding EQ are only two of the reasons why this unique mixing console is fast becoming a rising new star in the studio and on the road.

"Lateral Routing" dramatically improves the sonic characteristics by shortening signal paths and eliminating routing switches. By achieving better than digital specifications, the **Star System** is the perfect companion for ADAT, DA-88, Pro Tools and a host of other digital and analog recorders.

The **Star System's** stylish vertical design allows much easier access to all the controls. Making adjustments while at the keyboard is now a breeze.

For even more flexibility and control, simply plug in **Studiomaster's** exclusive audio processing modules. Add a stereo compressor, stereo gate, a parametric EQ, digital reverb or a digital delay to either of the front panel ports as you need them.

## Need Specs - Look Closer

Dynamic Range: 108dB  
T.R.D.: 0.0025%  
Signal to Noise: 92dB  
E.I.N. (mic. in): 129dB  
Frequency Response: 20Hz to 20kHz (+0/-0.5dB)

8 balanced mic/line + 8 tape/line + 10 stereo line + L/R buss in = **38 inputs**.

8 direct tape busses + assignable L/R buss with dual full parametric EQ.

3 band EQ on 8 main inputs, 2 band EQ on 4 of 10 stereo inputs. +4dBm/-10 dBV outs.

Inserts, channel mutes, input swap switching, dual 2 track tape facility.

Hi-fi inputs for CDs, DATs, cassettes + RIAA for turntables, etc. Fast LED metering. Buss mutes for tape and stereo line ins, PFL/SOLO in place, loudness button (for monitor and phones).

The Star System is made in England and can be yours for only \$1895.00 (MSRP).



## Studiomaster

Studiomaster, Inc. 3941 Mira Loma, Anaheim, CA 92807  
Phone (714) 524-2227, Fax (714) 524-5096

Studiomaster Group, Chaul End Lane, Luton LU4 8EZ  
Bedfordshire, England. Phone (0582) 570370, Fax (0582) 494343

Call or fax Studiomaster for a brochure on the Star System and for a dealer near you.

CIRCLE 96 ON FREE INFO CARD

World Radio History



COMING UP IN



NOVEMBER/  
DECEMBER 1994

### **SPECIAL AES ISSUE.**

If you're there, this issue will be your guide to what to see. If you're not, you'll see all that you missed. Check out our comprehensive coverage of this very important show. Also: Find out who made it into *EQ*'s impressive "People of the Year" list.

### **TWO NICHOLS TO RUB TOGETHER...**

Or whatever else you want to do with them. Roger Nichols does double duty with his report on the new Walter Becker album and his own distinctive look at those hot new Yamaha boards — the ProMix 01. Find out how Roger spent his summer and what the deal is with these momentous mixers.

### **THE GREAT ALBIN.**

The outspoken Steve Albini turns his attention toward phase relationships in another of *EQ*'s exclusive tell-it-like-it-is techniques.

### **TO BE A PART OF THIS MUST-READ ISSUE, CONTACT:**

Kathleen A. Mackay;

Associate Publisher (ext. 152)

Daniel A. Hernandez (ext. 150),

Matt Charles (ext. 147)

Andrea Berrie (ext. 148)

Christine Cali (ext. 155)

Advertising Sales

**TEL: 212-213-3444**

**FAX: 212-213-3484**

listen to the combined playback of both stereo tracks. This can go on until you've got simultaneous playback on all four stereo tracks. Zoom in/out buttons are also provided so that you can scale the window to your liking.

### **SOUND CONTROL**

Once the regions have been placed in a sequential order, they can be manually slipped in time to fit the necessary timings; or if the MIDI/SMPTE interface is present, the regions can be placed into their respective tracks so as to trigger at a specific timecode address.

As I mentioned earlier, each track can be varied in level by calling up the Mixer View window. Essentially, this four-fader mixer provides the interface for varying the level of each stereo track. Unlike other systems that don't have the extra coprocessing hardware, SAW's programming language is sophisticated enough that the IBM's own CPU can calculate the levels during playback in real time without rewriting the data that's on disk. Even though a fairly fast computer (such as a 486/50 MHz CPU model) is needed for the added computational overhead when volume changes are used on all four channels, this is truly an amazing feat.

When the Mixer View window is active, volume changes can be entered into the selected stereo tracks at the current cursor position by simply moving the track's fader to the desired level (over a -70 dB to +30 dB range). To change the levels at a new location along the track, just move the cursor to that position and select a new level setting. Fades can also be calculated on the fly by defining a waveform range and then calling up a fade. In this way, crossfades can be done without committing any changes to disk by overlapping regions and then fading one out while the sound on another track fades in.

Volume changes show up in the MultiTrack View window as a line that is drawn below each stereo track. Areas where there are no changes in level are drawn as a straight yellow

line, while positive gain changes appear as a bright green line and negative changes as a dark green line.

Processing functions, such as reverse, vari-pitch, and sample-rate conversion, are also included with the basic SAW package. However, for an additional \$349, a set of recently released signal processing utilities can be plugged into the existing program to give you a high-quality compressor/limiter; 64-bit resolution parametric graphic EQ (the best sounding digital EQ I've heard in a system); an effects module for adding delay and other such effects; a panning module for panning and cross-panning a signal between a stereo track pair; and a soundfile bit/rate conversion module.

### **I SYNC, THEREFORE I AM**

This software package offers a lot of power for a minimum investment. The computer I was using was a stock 486/50 MHz PC loaded with Passport's Master Tracks Pro, DAL's CardD+, two MQX-32M MIDI/SMPTE interfaces, and a stock video interface card (for on-screen video playback). Two MIDI/SMPTE interfaces were used because the MQX-32M's can handle SMPTE directly without the need to convert to MTC (which puts a processing strain on the Windows operating system). By assigning the first interface directly to SAW and the second to Windows (and thus the MIDI sequencer), sync was easily established. This means that for the cost of the software and about \$500 (list) for both interfaces, you can have MIDI and 4 stereo tracks of digital audio. Cool enough, but what I wasn't prepared for was that for the cost of a basic video interface board (about \$300), you can have MIDI, digital audio, and full-motion video on your computer screen, all happily locked to SMPTE. So for between \$1000 and \$2000 you can lock digital audio and MIDI to a time-encoded source for use with audio and audio-for-video production.

It was a little boggling to see an IBM perform these multitasks. Incidentally, SAW is currently being used





**FADER AWAY:** The SAW Mixer View window.

in the Las Vegas Hilton's hit show *Starlight Express*. The show's complex editlist of train effects and MIDI sound score locked to a video in a matter of seconds without a hitch from any point within the scene.

There's one more function that must be mentioned: SAW also includes an archive function that will let you back up and restore your entire session (named regions, volume changes and fades, editlists, etc.) to and from DAT tape, using either the digital or analog ports. Actually, this is done quite simply. Once an editlist file has been saved to disk (or diskette), the archive function will ask you to put a tape in your DAT machine and begin recording. The program will record a mark tone that will be followed by the audio recording of the relevant segments (with a four-second pause between each segment). This takes place in real time until the archive is complete. To recall the session at any time, all you need do is reload the archived data back onto disk, reload your editlist file (containing all names, fades and timing information) and you're back in biz.

Clearly, this program takes the IBM where we thought it couldn't go and is well worth the asking price of \$599. In addition, Bob Lentini (company owner and SAW's programmer) is hoping to have SAW Plus out by the end of this year. It'll offer up to 16 tracks of stereo or mono soundfile data for the IBM PC.

—David Miles Huber



You've just recorded a masterpiece on your cassette multitrack and you're ready for mixdown. But what can you do to eliminate that annoying hiss; while maintaining the punch, clarity and sparkle of your original tracks?

## BBE 362NR is the answer

Combining our patented Sonic Maximizer and single-ended noise reduction in one unit allows you to cut hiss, AND, restore high-frequency detail and bass "punch".

**BBE**  
Sound Inc.®

Audition one today!

5381 Production Drive • Huntington Beach, CA 92649

FAX 714-896-0736 • 714-897-6766

**CIRCLE 97 ON FREE INFO CARD**

## WhisperRoom<sup>INC.</sup>

SOUND ISOLATION ROOMS

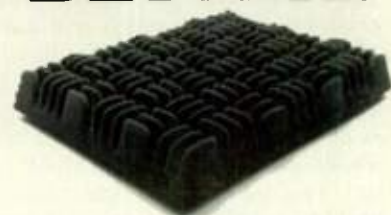


Recording • Rehearsal • Broadcasting  
Remote Capabilities • Audio for Video  
A/B Testing • R & D  
Assemble/Disassemble in Minutes  
Various Sizes • Expandable  
Choice of the Pro's!

Tel: (615) 585-5827 Fax: (615) 585-5831  
116 S. Sugar Hollow Rd. Morristown, TN 37813 USA

**CIRCLE 99 ON FREE INFO CARD**

## SONEX. 400% BETTER.



So unique, so advanced, so effective, SONEX is 400% better than other acoustical treatments. Find out why. Send for your free brochure.

**FREE BROCHURE!**

**illbruck**

Minneapolis, Minnesota

**1-800-662-0032**  
**(612) 520-3620**

**CIRCLE 98 ON FREE INFO CARD**



# MIDI AUTOMATION

*continued from page 58*

automation program specifically written for the Soundcraft Spirit Auto console. CM AUTOMation offers MIDICam that can be used with its own systems, but also templates for various hardware devices via plug-in software modules. Opcode is introducing a librarian module for Galaxy that will run the Yamaha ProMix 01, while its MAX software is a programming environment that can be set up to run any MIDI-compatible device. A really handy software feature to look for is grouping, which lets you group faders via software, just the way you might use a hardware fader group.

Owners of the Mackie CR-1604 will be happy to know that their consoles can be automated on any platform using software from CM AUTOMation (the aforementioned MIDICam for Macintosh), Twelve Tone Systems (Cakewalk Professional V3.0 for Windows), and Steinberg-Jones (Cubase Score 2.0 for Atari), as well as programs available from a host of other manufacturers.

## THE COMPUTER

Although you could conceivably use a hardware sequencer, plan to use a computer to run the automation because handling even simple mute on/off's can tax a microprocessor. Note on/off's might not seem like a lot of MIDI information, but there are several factors that can create MIDI logjam. The console may have as many as 32 channels, each of which will have a MIDI sequence track onto which the automation data will be recorded. This is a lot of MIDI data, and the computer may also need to chase tape while simultaneously executing MIDI control. Fast tempos will exacerbate the problem by giving the microprocessor less time to deal with each event. A computer with the speed of at least a 68030 or 386 processor would be preferred for use with 24 channels of automation while chasing tape. Experience has shown that with faster tempo songs, slower computers will glitch and won't consistently perform the mutes or fader moves exactly on time. This is especially true in song parts where many channels need to be muted simultaneously. When you add in the fact that there may also be virtual synth tracks, you can see the need for a powerful processor.

## THE MIDI INTERFACE

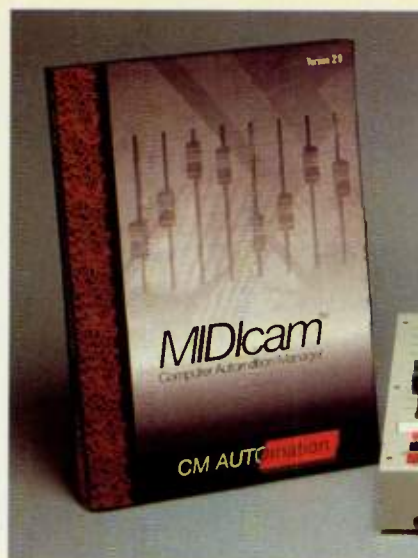
Macintosh and PC users will need a MIDI interface. Locking the computer to a tape machine will require some sort of sync, so look for an interface that is capable of generating and reading SMPTE timecode. For Mac users, the Mac Syncman from MIDIMAN is a cost-effective Mac/MIDI interface that reads and writes 24, 25, 30 drop, and 30 nondrop frame SMPTE timecode, and offers two MIDI inputs and six MIDI outputs. A supplied desk accessory allows use with System 6, while System 7 users can control the unit with a separate application (also included). The Mac Syncman carries a lifetime warranty and retails for only \$279.95.

If you plan to use a PC to run your automation system, an interface such as the MQX-32M from Music Quest can be fitted into any IBM-compatible that has a standard ISA or EISA expansion slot. For \$249.95, the MQX-32M includes full SMPTE support and two MIDI ins and outs, and can be used with Windows. Although Atari computers contain internal MIDI ports, you will still need a method of locking the computer to SMPTE code and converting that code to MIDI timecode. Steinberg-Jones offers the SMP II interface featuring four independent MIDI outputs (for a total of 64 MIDI channels) and two merged MIDI inputs. The rack-mount unit reads and writes SMPTE code and has an LED display that shows timecode location (suggested retail: \$1299).

There are some affordable (and of course many not-so-affordable) automated recording consoles available that do not require external computers. Most consoles with onboard automation are capable of storing data in "snapshot form," assigning MIDI program numbers to those snapshots and recalling them via MIDI program change or via a manual program number change.

The Allen and Heath GS3V (see review, April 1994 *EQ*) can lock directly to incoming SMPTE code, using its onboard memory to store mutes and fader snapshots.

For people who don't need mic inputs, there are MIDI-controllable line-level mixers available from Mark of the Unicorn (The MIDI Mixer 7), JLCopier (the Mixmaster), Niche (the ACM), and CM Automation (the MX-16). These devices have no controls on the front panels, so you must access each input via MIDI. You won't have control over equalization, but you will have automated panning with stereo models. This type of mixer is very useful for live or in-studio keyboard racks,



or can be used to run automated sends. To accomplish this you would connect the direct outputs of your console (or hardware interface) to the inputs of the mixer, and then route the output(s) to the effect device(s).

## THE BOTTOM LINE

When budgeting for add-on automation, don't forget to allow for the wiring. You will need cable harnesses (and connectors) to wire the hardware interface to your console and you might want to add another patchbay rather than hard-wiring the interface to your console. Audio purists will consider the patchbay a necessity since they won't want the audio signal unnecessarily passing through any additional circuitry (namely the VCAs) during the recording of basic tracks. The solution is to bring the insert send, VCA input, VCA output, and insert returns to the bay and patch around the VCAs when tracking. For mixdown, the patches are removed and the VCAs will be normalised into the path.

When you think about how much easier your life in the studio could be, automation makes a lot of sense. How many mixes have you blown because you missed one little fader move? Automation gives you the ability to fine tune mixes in a manner not possible through manual control. More important, you can store and then recall those mixes weeks or even months later. But the one thing that's really cool about having automation is that once you have the mix the way you think it should be, you can sit and listen to that mix without being distracted by having to move faders.

*The author wishes to thank Ken Paul at CM AUTOMation for his assistance in preparing this article.* **EQ**



**AUDIO SCHOOLS**



**Recording Engineer Training**

10-week Recording Engineer Programs  
Extensive Hands-on Training with  
the Latest Techniques and Equipment  
Job Training, Financial Aid and Housing  
Full- or Part-time Schedules

12268-HS Ventura Boulevard  
Studio City, CA 91604  
(818) 763-7400

Call for a Free  
Full-Color  
Catalog

**LOS ANGELES  
RECORDING  
WORKSHOP**

**HEAR THE FUTURE**



**BE A RECORDING ENGINEER**

Learn Recording and Mixing, Signal Processing, MIDI, Digital Audio and more. Intern at a top NY studio and benefit from lifetime job placement assistance. Ask about the special summer program for college students and the new VIDEO TECHNOLOGY PROGRAM.

**800-544-2501**  
NY, NJ, CONN 212-777-8550  
Lic. by NYS Education Dept / HS or GED Required  
App for Vet. Training / Financial Aid if Eligible

**Institute of Audio Research**  
64 University Place, Greenwich Village, New York, NY 10003

**MAINTENANCE SERVICES**

**DIGITAL CONTROL!**  
Stop nasty DAT overloads with our  
PL-2 Dual/Stereo Peak Limiter  
as seen in *Mix*, *EQ* and *Recording*  
Magazines. Contact your local retailer or  
**Rocksonics (714) 229-0840**

**JINGLE PRODUCTION**

**JINGLE PRODUCTION**

Would you like to learn how to make a fortune in  
the Jingle Business?

Call 1-800-459-9177 for a **FREE RECORDED  
MESSAGE 24 HOURS** and learn how. I'm a 17  
year veteran with Jingles in every state. My  
complete Jingle course shows you exactly how  
to do the same. Part-or-full time, locally-or-  
nationally. **CALL NOW** This information will  
save you years of trial and error. Make the  
money you want with your music today.

**POP FILTERS**

**The Studio POP Filter**

*A Great Improvement on a Good Ideal*



Open up the sound of your vocals  
and voice overs without annoying  
"POPS" ruining your best take!

- Standard mic stand  
adaptor with threaded  
brass insert

**IMPROVED**  
new double screen

ONE YEAR GUARANTEE

**Only  
\$2400**  
With optional  
Clamp and  
Gooseneck  
\$4495  
plus shipping



**AUDIO VISUAL ASSISTANCE**



565 Sherwood Road,  
Shoreview, MN 55126  
Phone: 612-481-9715







**LOUDSPEAKERS**

**SOLEN SPEAKER COMPONENTS**

**DAVIS** Acoustics  **DYNAUDIO** 

**AUDAX**  **vifa**  **ETON**

 **scan-speak** **seas** **CERATEC** 

**Peerless**  

**CROSSOVER COMPONENTS**

**FAST CAPACITORS**  
Metalized Polypropylene (Non-Polarized)  
Values from 1.0 mfd to 220 mfd  
Voltage Rating: 250 VDC, 150 VAC

**SOLEN INDUCTORS**  
Perfect Lay Hexagonal Winding Air Cored  
Values from 10 mH to 30 mH  
Wire Sizes from #20 AWG to #10 AWG

**HEPTALITE INDUCTORS**  
Seven Strands Litz-Wire Constructions  
Values from 10 mH to 30 mH  
Wire sizes from #16 AWG to #12 AWG

**SOLEN CROSSOVERS**  
Custom Computer Design  
Passive Crossover for Professional, Hi-Fi and  
Car Hi-Fi. Power up to 1000 Watt

**CROSSOVER SPEAKER PARTS**  
Gold Speaker Terminals, Gold Banana Plugs,  
Gold Binding Posts, Crossover Terminals,  
Power Resistors, Mylar Capacitors,  
Plastic Grill Fasteners, Nylon Tie-Wraps,  
Car Speaker Grills, Misc. Parts


**SOLEN INC.**  
4470 AVENUE THIBAUT  
ST-HUBERT, QC J3Y 7T9  
CANADA

Tél.: (514) 656-2759  
Fax: (514) 443-4949

Computer Aided Design for enclosure and crossover available to customer  
CATALOG \$6.00 REFUNDABLE

**NEW 1994 CATALOG**

**SAMPLES/LIBRARIES**

**ALL DRUMS**   
Best selling 2 CD set for Musicians, Film Producers, Recording  
Studios, Engineers, Songwriters, DJ's, Radio & TV stations.  
**2 CD SET - \$99 w/ S&H**

**ALL BRUNNEN** Complete recording of 100+ greatest songs  
sound bytes, jingle tracks, and song forms for all styles of  
music production and multimedia.

Call or write for a FREE E-catalog  
(407) 260-0070  
P.O. Box 5626 • Orlando, FL 32802

**DANCE SAMPLES**

New Jack • House • Rap • Techno  
Dance Construction Set CD • 1200 Samples and Loops \$75.00

Samples on 3.5" disk for: EPS, EPS 16,  
ASR-10, S-50, 550, 330, 770, W-30  
S-900, S-950, S-1000 & D-50 Ram.  
**CALL FOR YOUR FREE CATALOG!**  
**310 699-0095**

**MIDI MARK**  
P.O. BOX 217  
WHITTIER, CA 90608



**RELEASE YOUR OWN CD'S!**

500 CDs and  
500 Cassettes  
only **\$2,590**  
B&W inserts

• FREE Graphic Design • Ready In 3 Weeks  
• Major Label Quality • Money Back Guarantee

**DISC MAKERS**

1-800-468-9353  
Call today for our FREE  
full color catalog

Outside USA (215) 232-4140 • FAX (215) 236-7763

## SHORT CUTS

SO MUCH MUSIC-SO LITTLE TIME

length in minutes

• MAXELL MS CASSETTES	20	30	60	90'S
• SHAPE MARK 10 PRO	10	30	60	90'S
• TDK SM CASSETTES	10	20	30	60'S
• DAT TAPE - ALL BRANDS	10	15	20	30'S
• MAXELL XLII BULK CUSTOM LOADED	2-100	MIN		

• SUPPLIES : J-CARDS, LABELS, BOXES, etc  
• CALL OR WRITE FOR FREE CATALOG !

Ask about our  
**TELEPHONE ORDER SPECIALS !**  
Recording Supplies for the ENTERTAINMENT Industry!  
**SOLD NATIONALLY BY...**

**SONOCRAFT**  
520 MAIN STREET, BOONTON, NJ 07005  
Fax (201) 335-4562 ask for Ed Stern (800) 274-7666

**Audiomation**

**Compact Disc  
Cassette Manufacturing**

Call us before you order your CD's  
and Tapes, we will save you money.

**1-800-375-2060**

## DUPLICATION SERVICES

**REAL-TIME DUPLICATION**  
Brand new Sony decks, HX Pro, inserts, on-shell printing, shrinkwrap, Great service and the best prices around.

**CUSTOM LENGTH CASSETTES**  
The finest materials available, loaded to the length you need. Special pricing to duplicators.

**SoundSpace Inc. (513) 767-7353**

## CD's • CASSETTES • VIDEO

Real-Time Duplication on Nakamichi Decks  
State of the art High Speed Cassette Duplication • VHS  
Hi-Fi Duplication • Industry Standard Quality  
Printing/Packaging • Complete Graphic Design  
Services • Blank Tapes & Accessories • Low Prices

"Eastco - A Decade of Serving America and The World..."

**EASTCO PRO**  
AUDIO / VIDEO CORP.  
(800) 365-TAPE(8273)  
40 Gardenville Pkwy West  
Buffalo, NY 14224

Phone: (716) 656-1296  
Fax: (716) 656-1589

500 Chrome  
Cassettes & 1000  
Full-color  
inserts:  
\$795 Complete

1000 CD  
Package:  
\$1699

## CASSETTE DUPLICATION

HIGH QUALITY REAL TIME  
CASSETTE COPIES FROM YOUR MASTER  
All tapes CrO<sup>2</sup> High Bias Tape with mark X Shell

	1-99	100-199	200-299	300-499
C-10	1.65	1.45	1.35	1.25
C-20	1.70	1.50	1.40	1.30
C-30	1.80	1.60	1.50	1.40
C-40	1.85	1.65	1.55	1.45
C-50	1.90	1.70	1.60	1.50
C-60	2.10	1.90	1.80	1.70
C-90	2.25	2.20	2.10	2.00

All work guaranteed! Use above chart for pricing only.  
All tapes cut to exact length. Prices above includes Norelco hard shell box.

## PIERCE RECORDING

5836 NORTH 11TH ST. SUITE B. ARLINGTON, VA 22205 1-800-200-2629

## MAXELL XL II CHROME HIGH BIAS BULK

QTY	C-10	C-20	C-30	C-40	C-50	C-60	C-70	C-80	C-90
100	.37	.42	.48	.55	.62	.68	.80	.87	.96

## BASF CHROME SUPER HIGH BIAS BULK "CD QUALITY"

QTY	C-10	C-20	C-30	C-40	C-50	C-60	C-70	C-80	C-90
100	.42	.50	.59	.67	.73	.78	.90	.96	1.03

A MINIMUM OF 100 CASSETTES PER ORDER  
LENGTHS MAY BE COMBINED TO MEET MINIMUM  
ALSO AVAILABLE NORELCO AND SOFT POLY BOXES  
CASSETTE LABELS AND J CARDS IN WHITE & COLORS  
SHAPE MARK 10 SHELL AVAILABLE, ADD .10 EACH

WE CARRY A FULL PRODUCT LINE OF:

3M  
AMPEX  
BASF  
MAXELL  
PLASTIC REELS AND BOXES, ETC. **1-800-221-6578**

**CELEBRATING 27 YEARS!!**

**ANDOL**  
4213 14th AVENUE • BROOKLYN, NY 11219

VISA MASTER CARD AMEX DISCOVER

## CUSTOM MADE CD'S only \$75

- 63 Minute CDR
- Discounts for multiples
- FREE custom printed rear tray card
- FREE return shipping
- DAT 44.1KHz or cassette

call: **615-367-9242**

write: **Green Dot Audio**  
PO Box 290609  
Nashville, TN  
37229-0609

**SINGERS! REMOVE VOCALS!**  
**Unlimited Backgrounds™**

From Standard Records & CD's with the  
Thompson Vocal Eliminator™ Call for Free  
Catalog & Demo Record.

Phone: (404) 482-4189 Ext 28  
Singer's Supply, Dept. EQ-1  
7982 Hightower Trail  
Lithonia, GA 30058  
24 Hour Demo/Info Request  
Line (404) 482-2485 Ext 28  
Singer's Supply - We Have Anything & Everything For Singers

Factory Direct..  
Best Value!

**EURODISK LTD.**

**All Manufacturing  
In Our Plant!**

**SPECIALS •  
"With This Ad Only"**

**500 - Cassettes - \$715**  
(1,000 Cassettes - \$1,025)  
Retail Ready: FULL COLOR J-Card, Test  
Cassette, Graphics & Layout, Typesetting  
& Film, Cassette Label, Norelco Box &  
Shrink-Wrap (to 50 Min.)

**500 - 12" Vinyl - \$995**  
(1,000 12" Singles - \$1,450)  
Complete Package: Direct Metal Mastering,  
5 Test Pressings, Label Layout & Printing,  
Plastic Sleeve, Black or White Die-Cut Jacket,  
Shrink-Wrap (to 14 Min. per side)

**500 - Promo CD's - \$995**  
**Delivery in 15 Business Days!**  
Promotional Package Includes: CD-R  
Reference, One Color CD Label with Layout,  
Typesetting & Film (to 25 Min.)

**500 - Color CD's - \$1,995**  
(1,000 CD's \$2,265)  
Retail-Ready: FULL COLOR Front  
& Tray Card, 2-Color CD Label with  
Layout, Typesetting & Layout, Jewel Case  
& Shrink Wrap (to 58 Min.)

**Best Values In The Industry!**

Call For Our Complete Catalog

**EURODISK LTD.**

75 Varick Street, New York, NY 10013  
☎ (212) 226-4401 FAX (212) 966-0456

**Professional Tape &  
Communication Supply**

featuring  
**SONY**  
**PROFESSIONAL MEDIA**

VIDEO \* AUDIO \* DATA STORAGE  
ANALOG \* DIGITAL  
LOWPRICE GUARANTEE

...the most complete selection of magnetic  
tape products in the country.™

**800-950-8653**



## ACOUSTICAL TREATMENT

# BAD SOUND SUCKS.

LUCKILY FOR YOU, WE INVENTED  
THE WORLD'S BEST ACOUSTIC FOAM.

## Studiofoam™ Sound Absorbent Wedges

The industry's most absorbent foam! Uniform cut for clean & easy installation. Up to 60% more effective than other name-brand foams that can cost 5 times as much! Passes California firecode; is 48% more flame retardant than Sonex. Available in 1", 2", 4" & 12" (bass trap) sizes in sheets that measure 2'x4'. Long-lasting; doesn't crumble like other brands can. Superior shape retention. Wide range of colors. What Value!!!

1"-\$6.99 • 2"-\$9.99 • 4"-\$19.99

## Sonomat™ Convulsed Acoustic Foam

Cut in the industry-standard "eggcrate" shape. 4'x8' sheets, 2" thick, charcoal gray (other sizes & colors by special order; call for pricing). 85% as effective as Studiofoam Wedges, but still beats other brands that cost up to 5X as much! Made of the same stock, so it retains their advantages with regard to flame retardancy, longevity and shape retention. Order in pairs only. Unbeatable @ \$32.99 per sheet.

Clients: Dennis DeYoung (Sly), Kodak - The EPA - Warner Bros. Kaiser Medical Center • Mike Wanchic (John Mellencamp)

ALSO BASS TRAPS, BARRIERS & ADHESIVES  
Min. 1 Box • MC Visa Discover AmEx • No CODs

Call For Free Catalog & Sample Kit!

USAfoam • Box 20384 • Indianapolis IN 46220

**1-800-95-WEDGE**

# SALE! PLUS FREE ADHESIVE!

## MARKERFOAM™ ACOUSTIC FOAM GIANT 54" x 54"

Immediate Shipping

2" Reg. \$29.95 Now \$19.99 • 3" Reg. \$39.95 Now \$29.99! KILL NOISE QUICK!  
High performance, full-size sheets of super high density Markerfoam. EZ mount. Blue or gray. Super-effective sound absorption for studios. Markerfoam offers best value, looks professional & is proven in studios worldwide. Request Foam-Buyers Guide/Catalog, specs & free samples today. VISA, MC, AMEX, COD, PO's, QUANTITY DISCOUNTS.



**MARKERTEK JUMBO  
SOUND ABSORB BLANKETS**  
Heavy-duty 72"x80" padded blankets absorb sound wherever they're hung or draped. Fabulous for stage, studio & field use. Top professional quality at a super saver price! Weight: 6 lbs. Black, \$19.99.

## MARKERTEK BLADE TILES™

HIGH PERFORMANCE  
LOW, LOW COST!

\$3.49 per tile, 16x16x2". America's best acoustic tile value, only from Markertek! Charcoal. Also available 16x16x3" as shown, \$4.49 each.

**MARKERSTIK™** foam adhesive. FREE with any Foam purchase in this ad! Limited offer. A \$5.95 per tube value.



**SONEX**  
All the colors and sizes  
plus great prices!

**Get our FREE 149-page catalog  
of over 6,000 exclusive and  
hard-to-find supplies for audio & video.**

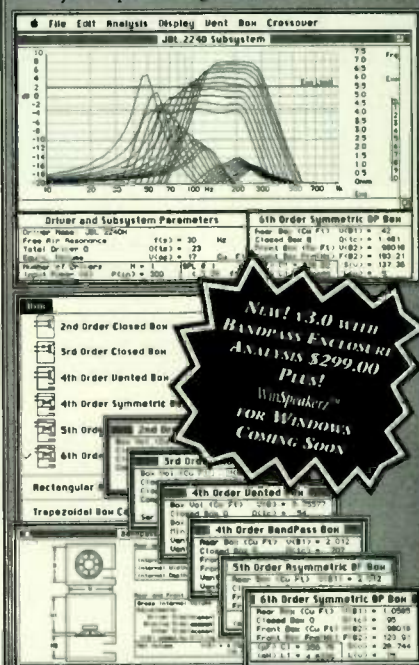
800-522-2025 America's most unique  
FAX: 914-246-1757 catalog for audio & video!

**MARKERTEK™**  
4 High St., Saugerties  
New York 12477 U.S.A.  
**VIDEO SUPPLY**

## LOUDSPEAKER SOFTWARE

# The Speaker Design Toolbox.

Friendly Loudspeaker Design Software for the Macintosh



Call for a Demo Disk today!

**MacSpeakerz** from True Image Audio  
349 WEST FELICITA AVE., STE. 122, ESCONDIDO, CA 92025  
PHONE 1-800-621-4411, FAX (619)-480-8961  
OUTSIDE THE U.S. PHONE/FAX 619-480-8961

## LA-2A LA-3A OWNERS

Before you by a new T4B optical attenuator, have it rebuilt at a fraction of the cost. Also stock OPTO's.

ANTHONY DEMARIA LABS

914-256-0032

## ACOUSTICAL PRODUCTS



**SILENT**  
Source

58 Nonotuck St., Northampton, MA 01060

Your Source for Acoustical Products

**BEST PRICES-NATIONAL DELIVERY**

800-464-1003 ext. 0032  
ORDER

MC/VISA Accepted

413-584-7944  
FAX OR INFO

# RUSSIAN DRAGON® TIMING ACCURACY METER



DRAGGIN'

RUSHIN'

**APPLICATIONS:** Enables you to sync triggered samples & tracks (.1 ms accuracy)  
Reveals MIDI timing problems; Shows how closely a drummer plays to a click;  
Checks sync of virtual tracks & tape tracks; Checks delayed loudspeakers.

**PURCHASERS:** Bob Clearmountain, Walter Afanasieff, Keith Cohen, Shane Keister, Ed Seay, Trevor Horn, Tom LordAlge, RJ Mutt Lange, Michael Boddicker, Roger Nichols, Bob Rock, Phil Ramone, Jeff Lorber, James Newton Howard, Oceanway, Paisley, A&M, Capitol, Ardent, Air...

**SALES:** 800.880.8776 **FAX:** 210.344.3299 Overnight Delivery Available  
**INFO:** 210.525.0719 Jeanius Electronics, 2815 Swandale, San Antonio, TX 78230

# STUDIO MIX

Studio Mix is custom software for Windows to help keep a permanent visual record of your recording or live equipment controls. Every Studio Mix is custom made for each individual setup. Macintosh version available soon.

For a fully working demo copy of software send \$5.00 to:

**StudioVisions**

8118 Holly Dr., Citrus Heights, CA 95610  
(916) 722-1979

# ADAT UPGRADES MIC MODS

Component level upgrades for mixing consoles, tape machines, mics, and all outboard gear. Also, high quality mic preamps. Step up to the 90's and hear what you've been missing at AES Booth #1729.

## AUDIO UPGRADES

6410 Matilija Ave.  
Van Nuys, CA. 91401  
(818) 780-1222 (818) 346-2308 FAX



## DUPLICATION SERVICES

# DAT to CD Mastering

for only  
**\$79.50 \***

CD LABS will put your music on CD Masters for the lowest price in the industry!

*Instead of a 1630 tape, we transfer your Dat to a Master CDR. Plays on any CD player & saves you hundreds of dollars.*

*Here's why we're the choice of studio professionals for mastering to CD, editing & quantity CD replication:*  
Same or next day service on Master CD  
Lowest Mastering Prices in the Industry  
EQ & Level Correction Service  
Every Disc Unconditionally Guaranteed  
Digital Editing and NoNoise™ Service

## SPECIAL DELUXE CD PACKAGES

1000 CD's w/4 page 4 color Inserts.....ONLY \$1975  
500 CD's w/4 page 4 color Inserts.....ONLY \$1495

## SPECIAL DELUXE CD/CASS. PACKAGES

500 ca.w/4 page 4 color Inserts.....ONLY \$2195  
1000 ea w/4 page 4 color Inserts.....ONLY \$2895  
Also available 500 or 1000 CD's \$995 & \$1150 respectively

THE ABOVE PRICES INCLUDE DAT TO CD MASTERING w/PG LOG SHEETS, CD & CASSETTE LABEL IMPRINTING, JEWEL BOXES & 2 FREE MASTER CD'S

\*2 Disc Minimum

**CD LABS**™

Direct to CD Mastering

12517 CHANDLER BLVD., STE. 107  
NO. HOLLYWOOD, CA. 91607  
(818) 505-9581--(800) 4 CD LABS



**ESP**  
**EASTERN STANDARD PRODUCTIONS, INC.**  
37 JOHN GLENN DR. BUFFALO, NY 14226  
(716) 691-7631 • FAX (716) 691-7732

**NEW CASSETTE & CD COMBO PACKAGES!**

CALL TOLL-FREE  
**1-800-527-9225**  
FOR A FREE BROCHURE



**J.P. ENTERPRISES**  
CD Manufacturing - Marketing & Consulting  
Radio and Retail Store Promotion - Fundraising

**WHAT IS Really Included In Your COMPLETE Package**

- \*Short - Cuts Sampler - Our *NEW* In-Store medium that knows who needs your product and when. Short-Cuts reaches radio stations targeted for your genre of music.
- \*Quick Turnaround
- \*Graphics & Film Production
- \*1630 or CDR Transfer
- \*Glass Mastering
- \*Booklet, Tray Card & J Card Printing

**Don't Choose Between Cost & Quality! Have Both!**  
If you are not completely satisfied with your current pricing CALL 800-270-3157 or fax us at (603) 532-4918.  
**WE'LL Match or Beat Any Price!**  
150 Peterborough St. Jaffrey, NH 03452



**Proto Sound**

LOW Prices!  
FREE Brochure!  
MAJOR Label Quality!  
FRIENDLY Customer Service!

**Compact Disc & Audio Cassette Production**  
(802)453-3334 FAX (802)453-3343

MASTERING • MANUFACTURING • PRINTING

# DIGI-ROM™

FOR COMPACT DISCS • CD-ROM  
REAL TIME & HI-SPEED AUDIO CASSETTES

COMPLETE PACKAGES • COMPETITIVE PRICING  
GRAPHIC DESIGN STUDIO • PERSONALIZED  
EXPERT SERVICE • FAST TURN-AROUND

**CALL HARRY HIRSCH**  
**(212) 730 2111**

130 WEST 42ND STREET • NEW YORK, NY 10036

## COMPACT DISCS/CASSETTES

<b>500 CASSETTES</b> <b>FULL COLOR</b> <b>\$755.00</b>	<b>COMPLETE PACKAGES</b> <b>NO HIDDEN COSTS!</b>	<b>500 CD's</b> <b>FULL COLOR</b> <b>\$1787</b>
--	---	---

REAL-TIME CASSETTES • HIGH-SPEED CASSETTES  
MACINTOSH BASED DIGITAL EDITING AND MASTERING

Free Brochure Whitewater Recording Since 1986  
9 Busbee View Road Asheville, NC 28803  
VISA 704-274-0956 MASTERCARD

## Φ Flux Audio/Video

Custom Made CD-R - starting at \$45  
Up to 74 minutes / Includes Postage  
Features FREE Color Tray Card  
and Insert / Any Source format  
**1-800-423-FLUX**

VINYL • CASSETTE & CD PRODUCTION • DESIGN/SEPS/PRINT

**Quality! 1-800-869-6561**

CALL FOR FREE CATALOGUE / CUSTOM QUOTE

INDIE EXPERTS • PACKAGE DEALS • QUICK TURN • DROP SHIPPING  
**ALIGNED AUDIO INCORPORATED**

**500 TAPES FOR ONLY \$1.16 EACH**

**BK & WHITE COMPLETE RETAIL READY PACKAGE**

For Two-Color Print add just \$.10  
Pure-Chrome tape add just \$.15

Main Street  
Waterville, ME 04901

**CALL FOR OUR FREE CATALOG!!**

**800-458-6405**

**KLARITY**

**KASSETTE**

**IT PAYS TO ADVERTISE IN EQ**

**3703 761910**

MASTERING	REPLICATION
PRINTING	TOTAL PACKAGING
	GRAPHIC DESIGN STUDIO
	POSTERS
	PERSONALIZED EXPERT SERVICE

**COMPLETE CD AND CASSETTE**

*The Power of Excellence™*  
**212-333-5953**

**330 WEST 58TH ST. NEW YORK, N.Y. 10019**

**PRODUCTION**



**DEALERS**



**BE A PART OF THE LEGEND AT MANNY'S MUSIC**

From Jimi Hendrix to Guns N' Roses, Manny's has been the first choice of legendary musicians for almost 60 years.

Experience the tradition of Manny's legendary service, expertise and extensive equipment selection.

Call 212/869-5172 or write for your FREE product catalog today and become part of THE LEGEND.

(Add \$2.00 shipping and handling outside Continental U.S.)

**Manny's Mailbox Music**

48th Street  
At Your Doorstep  
156 W. 48th Street  
NY, NY 10036

Hours 10:00 a.m. - 6:00 p.m. EST M-F

**USED GEAR BY MAIL**

THE CHEAPEST WAY TO OUTFIT YOUR ENTIRE BAND!

**Daddy's JUNKY MUSIC**

...when you're ready to rock!

**THE WORLDS LARGEST USED EQUIPMENT DEALER**

5 - 6 MILLION DOLLARS OF Used & New Guitars, Amps, Drums, Keyboards, Pro Audio Gear, Effects and MORE!

**MONEY BACK GUARANTEE!**

Now Offering A Huge Selection of **ROCK MEMORABILIA!**

Call or write today for your FREE catalog:

**Daddy's Junky Music**  
Used Gear By Mail  
P.O. Box 1018 EQ  
Salem, NH 03079

**CALL: 603-894-6492**  
**FAX 603-893-3517**

**MICROPHONE DEALER**

**RIBBON MICROPHONES**

Coles 4038 Ribbon Mics  
*The Best in the World*  
Sales - Service - Parts

Call Wes Dooley  
(818) 798-9128  
FAX (818) 798-2378  
1029 N. Allen Avenue  
Pasadena, CA 91104

**KEYBOARD SPECIALIST**

**ELECTRONIC KEYBOARD ACCESSORY SPECIALISTS**

WE SUPPORT ALL MAJOR BRANDS

**SCSI DRIVES**

SyQuest 44MB Removable	347
SyQuest 88MB Removable	494
SyQuest 200MB Removable	674
SyQuest 270MB 3.5" Remov	694
SyQuest 44RCD ROM Dual	847
270MB, 10ms, 3.5" Fixed	394
1080MB, 10ms, 3.5" Fixed	894

**RACK-MOUNT CASES AVAILABLE**

**HARD DRIVE SALES & REPAIR**

INFO or FREE CATALOG  
**619-789-6558**  
ORDERS 800-753-6558  
FAX 619-789-4170  
1125 ELEVENTH STREET  
RAMONA, CA 92065

**SOUND LOGIC**

**EXPANDERS**

AkaS950 & MPC60 RAM	174
Aikai MPC60 SCSI Interface	294
Aikai S1000/1100 8MB RAM	594
Ensoniq EPS-4X RAM	247
Ensoniq EPS16+ SCSI I/F	127
Ensoniq Sequencer Memory	157
Yamaha TX81Z 5X RAM	137
Yamaha MCD-64 RAM Card	87

ASR-10 S760 K2000  
SP SXII  
S770 RAM DPM3  
TS-10/12 SampleCell  
**FREE SHIPPING**

**USED EQUIPMENT DEALERS**

**Don't Get Beat**  
When you need equipment call

**8TH STREET MUSIC**

**(800) 878-8882**

Philadelphia's Largest Musical Instrument Dealer!!!

8th Street Music, 1023 Arch St.  
Philadelphia, PA 19107

**VINTAGE EXCHANGE**

**MIC HEAVEN**

Tube • Condenser • Vintage Mics  
Mic pre-amps • EQ's

NEUMANN • AKG • SCHOEPS  
NEVE • ANTHONY DeMARIA LABS  
API • MICROTECH GEFFEL

WANTED: USED & VINTAGE MICS: NEVE, API, TRIDENT MODULES

Call for "In Stock" Voice Message 201-656-3936 or Fax 201-963-4764

**MAINTENANCE SERVICES**

**DAT Recorder Service**

Fast expert, repairs on all DAT recorder brands and models.

Sony Authorized Warranty Service

**Pro Digital Inc. 215.328.6992**

**Alpha Productions, Inc.**

We repair microphones, amps, speakers.  
All makes, all models, all ages.

SHIP FOR FREE ESTIMATES

59 Madison Avenue Hempstead NY 11550-5418  
1-800-762-1586, In N.Y. (516) 489-3855 Fax 516-489-9364

**TO PLACE AN AD IN EQ, CALL**

**CHRISTINE CALI**

**AT**

**(212) 213-3444**

**EXT. 155**

**CARUSO MUSIC**

SAVE THOUSANDS OF DOLLARS  
BUYING YOUR NEW & USED  
EQUIPMENT FROM US

20 BANK STREET • NEW LONDON, CT 06320  
203.442.9600 • 203.442.0463 (FAX)



**DUPLICATION SERVICES**

**MUSIC VIDEO**

**100 CD'S for \$1,599**

From the Sonic System mastering to PMU, 2-color label film, 2-page brochure, 4 color front, 1 color back, 4 color inlay, all film seps & printing, replication & shrinkwrap to jewel case.

San Diego 619-267-0307  
1-800-828-6537 • FAX 619-267-1339



**Transfers To Compact Disc  
Starting at \$35**

**Digital RECORDING  
STUDIO**  
Phone: (800) 660-2499

**INDEPENDENT MUSICIANS**

Creative and Affordable  
Music Video Production  
with Proven Results  
**(205) 464-9336**  
CALL FOR DEMO

**JUST PRODUCTIONS**  
FULL-SERVICE PROFESSIONAL VIDEO  
1019 Old Monrovia Rd, Ste 891  
Huntsville, AL 35806

★ **a+r** ★

902 N. Industrial Blvd.  
Dallas, TX 75207

**214-741-2027**

TOLL FREE:

**1-800-527-3472**

★  
MANY OTHER  
PACKAGES AVAILABLE

VISA/MC ACCEPTED

*No Hidden Costs!*

Compact Discs - Cassettes - Records  
Great Package - Great Price

**2150.00 1000  
Compact Discs**

Sub & Glass Master - Typeset -  
Color Seps & Color Proof

2-Color - Label Film - 4-Color 2-Page Booklet with  
Black & White Back & Tray Card - Jewel Box with  
Shrink Wrap - UPS Standard Ground on Prepaid Orders

**COVERS/CASES & RACKS**

**OMNIRAX**

STUDIO FURNITURE for the discriminating musician



**800-332-3393**

P.O. BOX 1792 SAUSALITO, CA 94966

**A ② Z**

**212 346-0833**  
THE ONLY NUMBER YOU NEED FOR  
DESIGN AND MANUFACTURING

THE LEADING MANUFACTURING SERVICE FROM THE UK  
NOW IN THE UNITED STATES

**SUMMER SPECIAL OFFERS FOR  
CD'S & CASSETTES**

1,000 CD Albums • Glassmaster • Two Colour On Body  
Print • Four Page Booklet And Tray Card 4 X 1 Colour •  
Jewel Box • Shrink Wrap  
**\$1750**

(From CD Ready Master and Complete Printers Film)  
Running Master • Label Print • 1 Colour Print On Cassette  
Insert • Minicassette • Shrink Wrap  
**\$925**

(From Dual Or Tape And Complete Film)  
Full Type Setting And Design Service  
• All Editing And Packaging Requirements

A TO Z MUSIC SERVICES INC

105 DUANE STREET • SUITE 52B

TRIBECA TOWER • NY NY 10007

TELEPHONE (212) 346-0637/3

FAX (212) 346-0679

**ENSONIQ OWNERS:** Convert

Sequences to from Standard Midi Files  
on IBM-PC's. Each package TS10/12,  
ASR-10, EPS/EPS16, VFX-SD/SD-1,  
SQ-80, SQ-1/2/KS32, or KT-76 costs  
\$54.95. Convert SD-1 to TS-10 w/out  
SD1TS10 Conversion for \$54.95.

CALL FOR ALESIS, KAWAI, KORG,  
PIANO DISC, YAMAHA. VISA/MC.

**GIEBLER ENTERPRISES**

26 Crestview Dr., Phoenixville, PA 19460  
(610) 933-0332 Fax (610) 933-0395

Profitable! **DusKuvi**

**DUST COVERS**

Ask us about our  
risk-free inventory  
Exchange program!

• Premium quality vinyl  
• Black, clear or gray  
• Custom-fit sizes  
• Satisfaction GUARANTEED!

For  
keyboards  
...and more!

Call Us Today!  
(800) 472-7707

**j-pro**

P.O. Box 41  
Minneapolis, MN 55316  
(612) 427-7707 • Fax: 427-8865

**Anything Audio-Video**

**Cassette & CD Manufacturing**

CDR's • Any length Blank Cassettes  
Audio & Video Supplies

Any Size Orders • **Warehouse Prices**

Visa • Mastercard • Discover

800-483-8273 (800-483-TAPE)

Personal Service

**THE WAREHOUSE**

2071-2084 Emerson Street, Jacksonville, FL 32207 • 904-399-0424 • Fax: 904-398-9683

CALL US TO GET THE SAME EXPERT  
ADVICE, SERVICE AND PRICES THAT  
WE PROVIDE TO SOME OF THE WORLDS  
BIGGEST ARTISTS. CALL OR WRITE:

**R. I. MUSIC 96 BROAD ST.**

**PAWTUCKET, R.I. 02660 401-725-7829**

**Tailor-Fitted Covers**

**Keyboards • Mixers • Amps**

Choice of Colors • Fast Service

Free Brochure • Monthly Specials!

"One Size does not fit all"

Satisfied Customers since 1989

Call Our Workshop for Details at:

**1-800-228-DUST(3878)**

The Le Cover<sup>TM</sup> Co.

1223 Kingston • Schaumburg, IL 60193

**RR  
RIPCHORD  
RECORDS**

No Hidden Charges!  
Digital Editing!  
Free Samples!

**\$1400** 500 B&W CDs

**\$1650** 500 Color CDs

**(615) 558-8009**

**Custom Full Color**

**CASSETTE  
INSERTS**

**Complete Packages**

From **\$125** Includes FREE  
Typesetting &  
Design

Free Catalog

**1-800-955-5273**

24  
Hours

**ASG**

**1000 WATTS. 13 POUNDS**

More room in your rack and less pain in your back. Extremely  
compact and lightweight, 3.5" high, 19" wide, 7.5" deep and only  
13 pounds. Model 800-SR-4 power amplifier offers 275 watts  
/CH into 8 ohm speakers and 500 watts /CH into 4 ohm speakers.



Tomorrow's Digital Technology Today! In 2 or 3 years you  
won't feel that our amp is obsolete because of its size and weight.  
90% operating efficiency makes it small and light. AFFORD-  
ABLE, RELIABLE, HIGH QUALITY DIGITAL POWER, SAT-  
ISFACTION GUARANTEED: Sale \$ 595.00 List: \$ 1095.00

Since: 1986  
ELECTRO FORCE CORP.  
727 OAKSTONE WAY  
ANAHEIM, CA 92806

Call or write for more  
details & spec. sheets:  
(714) 774-3666  
(800) 227-4445



**PROFESSIONAL AUDIO SALES AND SERVICE**  
INSTALLATION \* CONSULTATION \* LEASING

**Studio Supply Company**

AKG AMEK/TAC API BEHRINGER B&K BRYSTON CANARE DDA DIGIDESIGN DOLBY-PRO DRAWMER EVENTIDE FOCUS  
RITE FOSTEX PRO GENELEC HAFLER JVC KKK LAFONT LEXICON MACKIE MIDDLE-ATLANTIC MILAB MILLENNIA MEDIA  
MICROTECH-GEFELL MOGAMI MRL NAKAMICHI NEUTRIK NTI OPTIFILE OTARI PRO-CD PRO-MONITOR RAINDIRK  
SONEX SONY PRO SPL STUDIO-TECHNOLOGIES SUMMIT-AUDIO TIMELINE TL-AUDIO TUBE-TECH UPTOWN-AUTOMATION

**FACTORY AUTHORIZED SERVICE**

AMEK/TAC DDA FOSTEX MACKIE MCI OTARI SOUNDCRAFT TASCAM TL-AUDIO

PHONE: (214) 358-0050

FAX: (214) 358-0947

9982 MONROE DR. SUITE 407  
DALLAS, TEXAS 75220

**ODYSSEY PRO SOUND**

SUPPLYING NEW AND USED QUALITY  
RECORDING EQUIPMENT

Competitive Prices Satisfaction guaranteed  
Consoles \*\*\* Tape Machines \*\*\* Outboard  
Microphones \*\*\* Vintage \*\*\* and MORE!  
We buy, list, and trade quality audio equipment.

**CALL FOR CURRENT LISTING**

Tel: (508) 744-2001 Fax: (508) 744-7224

MC/Visa Accepted

**AUDIO/VIDEO EQUIPMENT**

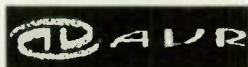
**Great Deals!**

Used Audio/Video/Musical  
Equipment. In Stock!

Top Brands like:

**Yamaha, JBL, Akai, E-mu,  
Sony, Panasonic, Tascam,  
DBX, Neumann, AKG**  
and many, many more!

**CALL-WRITE-FAX**  
for our Catalog Listing and  
**SAVE!**



**AUDIO VIDEO RESEARCH**  
the Boston area

**617 924-0660**

fax 617 924-0497

the Connecticut area

**203 289-9475**

fax 203 291-9760

**IT PAYS TO  
ADVERTISE IN**



**EQUIPMENT FOR SALE**

**HEY, MR. SOUNDMAN!**

**SHORT SOUND SYSTEMS  
STOCKS**

**Brand Name  
Sound Reinforcement  
Equipment**  
"Connectors To Consoles"  
**Large Inventory  
Fast Service  
Try Us!**

**SHORT SOUND SYSTEMS**

**306 Myoma Road  
Mars, PA 16046  
Phone 412-776-0095 (EDT)**

**PA - FACTORY DIRECT!!**

You can save hundreds by buying Quality PA  
direct from the Factory. Look at these prices:

	10' PAIR	Your Price
200 w 15" w Horn PA Enclosure	379.00 ea	180.00 ea
200 w 15" w Horn Floor Monitor	349.00 ea	175.00 ea
400 w 2-15" w Horn PA Enclosure	699.00 ea	320.00 ea

And these are just a few. Before you buy, call us!

**SB** TO ORDER CALL 1-214-228-9822 FAX ORDERS 1-800-454-9823 C.O.D.

**- Mr. Mike's Music -  
BUY, SELL, TRADE**

Roland TR505, \$125.00, TR 707,  
\$169.99, JUNO 106, \$349.00, JBL 4425  
Studio Monitors, \$850.00, Moog Multi  
Moog, \$475.00, Alesis SR 16, \$199.99.  
Ensoniq EPS 16Plus w/ Expander,  
\$1650.00. Rhodes MK80, \$975.00.

CALL FOR FREE PRICE LIST.

Mr. Mike's Music 816 A. East Main,  
Carbondale, IL 62901  
Ph(618)529-3444; Fax(618)457-6605

**EQ INSTANT ORDER FORM**

**CLASSIFIED:** ☐ For Sale ☐ For Rent ☐ Miscellaneous  
☐ Job Opportunities ☐ Vintage Exchange ☐ Situations Wanted  
☐ Duplication Services ☐ Equipment For Sale ☐ Books/Publications

\$80 per column - 1 inch minimum. 7 lines to the inch.

**MULTIPLE FREQUENCY DISCOUNTS AVAILABLE:**

Call Christine Call in the Classified Sales Department for more details.

Ads must be in display format (borders, logos, etc.) and submitted  
with camera-ready art. Screens (reds, yellow, or blue) 10% extra.

**ALL ADS MUST BE PREPAID**

☐ **CLASSIFIEDS/SERVICES**

(specify heading) \_\_\_\_\_

**PAYMENT:** Amount \$ \_\_\_\_\_ ☐ Check (enclosed) ☐ American Express ☐ VISA ☐ Mastercard

Card Number \_\_\_\_\_ Expiration Date \_\_\_\_\_ Signature \_\_\_\_\_

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

PHONE \_\_\_\_\_

Please supply camera ready art or ad copy on a separate sheet. Enclose copy, payment and this Instant Order  
Form and mail to: EQ Magazine • 2 Park Avenue • Ste. 1820 • New York, NY 10016. Attn: Christine Call.

TEL (212) 213-3444 ext.155 • FAX (212) 213-3484



# The Big Squeeze, Part 1

Compression threatens  
the way we musically  
live our lives

BY MARTIN POLON



In a previous column we pointed out the dangers of using space-reducing compression schemes all over the audio production chain, since successive passes through compression produce increasing levels of cumulative signal degradation. Many fear that the wideband space-needy PCM (pulse code modulation) technology of today's digital audio will be supplanted or replaced by the use of digital signal compression to accommodate space-limited disc storage, computer manipulation and transmission, and emerging consumer digital audio formats.

On the one hand, we see progress in improving the quality of the compact disc, and its unlimited fidelity, with 20-bit implementation. This has reached the point where existing recordings can be synthesized from 16-bit by the use of programmable DSP (digital signal processing) chips. Lessons on improving CD transport design have been learned from CD-ROM players.

It is also important to remember that uncorrectable CD errors are in a range so low that it can only be described mathematically as a theoretical  $10_{15}$ . Think of '10' followed by fifteen zeros. Correctable CD errors

are in the range of a  $10_5$  out of a theoretical  $10_7$ . Despite the fact that the CD system owes its genesis to research and development that is 15 years old at this point, the performance delivered by the CD is still no less than sensational, with virtually no limits to what can be stored and reproduced via the disc. The promise of 20-bit delivery means that the conventional CD will get even better.

Yet, flying in the face of the quality offered by the compact disc, we find some likelihood of space-limited recording systems that use compression and coding to remove portions of the audio signal. Professional and consumer DCC (digital compact cassette) and professional and consumer MD (MiniDisc) are formats that rely on compression in delivering digital sound.

What many in the professional audio industry fear is that today's recordings, if they are transformed from their humble analog origins in the human voice and acoustical instruments by digital signal analysis, processing, coding, companding, and compression, will resemble nothing so much as an electroacoustical chopped liver in which the original ingredients have disappeared from view forever!

One of the real pluses of digital technology and computer storage and manipulation in audio has been the ability to go back and extract the essence of current and earlier recordings marred by noise, hum, or analog distortions, restoring priceless performances from the analog domain.

Studio sessions circa 1958 done with RCA 77DX and 44BX microphones feeding an 8-input Collins 212S1 broadcast mixing console with a Cinema Products graphic equalizer and ending up on an Ampex 350 or 300 tape recorder, have, through to digital extrapolation, yielded extraordinarily listenable re-releases of many great artists such as Elvis and Fats Domino. Even more fascinating are the CDs released from master tapes made in Berlin during World War II using the original AEG-Magnetofone (the world's first practical audio tape recorder).

Clearly, making an argument against today's computerized data

reduction is not a simple matter, nor is it a blanket condemnation. Rather, it is a plea to studio operators to examine each element of the studio process and adopt new digital compression technology as needed to improve audio quality rather than to be solely technological "camp followers."

It is interesting to note, for example, that all three digital sound systems (DTS, SDDS, and SR-D) being used for theatrical exhibition of motion pictures such as *The Lion King*, *The Flintstones*, and *True Lies*, use moderate compression quite successfully. We are all aware of just how much progress has been made using compression techniques to transmit studio session audio between facilities that may be across the street or across the planet. Aerosmith, on the other hand, has opted via Geffen records to release a single off their new album via a compressed data package on CompuServe, the release can be downloaded on demand.

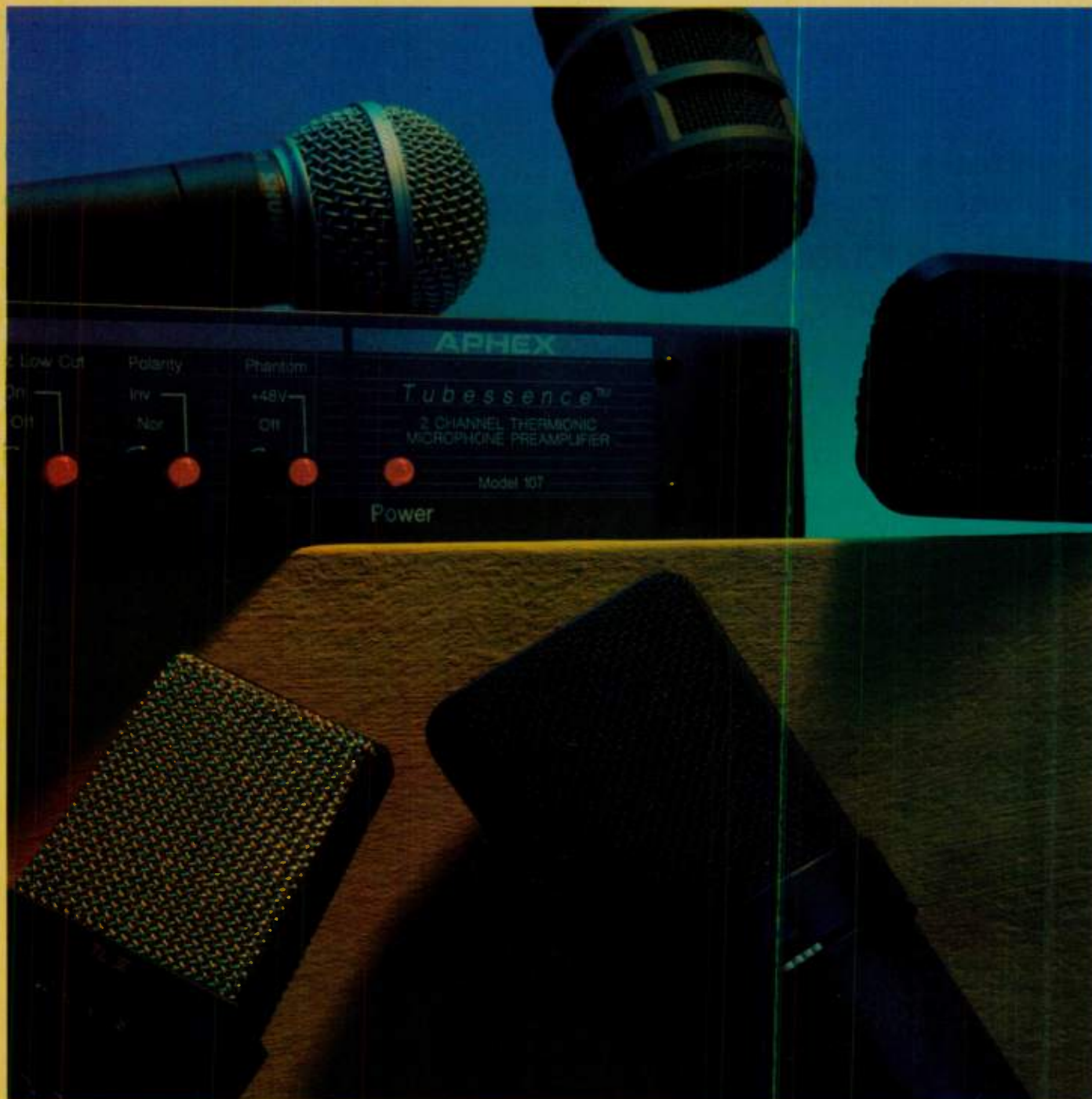
Current audio data reduction techniques have some merit if used judiciously and specifically to improve the flexibility of producing studio end product: recorded music, voice, and effects for release as records, TV, films, commercials, multimedia, and so on. We should, however, be using the most sophisticated tools at our disposal, ones with the highest sampling rate, the highest ratios of music data space to recording speed on the digitally recorded medium, the highest quality in components such as compression chips and software, the widest data buses, etc. Instead we find our industry considering taking one step forward and one step back with the use of space-limited recording storage and transmission systems that utilize compromised signal companding and low-bit-rate psychoacoustic encoding.

Next month, we shall examine the tools used for digital compression.

*Martin Polon is the principal of Boston-based Polon Research International (PRI). PRI forecasts the electronic entertainment industry for the financial community.*



# Upgrade all your microphones



Smooth and intimate, dimensional and detailed...is that the sound you're looking for? The Aphex 107 Tubessence® Thermionic Microphone Preamplifier reveals the subtlety and power in both vintage condensers and popular dynamic mics. Qualities that are lost on your console's mic preamp. **Tubessence, for the long journey from microphone to CD.**

The Aphex Model 107, tube mic pre - two channels of Tubessence for \$595.00 MSRP (U.S.).  
Call or fax for a dealer near you.

**APHEX**  
SYSTEMS

**Improving the way the world sounds<sup>SM</sup>**

11068 Randall Street, Sun Valley, CA 91352 • Tel: 818-767-2929, Fax: 818-767-2641

**CIRCLE 88 ON FREE INFO CARD**

World Radio History



# Smart and No Longer Dumb

Today's video games  
do more than just  
explode, shoot, and shock.  
They speak.

BY MURRAY ALLEN



**T**he sound designer for interactive games, in addition to possessing skills in the discipline of music composition, must also be knowledgeable about the recording of the human voice. Now that games are being published on CD-ROMs, there is enough data available to have the characters actually speak.

Originally, these spoken lines were just presented as subtitles. It is now possible to have these dialog lines actually spoken, giving the game another level of reality. The problem is that although there is enough data available to reproduce the human voice, there rarely is enough to do it right.

To begin with, we should understand a few things about the human voice. If you watch a spoken line on a real time analyzer, you will see that everybody has a different footprint relative to their frequency spectrum analysis. Talk show hostess Oprah Winfrey's voice has frequency components of up to 20 kHz, with a great

deal of energy at 8 kHz and 4 kHz. This is why her voice is both warm and very intelligible. There are elements common to everybody. The letters "J" and "S" have a great deal of energy around and above 5 kHz. So does the "TH" sound. With some voices this energy is closer to the 7 kHz area. This can cause a problem, which we will discuss later in this article.

The human voice also has a large dynamic range. In a given sentence a spoken line can have well over 20 dB of dynamic range.

## WHAT'S THE FREQUENCY

The first item to consider is the sampling frequency to be used for dialog, which is followed by consideration of the bit rate. Although we are used to recording and sampling voice at 44.1 kHz, 16-bit, in the world of DAT recorders, we might be required to sample this same voice at 11.025 kHz, 8-bit, so that it will fit on the CD-ROM. At 11.025 kHz the Nyquist frequency is about 5.5 kHz. This is the highest frequency that will receive two samples. In order to be reproduced, a frequency must receive at least two samples. It is now obvious that a voice that has its "J," "S," and "TH" sounds above 5.5 kHz will not have these sounds reproduced accurately. The end result will sound as if the speaker has a lisp.

When recording voices that will be ultimately sampled at 11.05 kHz, 8-bit, the following tricks will help in the reproduction process. While recording, have a brick wall filter available to place in the monitoring chain. During the recording session, listen to what the recorded voice sounds like with the frequency range cut at 5.5 kHz. If there is a serious problem, the actor or actress might be able to pitch his or her voice down a little to bring these problem sounds down into the acceptable range of frequencies. I like to use a high-quality de-esser in the monitoring chain. This will also serve as an early warning device.

Although condenser microphones are very popular for voice recording, if you are going to end up at the aforementioned low sampling

rate I would prefer a good ribbon mic. We can all learn from the engineers who had to work within the limitations of early radio and optical film recording. Both these disciplines had similar frequency limitations. Despite this, these engineers were always able to obtain a high degree of intelligibility. A good ribbon mic will produce a warm sound with smooth energies in the required frequency range. Why use a microphone that is going to provide you with frequencies that ultimately cannot be reproduced? (I bet I'll get several letters on this one.)

As an aside, if you have a choice between recording at 44.1 kHz and 48 kHz, choose 44.1 kHz. At this sampling frequency the sample rate conversion is more likely to be successful.

Now to dynamic range. When one samples at 11.025 kHz, 8-bit, the signal-to-noise ratio is about 48 dB. To those of us who work in the digital domain this seems almost sinful. However, those audio engineers who work in television have always had to work within a 54 dB signal-to-noise ratio, at best. The secret is to optimize the level without making this change apparent.

To accomplish this I like to use several limiter/compressors at various stages in the process. While recording, I like to use a device such as the dbx 160 set for a 4:1 compression ratio with a fast attack and release. At this stage, 5 dB of limiting/compression is about as far as I will go. When I transfer the audio into the sample rate converter I like to use the compression inherent in the Aphex Compellor, and will also use the Aphex Dominator to add some punch.

After the audio has been converted to 11.025 kHz, 8-bit, I like to use the L1 Ultramaximizer. This software will add another degree of normalization and 8-bit quantization.

Hopefully, by using some of the techniques mentioned, you will be able to produce respectable audio at low sampling rates.

My next column will address compression and decompression. **EQ**



# EQ

# THE EQUALIZER

**All studios aren't created EQual. That is, unless their operators read EQ — The EQualizer. The magazine that puts every studio on EQual footing. The magazine that inspires every studio operator with unEQualed technical chops and tip-top EQuipment techniques.**

**Subscribe to EQ at our special low introductory price and find out why project studio owners and platinum producer/engineers both consider it their most important guide to today's creative recording technologies. Build your EQuity in creative recording techniques by subscribing to EQ. The EQualizer.**

## SAVE UP TO 51% OFF NEWSSTAND

To become an EQual opportunity subscriber, just follow this EQuation (check one); Yes, I'd like to receive EQ ten times year at the rate of:

☐ 1 year = \$24.95 (10 issues)

☐ 2 years = \$39.95 (20 issues)

☐ 3 years = \$59.95 (30 issues)

Payment method:

☐ Bill me

☐ Check/Money Order

☐ Visa

☐ MC

☐ Amex

Card# \_\_\_\_\_ Expiration Date \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State/Prov \_\_\_\_\_ Zip/PC \_\_\_\_\_

Prices good in US only. Canada add \$10.00 per year for surface; other countries add \$15.00 per year for surface; all add \$30.00 per year for International air mail subscriptions. All non-US orders payable in US dollars by Visa, MC or Amex or international money order only. Allow 4-6 weeks for delivery of first issue.

Oct. 94



## SS THE BOARD

Continued from page 130

### DIGITAL AUDIO MATRIX

As you have probably figured out by now, I like to record onto many different formats when I mix. The most basic reason for doing this is because I can. The second reason is for data integrity. After using the Akai DD-1000 for a while, I discovered that all of the digital data went through the DSP and was altered before being stored on disk. If I had not been recording on an alternate format, all of my mixes would have been corrupt. I also found out that the Tascam DA-88 software revision 2.0 was not storing data properly and would not work with the Rane 20-bit conversion box I was using. I knew this in advance and made sure that the software revision in my DA-88 was 2.01 (where the problem was corrected).

Anyway, the reason I brought this up in the first place was that connecting all of this digital audio gear is usually a major nightmare. Recording and playing from three different formats is not so much of a problem. The big deal is when I have to copy something from one format to another. I usually have to get

behind the stack of digital doodads and start reconnecting cables. This only takes a few minutes, but putting things back the way they were before I started is another story. I usually have a cable left over that I know used to be connected to something. After a few minutes I just ignore the extra cable. Because of the high percentage of magic involved in digital audio, everything seems to work despite the missing cable.

I was talking to the people at Z Systems, which makes a sample rate converter that I like very much (plug). I suggested that someone should make an 8 x 8 matrix switcher for digital audio so that you could just plug everything in and forget about it. "Funny

you should mention it," they said. "We have not only an 8 x 8 box, but also a 16 x 16 box." I ordered one on the spot.

I got the box, plugged it in, and became the happiest digital audio guy on my block. Now when I need to make a DAT-to-CD copy while set up for mixing, all I have to do is push one button to reroute the digital audio signals to the proper places, and push it once more to get things back where they were before I started. Too cool. They are available in different flavors of AES-optical-S/PDIF to meet whatever your needs may be.

Well I guess that about does it for another month. If I live through this Steely Dan tour, I'll see you at the AES Show in San Francisco. **EQ**

### WE INTERRUPT THIS COLUMN...

Sign up now for the Roger Nichols 2-Day Intensive Master Recording Workshop, which will take place October 22 and 23 in Nashville, TN.

This seminar provides hands on experience in recording, mixing, and mastering for the digital age. The musicians involved will be the cream-of-the-crop and the sessions will be recorded at Masterfonics on the new Studer 48-track digital tape recorder with built-in noise shaping filters.

There is so much going on in these two days that we don't have the space to list it here. To find out more information and to get your reservations, contact Roger Nichols Workshop, 128 St. Andrews Dr., Franklin, TN 37064. Tel: 615-646-1309. Fax: 615-646-1951.

## Write or Call for FREE CATALOG

USA & Canada

1-800-331-3191

NYC Area: 516-678-4414

FAX: 516-678-8959

SHIPPED FROM STOCK

● PRICED RIGHT ●

IMMEDIATE DELIVERY



Distributors of **3M** Professional Audio & Video Products  
Including:

- |  |   |
|--|---|
| <input type="checkbox"/> ALL ANALOG & DIGITAL MASTERING TAPE | <input type="checkbox"/> ALL ACCESSORY ITEMS          |
| <input type="checkbox"/> ALL FORMATS OF A/V TAPE             | <input type="checkbox"/> REELS, BOXES & FLANGES       |
| <input type="checkbox"/> ALL HARD TO GET A/V PRODUCTS        | <input type="checkbox"/> LEADER & SPLICING TAPE, ETC. |
| <input type="checkbox"/> R-DATS & EVERY PACKAGED CASSETTE    | <input type="checkbox"/> LOGGING TAPE & MAG FILM      |

**Burlington** Audio / Video Tapes, Inc.

106 Mott Street • Oceanside, New York 11572





Apple Computer, Inc.

# THE NATIONAL MUSIC EXPO



## Boston

SEPTEMBER 10-11  
Hynes Convention Ctr.

## San Jose

NOVEMBER 5-6  
San Jose Convention Ctr.

## Dallas

DECEMBER 3-4  
Infomart

Sponsored in part by:

GuitarPlayer

KEYBOARD

BASS

EQ

MODERN  
DRUMMER

MUSICIAN

RECORDING

GAVIN

## Check Out The Gear

Check out the latest products from some of the biggest names in the music industry. Guitars, keyboards, drums, computer hardware and software, recording equipment and instructional materials—all on display and ready for you to play. Talk directly to the factory reps, clinicians, and product specialists. Meet endorsing artists and other industry notables. All under one roof at the Expo!

## Learn From The Best

Musicians Institute presents special workshops featuring instruction on guitar, bass, keyboards, drums, vocals and using computers for music and recording. In-depth master classes cover a wide range of styles and techniques from beginning to advanced. See up close how the industry's top players get it done. Ask questions, meet the players, and get the information you need.



**The Recording Workshops**—Sponsored by the Recording Institute of Technology, and taught by some of today's top studio engineers and educators, basic studio electronics and fundamentals of acoustics will be discussed with an emphasis on practical recording techniques for the home and commercial studio. Studio setup, miking, mixing, and tracking will all be included. See the very latest in high-tech digital tape and hard disk recording hardware and software.

FOR MORE INFORMATION CALL (415) 358-9500 EXT. 5703

Expo Tickets \$10\*

or

**Special 2-Day  
Workshop  
Package—\$25**

**Includes unlimited  
workshops and  
exhibit access**

Workshop seating is limited—  
first come, first-served.

Workshops conducted by:

**MI**  
MUSICIANS INSTITUTE

For exhibit information  
call Roger Mitchell at  
(214) 419-7862

\* Discount tickets available  
at participating dealers

**YAMAHA**

**EMAGIC**  
....we make computers groove.

**Fender**

**Ovation**

**PERCY**

Produced and managed by GPI EVENTS  
A division of MILLER FREEMAN, Inc.



411 Borel Avenue, Ste. 100, San Mateo, CA 94402  
(415) 358-9500 FAX (415) 358-9966



# Gear Slut to the Max



More stuff that will  
make your life soooo  
much easier. Trust me.

BY ROGER NICHOLS

**A**s I pen this little ditty, I am perched in the production office backstage at the Miami Arena for the third show in the '94 Steely Dan tour. This year's tour was designed to hit the population centers missed last year, including Florida, Canada, Seattle, Denver, and I think some place named Elephant's Breath, Montana.

We are recording all the shows this year just in case a Steely Dan live album should emerge. Don't hold your breath. The machine of choice is the Sony 3348 48-track digital recorder. The recording side of the chain is being done the same as last year: directly from the microphones, through mic preamps, without EQ, directly into the 48-track. But this year

I am monitoring the 48-track outputs differently. I got the first four Yamaha ProMix 01 digital boards in the U.S.A., linked them together, then popped them into a rack and ran them from a Mac powerbook. I won't spend too much time talking about them now because I am doing a full review of them for the November AES issue.

What I would like to talk about now is the program I used to run the ProMix 01's from the Mac. It is called Max and it is one of the many MIDI products from Opcode. Originally a nongraphical language intended to control IRCAM's powerful 4X synthesizer, Max was later implemented as a graphical environment for MIDI on the Macintosh.

When you work with Max, you develop applications graphically using objects. These objects appear on the screen as boxes that contain either text or icons. The boxes are then connected together to create a working program.

Let's say that you want to write a quick program to monitor control changes on your MIDI stream. First you place an object on your screen called "controlin," and then you place three boxes on your screen called "number." You then use the mouse to connect the three "number" boxes to the "controlin" box. That's all there is to it. You now tell the program to run, and the three number boxes show in real time the channel number, the controller number, and the controller value as they enter the MIDI interface.

To control a device via MIDI is just as simple. You place a slider on the screen and connect it to a box called "controlout." You place two "number" boxes on the screen and connect them to the "controlout" box. Run the program and type the channel and controller numbers in the "number" boxes. Now as you drag the slider around, the controller values will change to match the position of the slider. Pretty amazing, huh? This is the ultimate MIDI tool.

Anything that you want to do with MIDI can be done using Max. The big task for Max was to allow me to control the four ProMix 01's from a remote location. It took me five days to get up to speed on Max and the ProMix 01's. At the end of the fifth day, I had a Mac

PowerBook 180c screen filled with different-colored knobs and faders. Sixty-four faders for the audio mix, 64 faders for the effect sends, 64 faders for the pans, and enough buttons and LEDs to cause temporary dyslexia. I fired it up and it worked almost perfectly the first time. A little time fixing things, and I was ready to go.

Even if you don't think you need it, I guarantee you that after playing with Max for a few days, you will not know how you ever did anything without it. After you write that ultimate automated mixing program with Max, send me a copy and I'll review it for you.

## BIT BY BIT

Last month I talked about the new updated version of Sony's Super Bit Map (SBM) Processor. Well, it now seems as though it is pretty much a toss-up between the Sony SBM and the Apogee UV-22 process. There were some things that sounded a little better through the Apogee box, and some things that sounded a little better through the Sony. They both sound much better than straight 16-bit. If I were going to own one box for myself, I would probably choose the Apogee because of some of the extra features.

The UV-22 box will strip DC from the incoming data stream, which is nice if you are transferring tapes from a machine that doesn't strip DC before it stores it on tape. Sony F1, Sony 1610, and Mitsubishi tapes had that problem. There are very few boxes that can fix this condition. The UV-22 box also has a built-in input switcher that allows you to have multiple sources and destinations connected to the processor at the same time. When not using the processor portion of the UV-22, it makes a handy input router. If you are into cheating with your digital recording levels and there are lots of overs, then a button on the UV-22 will make all of the over indications go away. You will still have the clipped wave form, but the over lights on the digital meters will not come on. This usually makes the record companies, the mastering facility, and the CD pressing plant much happier.

*continued on page 128*



# HEAR THE FUTURE

**DIC'S NEW 8MM DIGITAL AUDIO CASSETTE  
IS DESIGNED FOR  
DIGITAL AUDIO MULTI-TRACK RECORDING!**



## **Split personality?..Not this cassette!**

It bridges the gap for Tascam DA-88 users who require a true digital audio cassette designed to deliver the highest levels of performance possible. Today's tape based digital 8 track recorders incorporate technology originally designed for video but that's where the similarity ends. Video technology compensates for the drop outs inherent in video cassettes but Digital Audio Multi-track Recorders require drop out free performance. **That's what DIC's new 8mm Digital Audio Cassette is all about... Digital Audio Multi-track Recording! No identity crisis here!**

### **DROP OUT FREE TECHNOLOGY:**

DIC's premium professional grade metal particle tape. 100% certified for critical applications where drop out free performance and high speed shuttling are required.

### **SPECIAL BACKCOATING:**

Specifically engineered for audio recording (totally different than mass produced video tape) engineers can shuttle the tape in during editing with confidence that the backcoating will not be shattered.

### **REALTIME LENGTHS:**

In realtime lengths of 15, 30, 60 and 120 minutes unlike a 120 video cassette that actually provides only 108 minutes of recording time.

### **Additional Audio/ Video Products:**

DAT cassettes • DAT drive cleaner • Optical discs • Recordable CD's  
• 4mm & 8mm data cartridges • 8mm video cassettes • SP Beta Products • plus more!

**MADE IN USA**

# **DIC//DIGITAL**

TM

***You'll hear the future..today!***

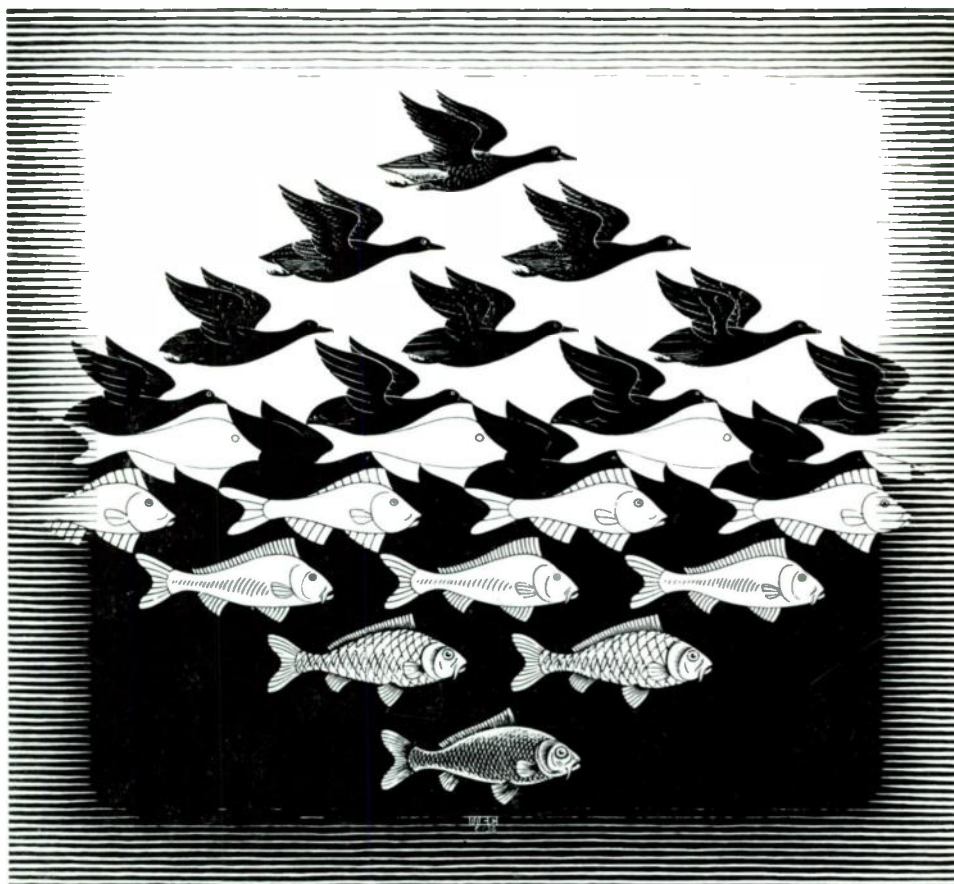
**CIRCLE 27 ON FREE INFO CARD**

**Glenpointe Centre West, 500 Frank Burr Blvd., Teaneck, NJ 07666.**

**Phone: 201-692-7700 or 1-800-328-1342, Fax: 201-692-7757**



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



© 1938 M.C. Escher / Cordon Art - Baarn - Holland - All Rights Reserved

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

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

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

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

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

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

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

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

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



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

**JBL**

JBL PROFESSIONAL, 8500 BALBOA BOULEVARD, NORTHRIDGE, CA 91329, PHONE (818)893-8411, FOR FAX INFORMATION, CALL (818)895-8190

H A Harman International Company