

JUNE 1993

EQ

THE PROJECT
RECORDING
& SOUND
MAGAZINE

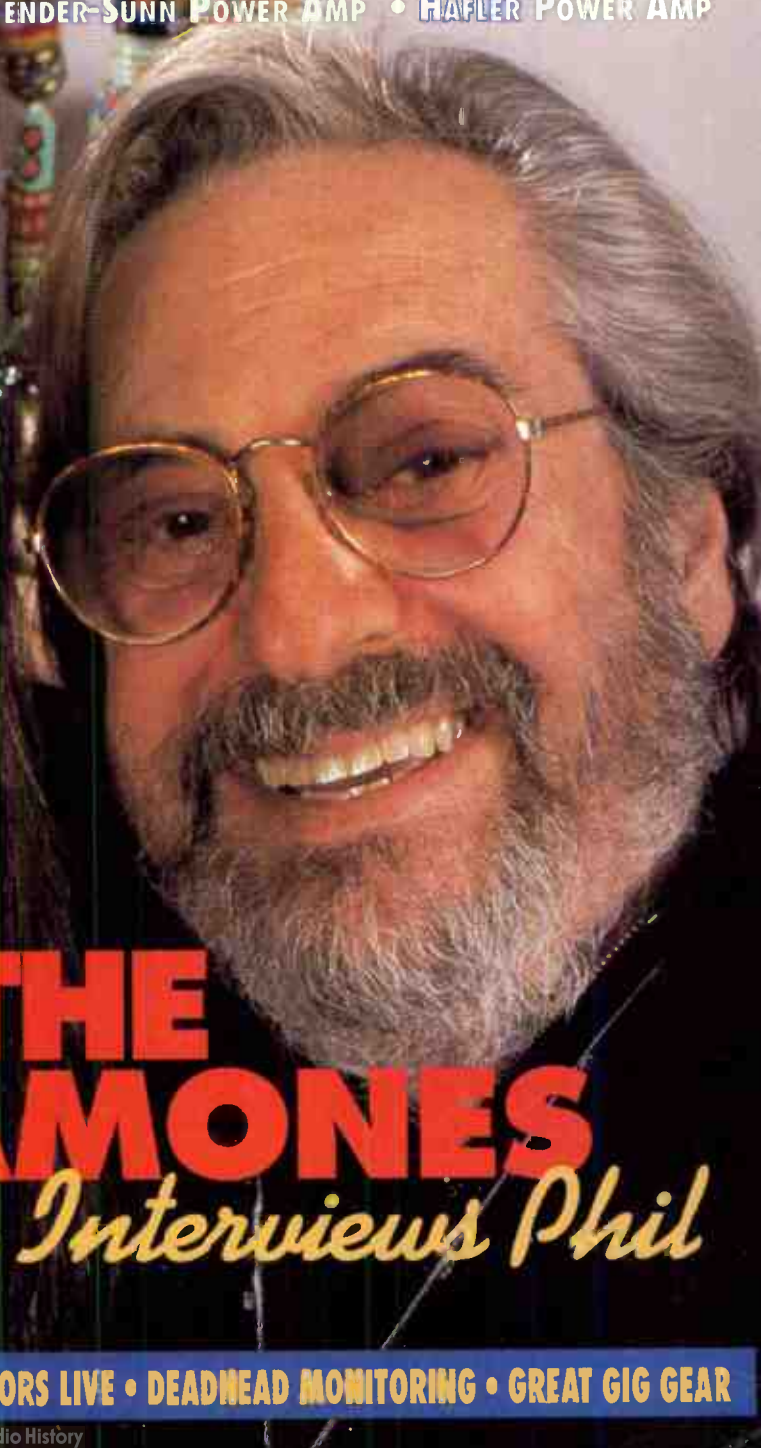


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CHUCK LEAVELL

PLUS
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**DEPECHE
MODE**

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VOLUME 4, ISSUE 3 • JUNE 1993



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JOEY & PHIL RAMONE: SEPARATED AT BIRTH

Punk legend Joey Ramone interviews super-producer Phil Ramone and discovers that they have more than a surname in common.52

IS YOUR FATE 8? By Craig Anderton

There's been plenty of talk about Digidesign's Session 8 since its debut at the last NAMM show. Find out if it holds up to its hype.60

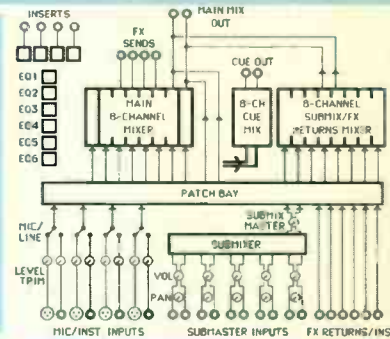


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On the cover: Joey & Phil Ramone by Peter Monroe; Chuck Leavell by Ken Krakow.



40-input
AMEK HENDRIX console at
September Sound, London



56-input
AMEK HENDRIX console
at B J G, London

Hear the amazing sound of HENDRIX on
WHITNEY HOUSTON's #1 worldwide smash
'I Will Always Love You' with vocals recorded
on location by the ARTISAN RECORDERS'
Hendrix-equipped Red Truck, March 1992

► **BUNK JUNK** and **GENIUS** Recording
is a unique and true reflection of
change within the recording industry.
The **HENDRIX** complements all of the
equipment and ideas that surround it
at B J G.

Our concept offers clients the latest in
computer-based technology for digital
recording and editing as well as MIDI
control over the fifty MIDI devices and
keyboards. This is coupled with
traditional analogue **DOLBY SR**
multitrack and digital multitrack, an
extensive array of not only the latest
effects, and a powerful outboard
ing system. All of this required a great
deal from a mixing console that has to
work with both MIDI and
live recording.

► The **Cortezu Twins** made many of
their significant recordings on an AMEK
ANGELA. I loved the Eq. When we
wanted to upgrade with a lot of
automation we went to the **HENDRIX**.
It was the obvious step. The sound of
this desk is just great. The compact size
and the number of facilities you get for
such a small footprint are amazing.
I'm totally satisfied."
Robin Guthrie, The Cortezu Twins

We chose AMEK HENDRIX because of
its ability to meet our requirements as
a highly-versatile console with,
most importantly, excellent sonic
performance and capabilities that
other consoles could not provide."
Paul Brewster, B J G

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IN THE UK

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4 FX Returns and 4 full-locally Stereo Line Inputs. AMEK VIRTUAL DYNAMICS and AMEK SUPERMOVE Moving Faders are options.

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CIRCLE 06 ON FREE INFO CARD



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LETTERS TO EQ

DIGITAL DECEPTIONS

I must say that I thoroughly enjoyed the verbal sparring between Mike Piehl of Philips Electronics and columnist Roger Nichols. I would like to throw my two cents into the "Nichols and Diming."

I would like to state at the beginning that I have not had the pleasure, or displeasure, of hearing a DCC machine yet. Maui tends to be a few months to a few years behind the curve in technology and to my knowledge, the island has not seen its first DCC unit. I will limit my comments to the "misleading semantics" and advertising, as well as to public perception of the DCC.

I have the privilege of working both as a salesman of consumer electronics and a freelance recording studio tech. People have been walking into my store since late last year inquiring about DCC, and without exception they have received misinformation about DCC's capabilities. Whether it is the fault of Philips or other companies supporting the DCC format, the public perception of DCC is that it is, indeed, 100 percent-compatible with the analog compact cassette. Consumers believe that they can play back DCC tapes on their home analog cassette decks with CD quality, and that playing an analog tape on a DCC machine will miraculously give them increased fidelity and reduced noise. If Philip's intent was not to give this impression, it should fire its advertising agency. The blame here also extends to the other companies supporting the DCC format.

I have had the opportunity to speak to a salesman of consumer electronics who was expecting his first DCC machine shortly (although not a Philips). He, too, claimed that there was 100 percent compatibility. How about offering a money back guarantee to consumers duped by confusing advertising or confused salesmen?

*Keola Donaghy
Wailuku, HI*

SIM-PL E MEASURING

I enjoyed the review of the SIM system (*EQ* Jan/Feb '93). It occurred to me, however, that there is another measurement tool that could have found the time delay between the direct gui-

tar and miked amp signals. I refer to the tape measure.

The delay could have been calculated by measuring the distance from the speaker to the microphone, and dividing by the speed of sound in air (1.13 ft/ms). Variation in the speed of sound is not likely to be a big error (unless you are measuring underwater). A SIM-measured delay of 1.48 ms implies that the distance between speaker and mic was 1.67 ft. How close is this estimate to the actual distance?

Distance estimates by tape measure are extremely linear, are not sensitive to voltage irregularities, can be made rapidly and precisely under most field conditions, and (in common with SIM) are independent of what kind of signal is played through the source. The price of the tape measure is approximately 10,000 times lower than SIM, suggesting that, for this application, it is a more cost-efficient alternative.

*Jim Fownes
Kaneohe, HI*

THE LAST WORD ON MADONNA

I am a student at The Recording Workshop in Chillicothe, OH. I am writing in response to the letter of criticism you printed from Steven K. Hornold of Lighthouse Recording, in the February issue, regarding the Shep Pettibone/Madonna article.




First and foremost, your job is to sell as many copies of your magazine as possible, as is the goal of all publications. By featuring an article on the recording of Madonna, you are appealing to a broader audience than you would, say, if you featured an article on the proper mixing of field mice. In fact, it was the image of Madonna that caught my eye, and resulted in an additional purchase for you guys. Job well done. But there is more at work here than just Madonna's photo. Certainly I don't buy a magazine solely because she is on the cover. If I did

WRITE TO US

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DON'T COMPROMISE.



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Microphone**



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CIRCLE 02 ON FREE INFO CARD

that, I would own thousands of issues of many different magazines that I would have no interest in reading.

I chose to purchase the "Recording Madonna" issue because of the Shep Pettibone article. I have admired Shep's work for many years but was never given any information about him or his technique.

I would very much appreciate it if you would continue to feature articles on successful mainstream producers and artists.

If Mr. Hornold wants to know the "how's and why's" of recording, he should further his education through textbooks. As for me, I read EQ to be entertained and enlightened, and I believe the majority of your readers hold the same conviction.

Patrick M. Korst
Chillicothe, OH

THE DEVIL MADE US DO IT

Re: April 1993 issue (Aerosmith)
First it was Madonna. Now it is rock musicians with sprouting horns (p.

56), recording studios at Sharon Tate's murder site (p. 32), and a four-letter obscenity on a tee shirt (p. 53). I only wanted to buy a magazine that talks about recording!

I am sorry I ever subscribed to your magazine. Not only Satan worshipers, rock 'n rollers, and the Bill Clinton generation read your magazine.

Steve West
New Castle, PA

TAPE THIS!

Wes Dooley did his homework on reviewing the new "hot tapes" (April 1993), but he didn't tell the whole story. On the page right before his review, Ampex suggests in its ad that 499 can be printed at +9 over 250 NW, Wes was testing everything at 250 NW. (Does anybody you know actually record at 250 without noise reduction?) What happens to these tapes at higher flux levels is another story. We learned that the hard way.

We use Studer A820 tape

machines with autoalignment. At +9 we found that 499 was down a full 2 dB at 16k (recorded at 30 ips). Since the Studers set themselves up at 16k, the machine compensated for the tape, but we were left with a 2.5 dB bump at 10k. This temporarily raised havoc at our studio when a producer took some tones from our studio to another studio, only to find that the 10k tone was pinning the meters. Sorting out this problem cost a lot of sweat and about \$3000 in downtime.

Wes' review would have been of more value had the rules on the back of the box been broken rather than adhered to, just as Ampex has done in their ad.

Todd R. Lockwood
Owner/Chief Engineer
White Crow Audio

SET THE RECORD STRAIGHT

I enjoyed Steven Tyler and Joe Perry's articles on the recording of *Get A Grip* in the April issue of EQ, although a major part of the recording process was left out of their descriptions.

How often have you wanted to bring out detail in a vocal without squashing the transients, or EQ'ing everything? Or reveal lost low-level harmonics in a track without upsetting the overall recorded level?

Now you can, with the Dolby Spectral Processor, a new two-channel dynamic equalizer.

Like a magnifying glass for sonic details, it allows you to boost low-level signals by as much

as 20 dB without affecting high-level signals. To get the right effect, you can adjust the processing threshold and amount of boost in each band, plus the crossover points between bands. And a gentle sliding-band noise reduction circuit is

included to reduce source noise revealed by the EQ section.

From adding that extra touch of presence to a vocal track to sweetening a final stereo mix, the Dolby Spectral Processor provides the kind of EQ you've always wanted. To arrange for a demonstration, contact Dolby for the name of the professional products dealer nearest you.



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Starting in April of '91, much of the first six months of work on *Get A Grip* took place at my studio, Rik Tinory Productions. During that time, a great number of 24-track tapes were recorded, as were over 100 DATs. While Aerosmith was recording, visits were made by Aerosmith producer Bruce Fairbairn, Geffen executive John Kalodner, writer Desmond Childs, and all others associated with the band. During Aerosmith's stay, they also recorded the audio for the band's segment on *The Simpsons* television show.

Aerosmith is a superb band. I met them at a nightclub in Revere, MA, in 1970. I had the opportunity to work with them during eight months of intense work on preproduction for the Grammy-winning album *Pump*. Since then, the band has become part of the studio and certainly part of rock 'n roll history. Rik Tinory Productions provided what the band needed — a private workplace away from interruptions, which is very crucial in the first stages of creativity.

The studio features a new Sony APR-24 24-track machine with internal timecodes, auto edit features, and all updates. It also has DAT-to-DAT cassette mixdown with real-time and high-speed duplication. There is also 1/2-inch and 1/4-inch Ampex recorders with dbx noise reduction, and a Soundcraft board.

One of the things that our clients like most is the selection of vintage toys loved by artists and producers. Among the wide selection are a Pultec EQP 1-A; UREI LA-3A limiters; vintage Altec Lansing speakers; a JBL 4411; and a Boston Acoustics HD-8. The mic collection features the RCA-77DX and the Neumann U47, U67, and U8. The standards are here as well, including EV RE-20; Sennheiser 441; AKG 112; and Shure SM-57 and SM-58.

The main room is 30'x50' and has three additional iso booths that are designed live, semi-live, and dead, respectively. Other valuable tools are a restored Steinway Model A grand piano; a Roland S-50 with 1100 sounds; a Korg M-1; and the original Linn drum with custom chips, lock sockets, and full MIDI capabilities.

I started out as a jazz drummer turned pop singer in the 1960's and

am also a songwriter with an extensive catalog — so I know the industry very well. And, although the studio is used by many big bands like Aerosmith, but we welcome both local and national artists.

Add this to the whole story as told by Joe and Steven in your April issue and you have the complete making of *Get A Grip*.

Rik Tinory
Rik Tinory Productions
Cohasset, MA

CORRECTION

The telephone number that can be used to order David Miles Huber's new book titled *Random Access Audio* (Sams Publishing, Indianapolis, IN) was incorrectly reported in the last issue's "Product Views" section. The book, which covers sampling and hard-disk technology, practical editing techniques, digital audio transmission, DSP, and MIDI can be ordered by calling Sams at 800-628-7360. **EQ**

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EQ&A

AMP-LE POWER

Q *I have a couple of QSC EX 4000's and EX 1600's in a biamped small club application. The EX 4000's are used to power my sub bins which are at 8 ohms each. My EX 1600's are for my horns. I am interested in running the EX 4000's in bridged mono mode to increase my power, but I do not want to take any unnecessary risks. Is this setup practical?*

*Mike Williams
San Francisco, CA*

A The EX 4000 will deliver 720 watts per channel into eight ohms in the stereo mode. With one EX 4000 alone, some would suggest that this is a substantial amount of power to drive low-frequency cabinets in a small club application.

However, yes, your setup is practical if you feel you really need additional power. If you do, you would do well to ensure that your speakers can take the power you're going to put through them. The EX 4000 will do about 2200 watts into an eight-ohm load in the bridged mono mode. With standard rock and roll types of pro-

gram material (frequent clipping), however, your speakers may see an average of about a third of this total power. You may need to adjust your amplifier's gain settings so that it's not delivering more power to your speakers than they can handle.

The advantages of using your amplifier in bridged mono are clear in terms of increased dynamic headroom capability. If you operate your amplifier in a continuous operating region lower than the maximum output, you will have an additional power-handling ability within your amplifier to reproduce sharp signal transients such as those from a bass drum. The reason for this is that the amplifier is not being used to its fullest extent, or at continuous peaking. If your amplifier were driven harder over a relatively long period of time, then the amount of "room" for your source signal to be accurately reproduced beyond this continuous level would be reduced.

Darrell Austin
Service Manager
QSC Audio

SAVE OUR SOUNDS

Q *I am a student with access to a Pro Tools, Sound Designer, etc., system on one hard drive. There's never enough disk space to save even the most simple change, which leaves the*

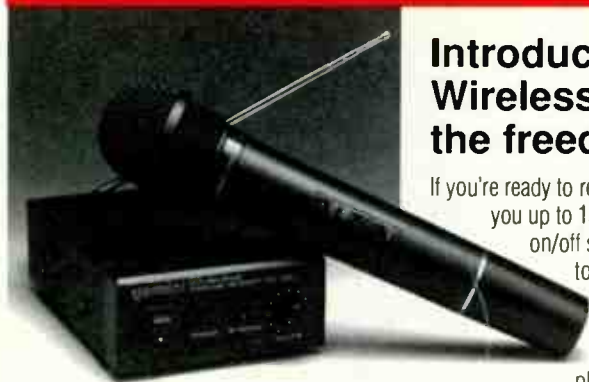
system virtually useless to me. How do I get around this without trashing other people's files?

Brian Kuhl
Asheville, NC

A When working with Pro Tools and Sound Tools, it's important to think about backup. At a rate of 5 MB per track minute recorded, a hard disk can fill up very quickly, especially when you're working on long multi-track projects. Buying more hard drives just to save information is simply not cost-effective, so you'll want to think seriously about different ways to back up your digital audio files. We recommend several options for backup, each with its own advantages in terms of price, capacity, flexibility, and speed. These include Digidesign DATa (with audio DAT recorder); Mezzo (from Grey Matter Response); optical drives; and computer DAT backup.

In terms of price, our DATa software program is a great archiving tool. DATa is sent free to all registered users of Pro Tools, Sound Tools, and Audiomedica II. This application will allow you to save all audio and editing parameters of a file on standard audio DAT recorders connected to your Digidesign digital interface. The main limitation of DATa is speed. All archiving is done in real time, one track at a time.

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Gain



MD 511/512



MD 515/516



MD 518



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MD 530



BF 1051



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CIRCLE 62 ON FREE INFO CARD
World Radio History





Grey Matter Response (Tel: 408-423-9351) has designed a very sophisticated archiving system called Mezzo — a combination of hardware and software that allows you to archive Pro Tools files in the background. While you are working with Pro Tools, all of your files are automatically being backed up onto Mezzo's data DAT drive. This is not only a cost-effective and fast archiving solution, but a great time-management tool as well.

Standard computer optical drives can be a very flexible medium, especially for archiving sound libraries that need to be quickly accessed. Unfortunately, the current crop of optical drives are not fast enough to perform direct multitrack recording. Lastly, computer data DAT mechanisms offer some nice software archiving management features, and speed.

Toby Richards
Product Manager
Digidesign

MINDING YOUR D'S & A'S

Q Who makes the Korg A-1 effects processor's Analog to Digital/Digital to Analog converters? Is it easy to replace them, especially at Digital to Analog?

James T. Derrig
Seattle, WA

A The A-1 has an AK5326 16-bit Analog to Digital Converter made by Asahi Kasei under license to Crystal Semiconductor. A direct replacement is the Crystal Semiconductor CS5326. Two Burr-Brown PCM56P 16-bit DACs are used. Several other versions of the Burr-Brown D-A converter are available and can be used with varying results. Please keep in mind that the A-1 circuit was designed to specifically use the AK5326 and the PCM56P, so any experimentation will likely degrade the audio signals. Also, before you rev up your toolkit, please remember that any service done outside an authorized Korg service center will void your warranty.

Randall Whitney
Signal Processing
Product Manager
Korg, USA

A QUESTION OF COMPATIBILITY

Q How would I go about concurrently running two Macintosh systems addressing the same set of synthesizers and digital effects? I have one Macintosh LC II for sequences (Southworth Music Systems MIDIPaint through a Jambox 4), and plan to add a Mac VX running MOTU's Digital Performer with its TimePiece II interface.

I have loads of MIDIPaint sequences and I like the software, so I would hate to discard this old stuff, but I need extra extensions and the extra screen space (having two monitors). Can MIDIPaint files be converted to Performer files, and will MIDIPaint and Jambox have problems with both System 7 and the VX (plus more problems, should I decide to add a 68040 CPU in place of the VX's 68030)?

Bjoern Arstad
Oslo, Norway

A First of all, I strongly recommend that you get rid of both MIDIPaint and the Jambox. The Jambox has always been quirky and MIDIPaint has been replaced by a plethora of great Macintosh sequencers (of which Performer is one). If you would like to keep the Jambox, though, there is salvation. Glen Workman and his company, FREQ Sound (410-964-3548), manufacture and sell a Jambox (Mac) software upgrade that allows it to run under System 7 along with a host of new features. A ROM upgrade is also available that brings it up to spec and allows it to work with the new software. Either one is only \$25 (including shipping and handling) and well worth the money. As for MIDIPaint (MP), I don't believe that it will run on the newer Macs, so you'll have to convert your files to Standard MIDI Files. MIDIPaint was discontinued before MIDI Files existed, but there's hope! FREQ Sound also offers a program called "One Step" (\$69), which lets you save MIDIPaint files as MIDI Files, therefore allowing Performer to open them.

As for your first question regarding integrating two Mac MIDI setups with one interface and one group of sound modules: You're on the right track with the MOTU MTP11. The MTP11 (as well as the original MTP)

will allow you to run two serial port cables into it; one from each Mac. You will then be able to access any synth in your setup from either Mac. There will be no cabling or reorganization necessary. I've set many clients up with a system like the one described and it worked really well. You can even add up to four MTPs if your setup grows to the point where it requires 32 MIDI modules and 512 MIDI channels!

David Frangioni
David Frangioni Enterprises

WAIT A SECK

Q I want to express my thanks to EQ for being a readable, understandable technical journal. I have an ADAT, and needed a console that would accommodate growth and/or virtual tracks, so I bought a SECK 1882 Mk II. Now I hear that SECK has been sold to JBL, and my console is no longer being made. Any clues on finding a user's manual?

Phil Madeira
Nashville, TN

A Harman International, the parent of JBL Professional, purchased the SECK product line in 1988. JBL Professional has continued to support the products with full customer service, parts, and documentation. A user manual can be obtained from JBL Professional Customer Service, 8370 Balboa Blvd., Northridge, CA 91329. Tel.: 818-893-8411.

The part number is SE 80M and the cost is \$5. A full Service Manual with schematics and test procedures is \$50 and has the part number SE 8SM.

David Kimm
Director-Electronics
Soundcraft Group

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

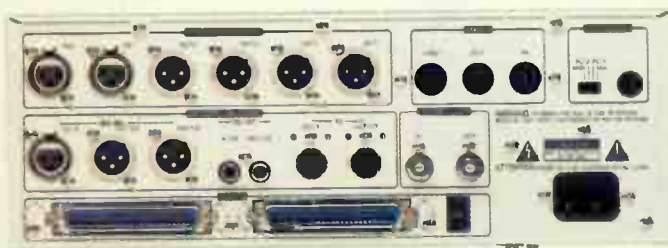
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If you're thinking about hard disk recording, you've probably heard that you'll need to buy a bigger, faster computer, with more slots and accelerators, that will end up costing you a whole bunch of money.

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The new Yamaha CBX-D5 Digital Recording Processor, developed in cooperation with premier hardware and software designers throughout the world, can be immediately interfaced with the most popular and affordable computers being used today. This impressive list includes Atari (ST, TT, and the new Falcon), Apple Macintosh (SE30, all II models, Quadras, and PowerBooks), IBM PS2, and even clones running Microsoft Windows 3.1.



detail of back panel

The CBX-D5 system was designed to let your computer compute and your storage devices store while the CBX-D5 handles the processor-intensive work. The CBX-D5 controls digital multi-track recording, analog-to-digital and digital-to-analog conversions, digital audio routing, digital signal processing and digital equalization, digital inputs and outputs in all standard formats, word clock synchronization, MIDI, and much more.



Cooperative design input from companies such as Mark of the Unicorn, DynaTek, and Steinberg made this all possible. The CBX-D5's modular format also provides a logical upgrade path with the ability to add more tracks, more storage, and more computing power without disrupting, scrapping, or obsoleting the rest of the system.

See the Yamaha CBX-D5 Digital Recording Processor in action at your local Yamaha Dealer or call 1-800-932-0001, extension 500 for more information.

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CIRCLE 75 ON FREE INFO CARD

The Serious

THE TASCAM DA-88 THE DIGITAL MULTITRACK DECK FOR SERIOUS PRODUCTION

It's true. The first machine designed specifically for low cost digital multitrack production is now available. And it comes to you from the world multitrack leader, TASCAM. It's simply the most advanced, well thought out and heavy duty digital 8-track deck you can buy. The best part is, it's incredibly affordable.

The DA-88 is built for production. The integrity of TASCAM's design is evident in every facet of the deck. From its look and feel — to its exceptional sound, unsurpassed features and expansion capability.

GOES FASTER, LASTS LONGER AND TAKES A BEATING

While we admit that it's an elegant looking machine, it's tough to see its finest asset. The tape transport. Designed and manufactured by TASCAM specifically for the DA-88, it's fast, accurate and solid. And that's what counts in production — in personal studios, project studios or in those demanding high-end facilities.

You'll notice it uses superior Hi 8mm tape, giving you a full 108 minutes of record time. What's more,

the transport is lightning fast and yet so quiet you'll barely hear it blaze through a tape.

We didn't stop there. Because production environments are notorious for constant, if not abusive, shuttling, punching, 24-hour operation — you get the idea — the transport was designed and built to take a beating.

Even more impressive is the transport's responsiveness. Take a look at the front panel. Notice the shuttle wheel? Turn it just a bit and the tape moves at one fourth the normal play speed. Turn it all the way and it flies at 8 times faster. Do it all night if you want. It's quick, smooth and it's precise. Need to get to a location quickly? Accurately? Shuttle a bit and you're there. The location is easily viewed on the DA-88's 8-digit absolute time display — in hours, minutes, seconds and frames. With the optional SY-88 sync card it displays timecode and offset, too.

YOU ALREADY KNOW HOW TO OPERATE IT

Unlike other digital multitrack decks, the DA-88 works logically and is simple to operate. Like your analog deck. All functions are familiar and easily operated from the front of the deck.



Adding the optional SY-88 synchronizer card is as easy as changing a Nintendo™ cartridge. With it you're SMPTE and MIDI compatible. And no matter how many DA-88s you have locked up, you need only one sync card. Other optional accessories include AES/EBU and SDIF2 digital interfaces allowing the digital audio signal to be converted for direct-digital interfacing with digital consoles, signal processors and recording equipment.

s Machine



Take punching-in and out, for example. You have three easy ways to do it. You can punch-in and out of single tracks on the fly. Just hit the track button at the punch-in point. Hit it again to punch-out. You can use the optional foot switch if you like.

Or, for multiple tracks, simply select the track numbers you want to punch, push play, and when you're ready, hit record to punch-in, play to punch-out.

Finally, for those frame accurate punch-ins, you've got auto punch-in and out. In this mode you can rehearse your part prior to committing it to tape.

No matter which way you choose, your punch-in and out is seamless and glitch free due to TASCAM's sophisticated variable digital crossfade technology.

That's not all, you also can set your pitch ($\pm 6\%$), sample rates (44.1 or 48K), as well as crossfade and track delay times. All from the front of the DA-88.

COMPLETE SYNCHRONICITY

There's more. Add the optional SY-88 synchronizer card to just one of your DA-88s and you've got full SMPTE/EBU chase synchronization. The best part is, you can record time-code without sacrificing one of your audio tracks. You also get video sync input, an RS-422 port to allow control of the DA-88 from a video editor, and MIDI ports for MIDI machine control.

A DIGITAL RECORDING SYSTEM THAT GROWS WITH YOU

The DA-88 is truly part of a digital recording system. Start with 8 tracks today — add more tomorrow.

Adding tracks is as simple as adding machines — up to 16 for a total of 128 tracks. They interconnect with one simple cable, and no matter how many DA-88s you have, they'll all lock up in less than 2 seconds.

Controlling multiple machines is made simple with the optional RC-848 remote. With it you can auto locate and catch 99 cue points on the fly. It comes complete with shuttle wheel, jog dial, RS-422 and parallel ports, and it controls other digital and analog machines, too.

LISTEN TO THE REST

Of course, the sound quality is stunning. With a flat frequency response from 20Hz to 20kHz and dynamic range greater than 92dB, it delivers the performance you expect in digital recording.

So get to your authorized TASCAM dealer now. Check it out. Touch it. And listen to it. Once you do you'll know why the TASCAM DA-88 is the serious machine for digital production. The TASCAM DA-88 is the choice of studios worldwide. And at only \$4,499, it should be your choice.



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EDITED BY DAVE BRODY

THE EMERGENCY RESHAPER

If you find yourself stuck needing to transfer SMPTE timecode from one tape machine to another and there's just no way to get your hands on a proper reshaper, you may be able to borrow an old trick from the days of quadruplex video machines and the brave men who rode them. They reshaped their timecode the old fashioned way: they clipped it. The theory was that a funky second- or third-generation timecode waveform could be squared off by overdriving the level to the input stages of the tape machine or even to the reader after the fact. The caveat is that there's a fine line between the level at which the waveform resquares and that at which harmonic distortion produces pulsewave-crud, which the reader thinks may be code information.

You can even do this when recording code to DAT or other digital formats, but you must clip the waveform with an analog external device before the input to the digital machine. Bottom line: Don't do this unless you absolutely have to — but it could save your butt.

THE SOURCE OF ALL SYNC

If you're involved with shooting a music video (or any other visual production that requires audio/picture sync), you can save yourself, and the production, infinite hassles by choosing a single sync generator to be your sole source of sync for the duration of the project. Carry it with you from day one — right through the final postproduction. Resolve any resolvable machine in the chain to it. You should probably invest in a portable unit. These are battery powerable and can be had for a couple of hundred dollars or less. And they'll pay for themselves in just a few hours of saved studio time.

Whatever you do, *do not* trust the frequency of the line voltage that your

local power company spits out of the wall socket at you as a source of sync. The only spec it's under is to provide you with 5,184,000 sinewave cycles per 24-hour period. And it usually "balances its books" between 11 PM and midnight — in other words, just when you're mixing the audio master. You'll probably be shooting the video during the day. So sync to line frequency? I don't think so.

BETTER LATE THAN STUPID

Never forget that your music is being made to be heard by humans (for now, at least). Different sounds will hit the listener in different ways. So "delay for feel" can be a valuable creative tool. Unless you're only doing hardcore Techno/Rave (and perhaps even then), you may want to try purposely delaying (or pulling up) certain sounds — particularly within the drum kit. Try making the hat a little lazy; or perhaps, lay every other hit of the snare on the fat side of the beat. Chord pads that speak late can add sex appeal to a ballad. And so forth. Use the technology to expand your creative expression rather than to constrict it. It's a Zen thing.

With all but the most expensive digital delay units, it's best to try and delay the trigger signal to the sampler or synthesizer rather than its audio output (although you may get some interesting colorations if you put the DDL in the audio line). Historical note: Recording artist Donald Fagen along with maestro-engineer (and EQ magazine contributing editor) Roger Nichols are usually acknowledged as the pioneers of this technique. Pretty good company to be in, no? **EQ**

A Tip in Time Saves Whine
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22. It works great with my bass rig
23. My flute sounds better through it
24. 20Hz to 20kHz Bandwidth
25. 127 MIDI sources can modulate any of 57 parameters
26. Works great in any country
27. You can take it on cruise ships
28. Everybody in Hollywood thinks it's cool
29. They use it back East
30. They use it out West
31. The North and South think it's great
32. Affordable enough for demos
33. Perfect for masters
34. It will be with you throughout your career
35. Those cute buttons with the little lights
36. Pressure sensitive programming buttons!!
37. The chorus is unreal
38. Reverb + chorus Programs are awesome
39. Pro engineers can't believe it's so inexpensive
40. They've got one in every room where I rehearse
41. I need one in my rack and one at home
42. The vocals stunk until I added the Quadraverb
43. Instant vocal doubling + chorus + reverb + eq
44. My guitar finally has a voice
45. 20 Bit processing
46. Incredible resolution for perfect reverb tails
47. It sings
48. Fills in the cracks of my keyboard
49. It's like a synthesizer for processing
50. There's no better reverb
51. The multitaps are unbelievable
52. You can delay up to 1.5 seconds
53. With everything on, there's still 800ms of delay
54. The price is unbelievable
55. All Alesis reverbs are great
56. It makes my drum machine sound real
57. It was the finishing touch on my demo
58. ...and my demo got me a deal
59. It's great to borrow, but better to own
60. Late at night under headphones I leave the planet
61. My mixes sound like movies
62. My speakers sound bigger
63. Close your eyes and you're there
64. For a successful music career
65. For birthdays
66. For Christmas
67. The auto-panner is great
68. Michelangelo would have used one
69. It gives me new keyboard sounds for free
70. It's so musical sounding
71. It's as wet as you can get
72. Use as much as you like
73. The resonators are great for guitar
74. The ring modulators are great for sci-fi
75. The sampling is a cool convenience
76. You can automate parts of your mix
77. It's a necessity
78. The specs are great
79. It makes my ears feel better
80. It makes A & R departments hear better
81. I'd be lost without it
82. I don't need it at the beach...but I might
83. It's the first thing ON in my studio
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85. I love Alesis
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87. It does 24 million instructions per second
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92. It only weighs 4.5 pounds
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99. It looks great in a rack
100. It's the all-time classic reverb

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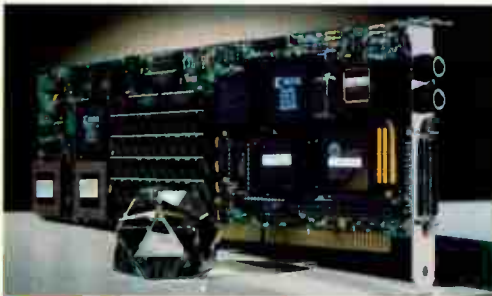


CIRCLE 94 ON FREE INFO CARD

EQ PRODUCT VIEWS

UP FRONT

John Hardy's M-1 mic preamp provides performance that is superior to the world's most expensive consoles, the manufacturer says. It's built with the top-of-the-line Jensen JT-16-B input transformer, 990A-24V discrete op-amp, and DC servo circuitry with input bias current compensation. The front panel sports dual-range gain control and gain switch, polarity reverse switch, 48V on/off switch for phantom power, and all front-panel switches are LED illuminated. There is a ground-lift switch on the back. In the basic configuration, which does not include an output transformer, the outputs are unbalanced. When Jensen JT-11 output transformers are installed, the outputs are considered "floating" to prevent ground loops. The chassis ground isolation switch isolates the chassis ground from the signal ground. You can start with one channel and add channels as you need, and additional pre-amp cards, meter cards, and output transformers may be ordered as needed. For all the details, contact The John Hardy Company. P.O. Box AA631, Evanston, IL 60204. Tel: 708-864-8060. Circle EQ free lit. #101.



CHANNELING

The new Prisma Random Access Multi-Channel Digital Audio Production System from Spectral Synthesis is a fully professional tracking, editing, and processing product. Prisma plays, records, and mixes 12 simultaneous digital audio segments on 64 virtual tracks. Signal processing for multi-band parametric EQ on every active channel is included in the basic system. Other effects and plenty of off-line DSP are also supported within the basic hardware and software. Prisma communicates digitally in either 2, 4, or 8 channels through industry standard AES/EBU, S/PDIF, or SPECTRAL multi-I/O protocols. The software is called Prismatic, and is a work-alike interface to StudioTracks. Retail price is \$3995. For more information, contact Spectral Synthesis, Inc., 19501 144th Ave. N.E. #1000A, Woodinville, WA 98072. Tel: 206-487-2931. Circle EQ free lit. #102.

AND THEN THERE WERE THREE

Digital Audio Labs has just introduced Version 3 of their EdDitor PC-based hard-disk recording and editing package with powerful new features in a user-friendly environment. Version 3 offers Windows 3.1 multimedia compatibility. It performs hard-disk recording and playback of .WAV files with any standard sample rate, stereo or mono, 8- or 16-bit. Multiple EdDitors can be run at the same time, and a special clipboard lets you pass sounds from one EdDitor to another. It can also multitask with other Windows 3.1 software, such as a MIDI sequencer. Sounds can be triggered by MIDI or SMPTE timecode. New editing features include Sample Reversal, which reverses the order of audio samples in a selected region; Gearshift, which simulates the speeding up or slowing down of an audio tape with the sound changing both in pitch and speed; Gain Change, which makes it easy to change the audio level of a selected region; and Normalize, which will automatically adjust the gain to maximum level without clipping. Version 3



is \$250 and Version 2 DAL owners can upgrade for \$50. To get all the details, contact Digital Audio Labs, 14505 21st Ave. N., Suite 202, Plymouth, MN 55447. Tel: 612-473-7626. Circle EQ free lit. #103.



KOOL KAT

The new dk10 is a ten-pad drum kit in a compact package. It's the latest in Kat's line of MIDI controllers, and, at \$499, it's the most affordable in the line as well. Rather than creating drum tracks from a keyboard, the dk10 allows musicians to play the parts with sticks. Its compact design also makes it ideal for the project room that doesn't have enough space for acoustic drums. Simply connect the MIDI Out of the dk10 into the MIDI In of any sound source and it's ready to go. Setting up note/sound assignments is easy too — just hold down the footswitch and play the pad until you arrive at the sound you desire. The dk10 comes with 10 ergonomic pads in one box, programmable note/sound assignments, programmable MIDI channel, input for bass drum trigger, input for hi-hat and more. To feel the rhythm, contact Kat, 300 Burnett Road, Chicopee, MA 01020. Tel: 413-594-7466. Circle EQ free lit. #104.

OTTO-MATION

The new OTTO-1604 from Mackie is an automation retrofit for the CR-1604 16-channel mic/line mixer. OTTO upgrades the CR-1604 to real-time fader and muting MIDI automation, and works with any PC, Atari, Amiga, or Macintosh



sequencer that supports virtual faders. The CR-1604 was designed with the internal connections necessary for internal automation from the start, and it is the only compact 16-channel mixer with this capability. Features include unlimited subgroups; timed and pre-programmed, automated fades and crossfade; and automatic archiving. Retail price is \$849. To learn more, contact Mackie Designs Incorporated, 20205 144th N.E., Woodinville, WA 98072. Tel: 800-258-6883. Circle EQ free lit. #105.



FULL EFFECT

Backed by Electrovoice's three-year electronics warranty, the E-V Dynacord reverb is designed to provide great reverbs and room simulations with other multi-effects capabilities. Designed and built in Germany, the DRP 15 features 24-bit signal processing and 17 different effects structures of which six can be used simultaneously. Each effects structure has up to 23 editable parameters and some of the effects include pitch shift, chorus, flanger, phaser, equalizer, gates, and delays. The DRP 15 has 100 factory presets and 128 user memories. In addition to its full MIDI implementation with real-time editing, its 90 dB signal-to-noise ratio, 0.03 percent distortion, and full 20 kHz frequency response ensure quality performance. For more information, contact E-V Dynacord at 600 Cecil Street, Buchanan, MI 49107. 800-234-6831. Circle EQ free lit. #106.

HAVE YOU HEARD...

dbx recently added the Model 1024 Dual Buffer Amplifier to its product line. The 1024 is designed for properly interconnecting pieces of audio equipment that use different operating levels (-10 dBV, +4 dBU, +8 dBU, and so on). Typical applications include connecting studio level effects processors to -10 consoles and connecting consumer tape or CD players to professional consoles...**AKG Acoustics** has been shipping the Blue Line Series, a new modular line of microphones. The line is comprised of one preamplifier, eight different microphone capsules, and a full range of dedicated accessories. In addition to the flexibility provided by the choice of capsules, the system's new ModuLock positive action bayonet coupling allows system components to be assembled accurately and quickly under tough real-world conditions...The **Kurzweil Mark 150** is an electronic keyboard in a grand piano cabinet. It features a 200-watt, seven-channel, seven-speaker system, designed in cooperation with **Boston Acoustics**, for superior sound quality and dispersion and includes a 12-inch 80-watt subwoofer, two 20-watt 6.5-inch midrange speakers, two 20-watt 5-inch midrange speakers, and two 1-inch 20-watt tweeters...The WZ-DM30 digital multiprocessor is a 1-input /4-output 20-bit digital multiprocessor recently introduced by **Ramsa**. It features compressor/limiters, a graphic equalizer, 4-way crossover network, four 4-band parametric equalizers, time delay, and component alignment delays in each output. All controllable parameter settings can be stored in 16 event memories in each mode and can be retrieved instantaneously...**Creative Sound Design** has released The Synthesizer Collection Volume 1 CD-ROM for the Emulator III/EIIIx. This disc features 80 banks (500 MB) of sought after synthesizer sounds of yesterday and today in the EIII/EIIIx format. The Synthesizer Collection contains over 2000 presets and 800 samples of the individual synthesizers, custom digital stacks, and effects...The founder of **Trident Audio**, Malcolm Toft, has launched a new console manufacturing company, **Malcolm Toft Associates Ltd.** (MTA). The company has already received orders and has a full dealer network set up in North America. The first product to be unveiled is the Series 960, a split input/monitor design offering 32, 40 or 48 inputs and 24 group outputs. An unusual feature is full 4-band equalization on both inputs and monitors, providing 56, 64, and 72 equalized inputs on mixdown...**OSC** has introduced Metro, a professional level MIDI sequencer for the Macintosh which includes full synchronized integration with Deck 2.0, OSC's award-winning multitrack digital audio software package. Metro combines ease of use with such features as real-time graphic editing and full SMPTE synchronization at an affordable price...**Apogee** has addressed the concerns about long-term data retention and reliability of DAT tape with its DDS standard, jointly developed by Apogee and a leading manufacturer of premium data grade tape. The DDS symbol sets the error rate to be less than 1 in 360,000 flux transitions (five times more critical than the IEC 60A audio standard).

EQ PRODUCT VIEWS



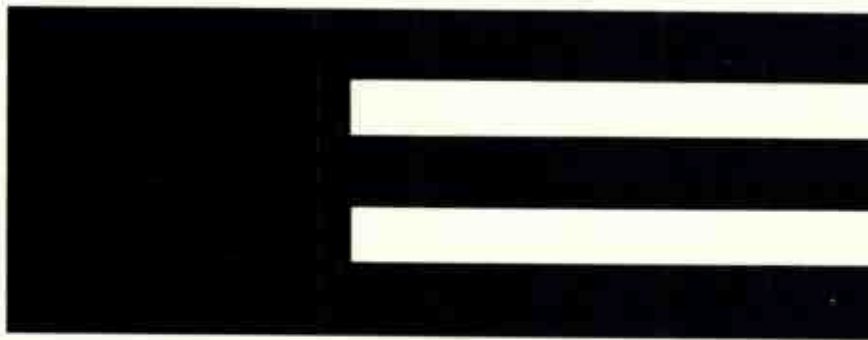
NEW NEUMANN

The new TLM 193 from Neumann is a large diaphragm, double membrane cardioid condenser mic designed for recording, broadcast and live-sound applications. With a virtually flat frequency response between 20 Hz and 20 kHz and a signal-to-noise ratio of 73 dB, the TLM 193 is an affordably priced, high-performance Neumann that physically resembles a U89. High sound-pressure capability reaches 140 dB before overload, yielding a whopping dynamic range of 130 dB. Expected retail will be under \$1300. To learn more about the TLM 193, contact Neumann USA, 6 Vista Drive, P.O. Box 987, Old Lyme, CT. 06371. Tel: 203-434-5220. Circle EQ free lit. #107.

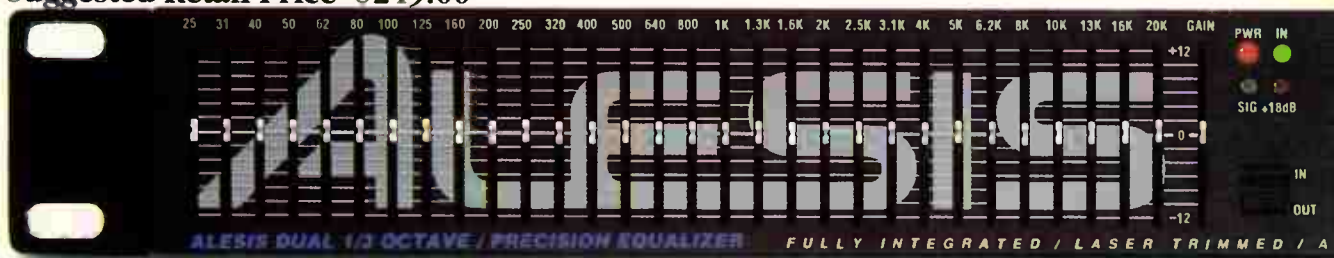
TWO CHANNELS ARE BETTER THAN ONE



The new dbx model 760X is a two-channel mic preamplifier designed to provide high performance. Typical applications include direct-to-DAT or sampler recording, field recording, and use as an upgrade for existing mic pres in a mixer. The transparent circuitry is flat +0, -15 dB from 20 Hz to 20 kHz, and has a functional bandwidth of 2 Hz to 200 kHz. Each channel of the 760X provides standard professional mic pre features including gain trim, polarity reverse, 48V phantom power, overload indication, servo-balanced XLR outputs, and 1/4-inch outputs. The one-rack high, half-rack wide unit fits easily on or alongside other equipment, and comes with the factory hardware necessary for mounting in a standard EIA 19-inch rack by itself, alongside another 760X, or alongside any other dbx half-rack standard processor. Suggested retail is \$349. For more information, contact AKG Acoustics, Inc., 1525 Alvarado Street, San Francisco, CA 94577. Tel: 510-351-3500. Circle EQ free lit. #108.



Suggested Retail Price \$249.00*



EQ. Clean and Precise. The right EQ to fix a track or shape a mix. Or to flatten the response of your studio monitors.

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1/3 octave ANSI/ISO centers, and features ± 12 dB of boost or cut so you can really dig in where you need to. Plus, to protect your speakers if power is interrupted, we've included Auto Power Muting.

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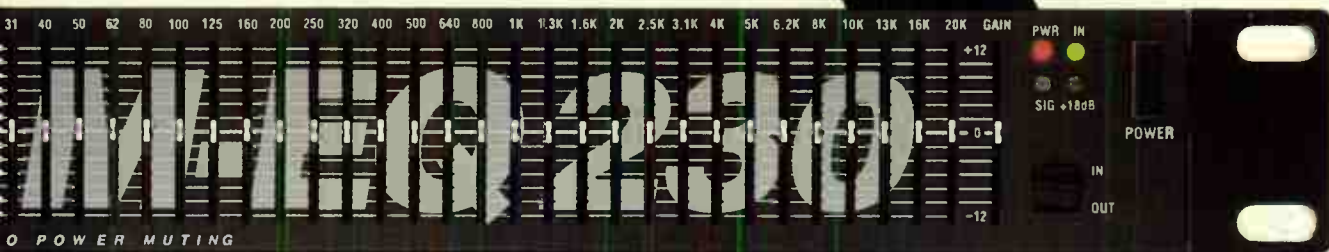
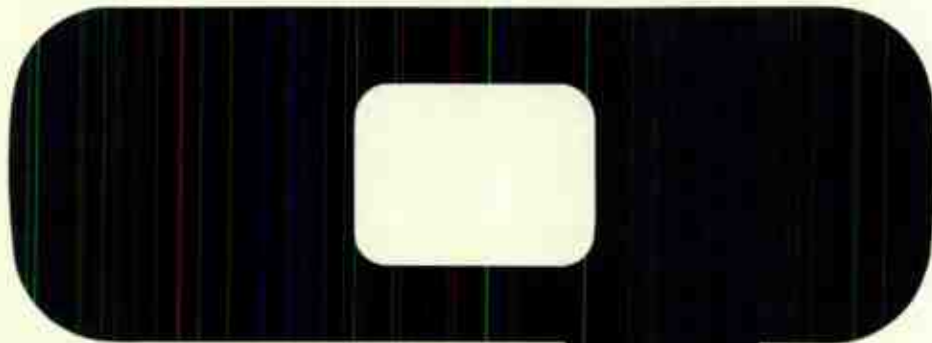
22 FOR THE ROAD (OR STUDIO)

Samson Audio, a new division of Samson Technologies, has introduced the MPL 2242 professional mixer which, the manufacturer says, offers unique features and a sonic performance never available before in this product category. The MPL 2242 — Samson Audio's flagship product — is designed for a variety of recording and live applications. The MPL 2242 is a 22-channel mixer with six stereo and 10 mono channels, complete with 10 XLR inputs for MIDI and live applications. It can function as a 19-inch rackmount device or as a tabletop mixer — the jack field in the rear of the unit can rotate up to 90 degrees. The MPL 2242 uses four dedicated sub group faders and has PFL and in-place soloing functions that can be monitored using the unit's LED meters. Additional features include a 4-band EQ on each channel; six aux sends and returns; a frequency range of 15 Hz to 30 kHz (+/- 1 dB); built-in

headphone amp; and inserts on all XLR channels. Suggested retail is \$1129. For more information, contact Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068. Tel: 516-932-3810. Circle EQ free lit. #109.

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Cost-effective and ideally suited for storing cables, microphones, tools, guitar strings, and just about anything else, the new model ED "Econo Drawers" from Middle Atlantic Products can be used in any rack or road case. Manufactured using 16-gauge steel finished with a durable black powder coating, Econo-Drawer configurations range in size from one rack size to three and are 10 inches deep. A spring-loaded latch is provided with each unit along with a fully-enclosed top to keep the contents inside. A single drawer unit retails for \$48.89, the two-drawer model lists for \$53.33, and the three-drawer version retails for \$57.78. For further details, contact Middle Atlantic Products, 8 North Corporate Drive, Riverdale, NJ. 07457. Tel: 201-839-1011. EQ free lit. #110.



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Photo by Sharon M. Beard

JON ANDERSON gets back on track with a holographic sound system from Digital Designs.

Y E S M A N

Jon Anderson

"By using a solar-paneled studio, you have the option of recording in locations that are far different from the norm."

Twenty-five years ago, Jon Anderson began a fantastic journey that would take him from the lower regions of the London art-rock scene to the top of America's *Billboard* pop charts. As frontman for the supergroup Yes, Anderson's unmistakable, high tenor voice gave life to such songs as "Roundabout," "I've Seen All Good People," and "Owner Of A Lonely

Heart" — irresistible AOR staples for an entire generation of radio listeners. Now, after collaborating with Vangelis, Kitaro, and fellow Yes-man Trevor Rabin in their personal home studios, this wizard of wily vocals is reveling in a recording paradise of his own making: Opio Productions.

Named after the small French village where he settled down to assess his future goals, Opio Productions is Anderson's personal home-studio-away-from-home, a place where he can distance himself from Bruford, Wakeman, Howe, and others who have worked with him on a variety of Yes-oriented escapades. Some of the pet projects Anderson has been nursing at Opio include a rap opera based on the Greek tragedy *Antigone*, and musicals based on the lives of author Henry Miller and activist Nelson Mandela. Video game soundtracks, adver-

tising jingles, and symphonies-in-progress round off a musical inventory that reflects the efforts of a tirelessly creative mind.

"A few years ago, I realized that I have to stop floating along with the wind and get myself together for the next decade or so," says Anderson. "I wanted to start working on the things I believed in again." After his mission was defined, Anderson set-up two Akai MG14D digital 12-track recorders, a Fostex 4030 synchronizer, and some reinvented Korg M-1's in his beautiful Los Angeles home. A holophonic sound system, consisting of 10 Digital Designs speakers positioned from high up in the ceiling to three feet off the ground, was built to create the perfect *sound around* effect.

"I'm really interested in holophonic music," he enthuses, "because then you start talking in terms of the music being a movable entity within itself. The colors and sounds it creates can really affect your emotions."

While sound quality plays an important role in Anderson's home studio, another element that is equally vital to his agenda is portability. Not too far in the future, Anderson will be able to record on mountaintops, near sparkling seas, in jungles and forests — anywhere his studio can operate off the rays of the sun. "I'm interested in getting some solar panels in there and making the studio very roadworthy. By using a solar-paneled studio, you have the option of recording in locations that are far different from the norm." For his next studio outing, Anderson plans to surround himself with the sights and sounds of the Orient. Since Opio was originally built as a blueprint for a future home studio in China, it would be the fulfillment of a lifelong dream.

In addition to his many musical projects currently underway, Anderson plans, above all else, to learn. "I'm always learning from people like Trevor [Rabin] and Vangelis," he says. "Vangelis has a profound effect on me because he's literally reinventing music. It's like reinventing the rose."

Are there any plans for the man who sang "Leave It" to come back to the band that he is most prominently identified with? "Yes," states Anderson, pun intended. "We are doing an album right now. It's funny because,

THE EQ 5-MINUTE INTERVIEW: GREG MACKIE

EQ: What is the Mackie philosophy?

MACKIE: Our philosophy is to give the end user the best possible product at a fair price. The product is the "engine" that drives everything. If a company designs a mediocre product, they have to expend a large amount of their resources advertising it, promoting it, discounting it, and so on. That doesn't provide any value to the end user. We take exactly the opposite approach: We put our resources into things that increase the value of what we make.

EQ: As a corporation, Mackie Designs is known for its being pretty laid back...

MACKIE: That may be our outward appearance, but you should visit our factory on any given workday. There's a terrific amount of energy around here — there has to be to produce the kind of quality product we do for the price. I think what people perceive as "laid back" is actually the fact that we really enjoy doing what we do.



PHOTO BY PETER D. FIGER

EQ: How did you turn your love for audio into a successful business?

MACKIE: Fright...starvation...unemployment. Seriously, though, I was in a band in high school and naturally couldn't afford good equipment — it was outrageously overpriced and appeared to be created by the people who designed radios, luggage, and sewing machines. So I started building my own.

EQ: What is it about this market that told you that "personal" pro audio would be a growing niche?

MACKIE: Five years ago, when I started this company, I noticed that synthesizers were coming down in price as quality was going up, to the point where far more people than just full-time pro musicians were going to be getting them. People were going to be buying multiple keyboards and sound modules and needing a lot of inputs. At that point there weren't many high-quality/high-value mixers out there, so it was a pretty obvious thing to me to design the CR-1604.

EQ: Is Mackie positioned for growth in the studio market?

MACKIE: Our new 8-bus consoles addresses this directly. There's no doubt that products like the Alesis and Tascam 8-track digital recorders are igniting the market. It can be argued that they do the job of far more expensive professional analog recorders. Similarly, we're providing full-feature studio consoles that replace far more expensive consoles.

EQ: Do you, yourself use Mackie products?

MACKIE: The joke around here is that the biggest reason I make these products is because I want them for myself. There's some truth to that. You've got to be a fanatical user of mixers before you can really understand what features they should have. I visualize myself in a particular situation and ask myself, "What am I trying to accomplish and what would make it easier to get the job done?" You can do research, marketing surveys, and feasibility studies (or just copy somebody else's), but the all-time best way to design a product is to use a clean slate and design for the end user. Besides, by designing what I want, I know I'll be the first in line to get one.

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in the beginning, I was just a singer in a band. Then, slowly but surely, I became a musical director. Sometimes it worked, sometimes it didn't, but it was, without a doubt, a wild period." Strange to think that this is a musician who felt as if he were "floating along with the wind" just a few years ago. Not anymore.

—Jon Varman

AIR WAVING

Max Mathews

"It seems as if the radio baton is simply comprised of two timpani mallets hovering over an extra-large pizza box."

Back in 1957, while the rest of the nation was "At The Hop," Max Mathews was at the keyboard of his Bell Labs mainframe computer creating a series

of blips and beeps that he affectionately called music. Unbeknownst to everyone but him, these aural bits of computer data would one day lay the groundwork for the modern era of music.

By adhering to the mathematical maxim that computers can create any sound audible to the human ear, Mathews asserted that the computer was a completely original musical instrument, the likes of which had never been seen (or heard) before. His first breakthrough was teaching the computer to sing musical notes, a feat that led to the creation of the computer software language, Music 1-5. This was followed by the development of

the Mathews Electronic Violin, consisting solely of a violin neck and a box of electronic filters that were modeled on the resonances of a Stradivarius violin.



MIDI MAN: Max Mathews conducts with his radio batons.

Photo by Patte Wood

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Home & Studio Recording Magazine

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"Everything works simply and easily." Marans, Keyboard

"Extremely easy to set up and use." Batzdorf, H&SR



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"This box is a godsend. Kudos to Aphex. I was delighted." Anderton, EQ

"Just the thing to add some sizzle to your signal." Marans, Keyboard

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"Absolument magique!" Alain Etchart, Home Studio Recording (supplement to Keyboards, France)

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CIRCLE 37 ON FREE INFO CARD

Now, with the introduction of his most recent invention, the "father of computer music" may have finally discovered his crowning jewel.

With the help of composer Richard Boulanger, Mathews recently produced the radio baton, a versatile free-form device that plays expressive melodies with the wave of a hand. At first glance, it seems as if the radio baton is simply comprised of two timpani mallets hovering over an extra-large pizza box. But the mallets are actually batons with built-in radio transmitters, and the pizza box is a large, flat sensor incorporating five radio antennas. The principle on which the invention works is simple: The closer a radio transmitter is to a sensor, the stronger the signal. Thus, by simply moving a baton closer or farther away from the sensor, one can shade timbre, control balance, or raise the overall volume of a performance-in-progress.

Has Mathews finally entered into what many of his contemporaries are calling the age of virtual reality? "I don't object to people calling the radio baton a tool for virtual reality," he says. "I would, however, refer to it as an 'expressive sequencer' rather than as a virtual tool. It lets you play back parts like a sequencer, but you can also modify the expressive bits during a performance." In order to fulfill his dream of eliminating the more "routine" parts of playing an instrument (note selection, pressing keys, etc.), Mathews created Conductor, a software program. "This program automatically supplies the performance part of the music, while the radio baton and its user are in charge of expressiveness," elaborates Mathews. "It's just a natural evolution of what we began in the fifties."

While some musicians are beginning to see the radio baton as further evidence of technology as competition, Mathews and Boulanger note that their invention, while custom-tailored for the one-man orchestra, is also a great ensemble device. Says Boulanger, "We can simulate massive sound movements, but we also have the ability to connect and interact with the subtleties of intimate chamber music." And as if the radio baton and Conductor software aren't enough, "We're thinking about giving the conductor something special to work with," muses Boulanger. The conductor's next tool-of-trade? A modified Nintendo power glove. —Jon Varman

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A favorite of MIDI power users, the CR-1604 is a precision instrument. The MixerMixer™ (210*) provides 12 channels of mic preamp with 120 dB of gain and 100 Hz low-cut filter. Without mixing, it can be used as a Tascam-style stereo A/D converter. For example, insert CR-1604 into a Macintosh or a 4850 or 4860, which are not available in stereo. All channels are 24 dB

FADE IT • \$75

outs and three stereo 60 dB and 12 dB/oct. All channels are 24 dB of gain, so no level or headroom is lost and no additional noise is introduced. Matching 100 mm Remote Fader™ (170*) controls master level of all mixed signals from the MixerMixer (which master faders become submasters). Comes with its own 6-ft cable and can be inserted in place of a CR-1604, removed or attached to any surface. Not shown: The CordPack (695*) 32-pin quality cables that provide all the patchwork necessary to connect 3 CR-1604s to a Macintosh

EXPAND IT • \$199



Instead of 16 cheap, off-the-shelf integrated circuits, the CR-1604 has six totally discrete preamplifiers with four conjugate pair, large-emitter transistors. The result is ultra-low noise (-129dBm E.I.N. @150 ohms), 0% distortion (0.005%), astonishing headroom and extremely wide (300kHz) bandwidth that contributes to the preamps' transparent accuracy. At any gain level, you can handle everything from a close-miked kick drum to a flute with exceptional sonic fidelity and freedom from overload. This preamp design has made the CR-1604 legendary among pros who are used to \$150,000+ mega consoles (and, in dozens of documented cases on file, have enthusiastically stated that they actually prefer our preamps!). But what if you need more than six mic inputs? Simply add ten more of the same with our XLR10 Mic Preamplifier Expander (199*). It attaches in minutes to form an integrated, mechanical/electronic whole and includes its own +48V phantom power switch. Plus you can still use the line inputs on channels 7-16!

AUTOMATE IT • \$649

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ROTATE IT • \$199



Yet another twist to the CR-1604's unique rotating pod. The RotoPod bracket set (199*) creates a 10-track-space, jacks-to-top configuration with all inputs and outputs on the same surface as the mixer's controls. Special rack rails allow recessed or flush mounting.

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In The Dog House

STUDIO NAME: Dog House Studio

LOCATION: Dry Branch, Georgia

MAIN MEN: Chuck Leavell, Owner/Artist/Engineer; Skoots Lyndon, Engineer; Karl Drehl, Technician

CREDITS: Leavell has played with the Rolling Stones (everything the Stones have done since '82 including the Steel Wheels Tour), Eric Clapton (*Unplugged*), Sea Level, Allman Brothers Band, and George Harrison (tour of Japan with Clapton), among many others. He has also produced Warren Haynes' recently released album, *Tales of Ordinary Madness* (Megaforce Records). Work is currently in progress on Leavell's new album.

CONSOLE: 40-input Conneaut Audio Devices (CAD) Maxcon II

MONITORS: KRK Model 7000 nearfields
RECORDERS: Alesis ADAT (16 tracks); Revox A700 2-track; Akai MPC 60 II; TEAC C-3RX cassette

DAT MACHINES: Panasonic SV-3700

AMPLIFIERS: TOA P30000; Crown DC 300A

OUTBOARD GEAR: UREI 1176LN tube compressor; CAD PolyFrame (Series 1000); Dynacord CLS222; Korg SDD 3000, A1, DRV, and 3000; Yamaha SPX-90

KEYBOARDS: Yamaha C6 Grand Piano with Disklavier; Korg O1W Pro workstation; Korg Wavestation; Korg M1REX; Korg EX 8000; Korg DVP 1; Yamaha TX802; Yamaha DX1; Keyboard Specialties "MIDI B" (which is a MIDI'd Hammond B-3 custom-built by Paul Homb); Korg T-1; 1973 Wurlitzer 200 electric piano; Honer D-6 Clavinette

SAMPLERS: Korg DSM-1

MICROPHONES: AKG 414 [2]; Shure SM 57, 58; Sennheiser 441; CAD Equitek II

EQUIPMENT NOTES: Leavell states: I love

the old tube stuff and I wish I had more — that's what I like so much about the CAD board. It has such a warm sound. The EQ will stand up to anything, and it's as quiet as a mouse. For the keyboards, the Korg O1W Pro is a real joy — it does all I need from a workstation and more. But I always use a real piano — I love my Yamaha Disklavier and you can't beat a real Hammond B-3.

I have an oversized Leslie case specially built to serve as an isolation booth (mics are mounted on the inside of the case, while XLR outs are mounted on the outside of the case).

My bathroom doubles as an isolation booth with all the connections built into the wall.

PRODUCTION NOTES: Leavell continues: This studio is in its infancy stage, so we're still not sure exactly where it may go. Personally, for my own use now, I foresee working with other artists here, perhaps as a preproduction or writing suite-type facility. A little bit into the future, I could see expansion for full-blown production.

I believe the music is the magic of the moment. I'll sacrifice a little quality on the technological side for a great track any day of the week. But, of course, the name of the game is to be prepared — you must be ready to capture that moment, or it is gone forever.

STUDIO NOTES: This studio really is a room with a view — it is located on his 1500-acre award-winning tree farm, which overlooks a 10-acre lake. "There's nobody around here for miles," Leavell says. "Sometimes I mic my guitar amps outside for a different sound — it's not like the neighbors are going to complain." **EQ**



Move over Rover!

Chuck Leavell takes over in his project studio.



World Radio History

Photo by Ken Krakow

Ramblin' Man

STUDIO NAME: Bismeaux Studio, Austin, TX

MAIN MEN: Ray Benson, Owner; Frank Campbell, Studio Manager; Larry Seyer, Studio Engineer; Roy Kircher, Road Manager and Road Sound Engineer.

CREDITS: Ray Benson is guitarist and vocalist, as well as a founding member of the band Asleep at the Wheel. The band's latest album is being recorded at Bismeaux. Other artists who have recorded in the studio include Garth Brooks, George Strait, Willie Nelson, Huey Lewis, Brooks & Dunn, Suzy Bogguss, Marty Stuart, Leon Rausch, Eldon Shamblin, Johnny Gimble, Herb Remington, Johnny Rodriguez, Riders in the Sky, and the Austin Lounge Lizards.

RECORDING RACK: Peavey Production Series 1600 (32x16); McIntosh power amps; Tannoy system 10 monitors; Aerco custom-built MS decoder; Trident A Range (2 channels); API 312 mic preamp (4 channels); Sontec mic preamps [2]; Summit mic preamps [4]; Jensen mic preamps [2]; Tube-Tech mic preamp and compressors; Teletronix LA-2A compressors; UREI BL-40 compressor; dbx 160 compres-

sor; Drawmer 1960 compressor; Pultec EQP1S equalizer; Neve 1066 EQ modules [2]; API 550 and 550A EQs; Sontec EQ; Pultec EQH EQs [2]; Lexicon PCM 70 reverbs; Eventide H3000; Drawmer DS 301 gate; Mackie 1202; dbx 900 rack; Dolby SR (24-channel); 3M M79 16-track, 2-inch analog [2]; Alesis ADAT [3]; Panasonic SV 3700 DAT; Technics SV DA-10 DAT; AKG C24, 414, and 451 microphones; Neumann U47 and U64 mics; Shure 57 mics; Sennheiser 421 mics; Akai S1100 sampler with 26 MB and 44 MB removable HD with CD-ROM and IB 104; Akai S950; Kurzweil K2000 with 8 MB and 44 MB removable HD; Toshiba 3200 computer running Texture version 4.5 (for sequencing), MQX-32M MIDI interface.

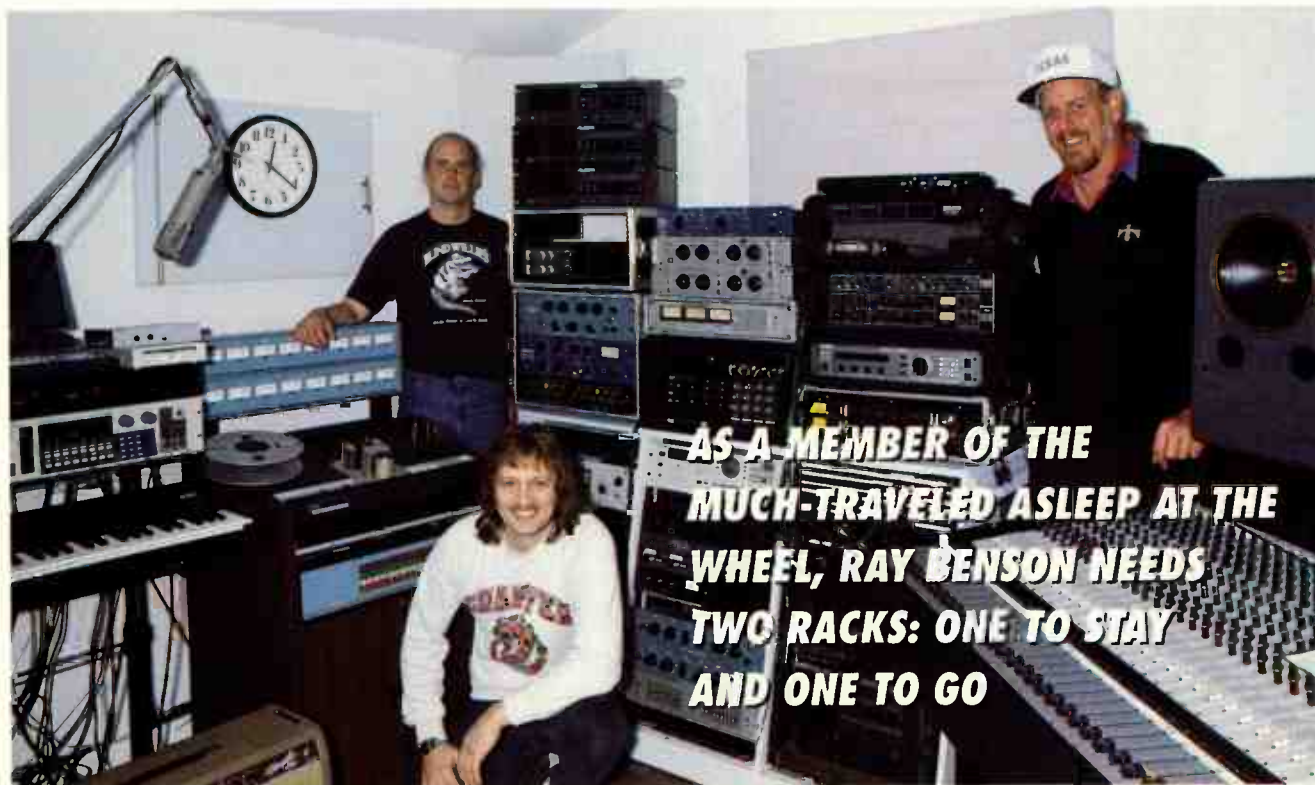
SOUND REINFORCEMENT RACK: Tube-Tech compressors [2]; Aphex Expressors [4]; Brook Siren System DPR402 compressors [2]; T.C. Electronics 2240 parametric EQ; Tube-Tech mic pre; Yamaha REV 7; Yamaha SPX-900 [2]; Eventide H-3000; Valley People Audio Max EQ [2]; Valley People Audio Kepex II noise gates [8]; Furman PL-8 [2]; Furman AR-117; JLC Cooper fader

master; Panasonic 3700 DAT; Shure SM58 (for vocals) and SM98's (for drums); Electro-Voice wireless system (for guitars and sax); Fender Twin amplifiers.

EQUIPMENT NOTES: Benson explains: I have three Alesis ADATs and I love the modular concept. I will eventually put an 8-track machine on the outboard rack. That's my next plan.

When I'm on the road, I find that the Tube-Tech compressors are very dependable and smooth sounding. I don't want to travel with old gear because it breaks, and the Tube-Techs are a great compromise because they're new, roadworthy gear that have an "old" sound. With the DAT machine, I can make 2-track recordings on the road. The Electro-Voice wireless system is wonderful. There's no compander circuit and it sounds very realistic compared with other models I've tried.

At home I use tube mics, but I wouldn't dare take them out on the road. My tubes give me my sounds. I would like to get more, but right now the ones I have serve me well. **EC**



AS A MEMBER OF THE
MUCH-TRAVELED ASLEEP AT THE
WHEEL, RAY BENSON NEEDS
TWO RACKS: ONE TO STAY
AND ONE TO GO

Photo by Jimmy Carr

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World Radio History

CIRCLE 47 ON FREE INFO CARD

Roll Your Own Digital Masters



Photo by Ed Aiona

Digital recording is here,
but how do you prepare
it for mastering?

BY CRAIG ANDERTON

Mastering has typically been the weak link in the project studio. Sure, you can mix down to DAT — but how about assembling those mixes into a smooth, well-integrated recording, adding P and Q codes, and transferring over to a format like Sony 1630? Although it's still difficult to do everything without going to a real mastering facility, you can, nonetheless, do several of the most important parts of the mastering process in today's project studio.

Once again, hard-disk and 8-track digital tape technology has come to the rescue. If you mix to DAT and have something like an Alesis ADAT or Tascam DA-88, you already have a great premastering machine and may not know it. If you also have a hard-disk recording/processing system à la Sound Tools, you're even further ahead. But first, let's talk a bit about why mastering is so important.

MASTERING BASICS

Proper mastering can make a marginal recording acceptable, or a good recording great. Often the difference between what comes out of a modest project studio and a multimillion-dollar facility is not in the recording, but in the mastering. Good mastering engineers are rare, because they need to make flawless aesthetic decisions as well as have total command over signal processing technology.

Here are some of the procedures used during the mastering process that you can do in a project studio:

- Balance levels between different cuts, or even within different sections of the same cut.
- Apply overall EQ to add "sheen," or to compensate for problems (e.g., remove bass caused by bad monitors that led to a bass-heavy mix).
- Make a tune more "radio-ready" by adding compression or limiting to allow a higher average signal level.
- Crossfade between cuts.
- Add processing, such as a hint of reverb, to tunes that seem too dry.
- Create fade-outs and fade-ins.
- Denoise noisy sections through gain-riding, software programs, or single-ended noise reduction systems.

MASTERING THE HARD (DISK) WAY

Quite a few people use hard-disk digital audio systems for mastering. The basic idea is to bounce your tracks over to the hard-disk system (digitally, if you have a DAT with digital I/O), then apply digital EQ, limiting, gain changes, and so on. You can then assemble a playlist to try out different song orders and when everything is as desired, transfer the results back to DAT for your final master tape. There are some limitations, however, involved with using only hard-disk systems:

- You sacrifice real-time control, which is very important with mastering. For example, to process a piece of music, you usually have to set up the parameters, then wait while the computer crunches its numbers to do the processing. It's cumbersome with budget hard-disk systems to do something such as increasing the treble a

few dB over several measures, then pulling it back a bit later.

- There are device-specific limitations. For example, with Sound Tools, crossfades are done in RAM — and you know how digital audio gobbles up memory.

- It ain't a totally digital world (at least not yet). I have a bunch of nifty analog processors, from the obsolete-but-fun EXR Projector to the new Aphex model 104, that are ideal for mastering and have no equivalent function in any hard-disk system I've seen.

THE TAPE TEST

Adding a digital multitrack to the equation can overcome these limitations; the only tradeoff is a theoretical loss of quality if you bounce using the analog inputs. (Of course, if you can bounce digitally, this isn't an issue.) In practice, though, the difference in quality may not be noticeable. There may even be a subjective improvement. To find out if your system is up to the task, try this experiment:

1. Mix some tracks to DAT.
2. Bounce the DAT over to two tracks of your digital deck.
3. Bounce the digital deck tracks back to DAT.
4. Compare the original DAT sound with the one that was bounced to the digital deck and back. If the bounced version sounds okay to you, you're ready to master.

SCALPEL, SUTURE, AUDIO: START OPERATING

The following summarizes how I do mastering with a Tascam DA-30 DAT, Sound Tools, and one Alesis ADAT. You shouldn't have any trouble modifying this procedure to fit your specific setup; it's the principles that are important.

1. Record mixes of all your tunes to DAT.
2. Bounce the DAT mixes digitally to Sound Tools, then use it for what it does best: normalization to make sure you're using the maximum available headroom, peak limiting to let you get a bit higher average level, and overall EQ changes. Sometimes these interact; for exam-

IMAGINE A RACKMOUNT MIXER...



ple, you might normalize the tune, limit the peaks to open up more headroom, then normalize again. Or, cutting some of the bass might lower some peaks, allowing for renormalization.

3. Bounce the processed tune digitally back to DAT, but don't go over your original mix so you have the original as backup.

4. Repeat steps 1-3 until all the tunes are done.

5. Next, figure out the optimum

order for the tunes. Do this by recording them all into Sound Tools and trying out several play lists until you get the right order.

6. Now it's time to assemble. Patch your DAT outs to ADAT tracks 1 and 2 (now's your big chance to include any analog processing, if appropriate), and record the first tune into ADAT.

7. Record the next tune on tracks 3 and 4. Notice how easy it is to do crossfades with this technique; just

start recording the second tune sometime before the first tune ends.

8. Record the third tune into tracks 1 and 2, and keep alternating tunes between tracks 1/2 and 3/4 until all the tunes are in ADAT.

9. Note that you still have four tracks left over. You can use these to insert additional effects or transitions (great for dance mixes) — or to add timecode, for reasons we'll get into next.

10. Now mix the ADAT tracks back down to DAT to end up with a final 2-track DAT master. If you need to make any volume tweaks, you can do so manually or by syncing automation to timecode recorded on an ADAT track (or generated by the JLCopper box or Alesis BRC).

11. If needed, you can now bounce the DAT back to Sound Tools to create additional masters for different purposes. For example, if the piece is going to be duplicated on cassette as well as CD, I often add just a tiny bit more compression and "exciter" treble enhancement to compensate for losses in the duplicating process.

THERE'S NO PLACE LIKE...

Three of the best reasons to master at your own studio are the same reasons for recording there: you can learn a lot without spending beaucoup bucks, you have more control over the final product, and you can do things over and over (and over) again until you get the sound just the way you want it. And with today's mastering tools, you have extra creative options that simply didn't exist a few years ago. Try using digital multitrack for mastering — you'll see what I mean. **EC**

Craig Anderton cut his first record at 18 as part of the '60s group Mandrake. After that he cut two more albums with Mandrake, produced three albums by classical guitarist Linda Cohen, did session work in New York, mixed recordings by new age stars David Arkenstone and Spencer Brewer, and released a solo CD in 1989 (Forward Motion, dist. by MCA).

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Close Range Conundrum

B-a-l-a-n-c-e. That's really the key to a killer mix. It's the consistent equilibrium between the various components of a mix with respect to frequency, intelligibility, and space in any listening environment. With only a zillion or so variables to deal with, an engineer or producer has a formidable task in front of him or her to arrive at such a complex audio compromise that hopefully accentuates all positive facets of the program material in any listening situation.

These days, the trend is definitely toward the use of close-range monitor systems for the majority of mixing. And why not? Close-range speakers,

which are typically within a three- to five-foot range of the listener, help to reduce the effect of any acoustic anomalies that inherently occur in

any mixing room — an unfortunate hindrance to the use of the “upstairs biggies” in many studios. Like any other piece of gear, different people wish to hear different things from their reference speakers. It's important to select the right close-range monitor for you, or your mixes will suffer. Some of the world's most respected engineers and producers offered us some insight about their close-range monitors, their reasons for their gear selections, and tips on how to select a system that's right for you.

BY GEORGE (& BY BRUCE)

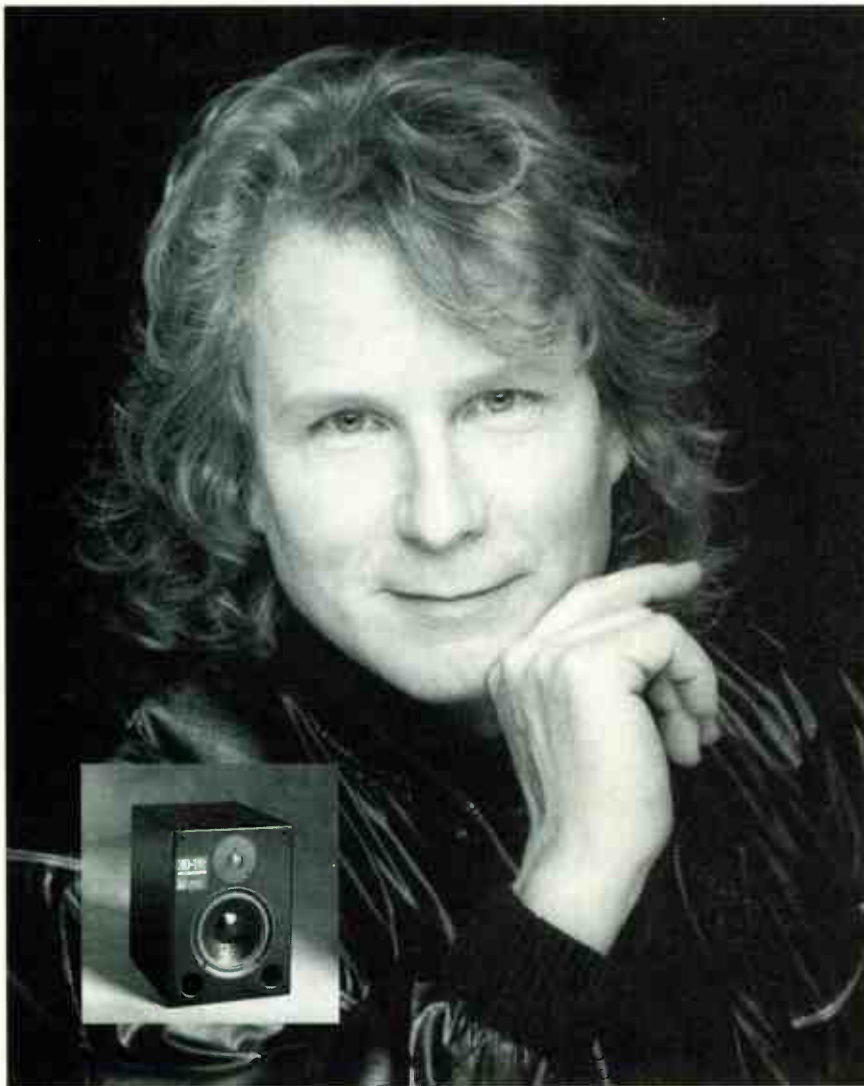
“I believe that there are no ultimate reference monitor systems, and no ‘golden ears’ to tell you that there are,” says George Massenburg, founder of George Massenburg Labs. “The standard may depend on the circumstances. For an *individual*, a monitor either works or doesn't — one should be able to tell oneself the truth about how one feels about what she or he hears. Much may be lost when one relies on an outsider's judgments and recommendations. But it's a different story when we're working on something that needs to be accessible to others.

“I've never been one to go with the herd on judgment calls like monitor selection. First, it's boring — you're not as likely to learn or discover anything new. Second, when you confine yourself to working within the constraints of someone else's taste, you're not going to advance your own art.

“But in the end I feel two things

What nearfield monitors do the pros prefer and why? Glad you asked.

BY RICHARD CHYCKI



TERRY BROWN believes in his Meyer HD-1's (inset).

strongly: Firstly, I feel that artists, producers, and engineers do better when they agree (as much as they can) on what they're hearing, and secondly, I know that I'm going to pursue as Hi-Fi a mix as is consistent with a great musical feel. Therefore, to make as few mixing errors as possible in that context, I want to hear *a lot* of detail out of monitors in pretty good balance along with just enough gratification (hype) so that you keep the artist interested."

More and more, projects are migrating from studio to studio. Massenburg's theory is to carry a speaker that sounds as consistent as possible for you across different mixing environments. Massenburg is currently using Genelec 1031A speakers for his reference monitors as he completes mixing and production tasks on the latest James Taylor live CD.

As for producer Bruce Fairbairn, his approach toward close field monitors is more of a simplistic, utilitarian view. Fairbairn's past work includes releases by Bon Jovi, Aerosmith, and Poison. He is presently at Little Mountain Sound in Vancouver, Canada working with The Scorpions.

"People expect successful producers and engineers to have the latest turbo-charged supermonitor with modified drivers and components. We simply use Yamaha NS-10's here. For me, it's the engineer's decision because he's the one that has to have a feel for the speakers. It's all a question of proportion and balance. If you have a positive comparison between other records and your mix, that is when the proper mix perspective is achieved. That can be done on any speaker really. It's just a function of what your ears are used to hearing. So pick your speakers and acclimatize yourself to them. Listen for what a good kick drum sounds like. Or a bad one. Know what airy vocals or great cymbals sound like on your speakers."

TECHNICALLY SPEAKING

For some, the componentry of a monitor is critical. Direct-field response with minimum reflection or unwanted radiations can provide a very flat, rel-



Photo by Ed Colver

BRUCE SWEDIEN is currently between nearfields, although he is leaning toward Yamaha's NS-10's.

atively distortion-free listening environment. Companies like JBL pay particular attention to direct-field response by offering some of their close-range speakers with a curvilinear front baffle that has a 7 degree cant toward the low-range driver. This apparently minimizes reflections from the console surface to the listener. Time alignment of the high/mid and low drivers increases the imaging aspects of speakers. Edges of drivers can be treated with absorbent foam to reduce spurious sound radiation from those surfaces.

Producer/engineer Terry Brown, renowned for his past work with Rush, echoes the need for ultimate technical accuracy from a monitor system: "I use Meyer HD-1's exclusively. I was looking for real precision in a monitor. These speakers have everything I've always wanted to hear in a personal monitor. I can cram loads of controlled bottom end into a mix without it sounding clumsy. When I was using unpowered speakers in the past, they all sounded remarkably different depending on the type of power amp used with the monitors. There have been occasions where I've had to ask for a different power amp to be brought in. The Meyers, being self-powered, alleviated that inconsistency completely."

At first glance, self-powered monitors seem eminently more expensive than their nonpowered counterparts. Figuring in the cost of separate speaker components, extra cabinetry,

power supplies, power amplifiers, and the additional precision involved, and the cost quickly becomes on a par with that of a quality "separates" system.

Although Terry rarely uses any other speakers for mixing, he occasionally relies on a pair of Sony Pro speakers as an alternate listening reference and a single console speaker or Auratone, citing various speaker comparisons that give the best overall compromise in a mix.

BASS-IC INSTINCT

One of the criticisms that close-field monitors have had in the past is their general lack of bass response. For those that feel that extra low end is a necessity while mixing, the use of a subwoofer offers that extra nondirectional "oomph" below 80 Hz. One advocate of a subwoofer system is Memphis-based producer/engineer Joe Hardy. Hardy's credits include ZZ Top, Tom Cochrane, and Steve Earle.

"I use NS-10's because I know what they sound like and everybody has them," Hardy commented. "I supplement the NS-10's with a subwoofer to reinforce the low end. That way, I don't ever have to use the upstairs monitors and I can still hype both the client and myself. At my home studio, I also have an NS-10 system, as well as a pair of Peavey PRM-308S's."

According to Hardy, mixing with no real, real low-end reference can be dangerous for some because there is a tendency to compensate the mix in



JOE HARDY uses NS-10's and Peavey's PM-308's (inset) to record the likes of ZZ Top.

the low end to make up for the lack of frequency response of the monitors in that frequency region. Because the low end uses up so much of a listening system's power, you can have a mix with a load of 30 Hz in it that is killing the speakers mechanically, but the mix has no overall power and punch. Hardy shies away from using the larger studio speakers as he feels they are too much a part of the studio environment to be of any mixing value.

ROCK 'N ROLL

"Translation" is the buzz word when it comes to mixes, according to Bob Rock's right hand man, Randy Staub. Staub and Rock have worked together on Metallica and Motley Crüe, and are presently working together on another Motley release. "Both Bob and I use Yamaha NS-10's plus a single mono Auratone. For the type of music that we do, which is essentially pretty hard rock, the NS-10's seem to work best, although they are not the best sounding speaker. I do have a pair of KRK 9000's that I use occasionally. They have the same reference "feel" as the NS-10's. Generally, I've found that the more deluxe a close-field speaker is, the more difficult it is to make it translate to other systems. They can sound almost *too* nice sometimes."

Michael Wagener (Skid Row, Ozzie Live) found his perfect speaker in the Infinity 2001. Wagener explained: "I listened to about 35 pairs of speakers and I settled on these \$70 speakers. They just felt best to me with the material I played through them. I don't really care that they're "cheap" speakers. They interpret my mixes very well — a little bright in the high end, but I like the additional detail that gives me in my mixes. I also use a 250-watts-per-channel power amp that I carry with me. It's an integral part of my listening system. If you

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Calum Maclean & Andy Haldane
APOLLO RECORDING, Glasgow, Scotland

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James Klotz, Owner/Engineer, SYNCHRONIZED SOUND, Atlanta, Georgia

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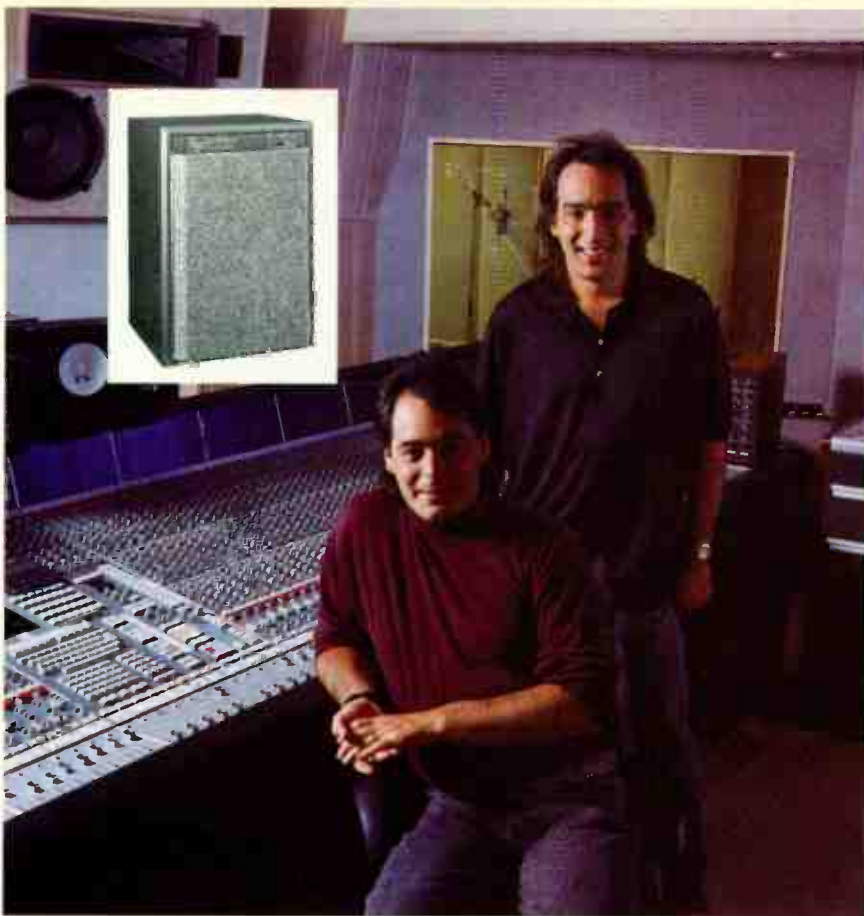
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Photo courtesy of Audio-Technica



TOM AND CHRIS LORD-ALGE have had good results with E-V's Sentry 100's (inset).

take speakers that sound good to you when you play established CDs on them, and then make your mix sound as good, the chain is complete."

A couple of other staunch NS-10 users are brothers Tom and Chris Lord-Alge. Both agree that listening on speakers that are in the range of consumers, which they feel NS-10's are, helps to develop a punchy, even mix. "Although NS-10's are a little bright," Tom adds, "they're very punchy and have a great midrange bark. If you can get a mix to sound good on NS-10's, the mix will probably sound good everywhere else. I also use an Auratone in mono as another reference. I had the opportunity of using a pair of E-V Sentry 100's on a session and had some very good results with those speakers also. They don't have quite the same midrange bark of the NS-10's, but they have a pretty cool low end. That low end is cool because I only use the large studio speakers for hype. There are only a few studios that have really great large speakers that you can actually mix with."

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Because the low end uses up so much of a listening system's power, you can have a mix with a load of 30 Hz in it that is killing the speakers mechanically, but the mix has no overall power and punch. — Joe Hardy

SOUNDS DANGEROUS

Multi-multi-million seller Michael Jackson trusted his latest release, *Dangerous*, to producer/engineer Bruce Swedien. Well known for his exotic microphone collection, meticulously designed studio, and exemplary audio work, Swedien is currently in a state of limbo with respect to close-field monitors of choice. Although he was a past Genelec user, Swedien had recently changed over to a custom pair of Yamaha NS-10's with specially designed crossovers. He drives them exclusively with a discrete Class A Electrocompaniet Norwegian power amplifier, as he feels that the power amp is vital to the overall integrity of the monitor system. As an important complement to his monitors, Swedien uses devices known as Tip Toes from San Diego. These are aluminum conical stands (he uses three for each speaker) that minimize

surface contact of the speaker with the meter-bridge support and mechanically decouple it. The sound improvement is spectacular, according to him.

Certainly the Yamaha NS-10's are a prevalent choice with many engineers and producers. But look at the range of close-field units we've seen here — all the way from Auratones to the ultra-high-end Genelec and Meyer self-powered units. Clearly, there is no one choice when it comes to the selection. But taking the time to assess each monitor system (which includes reading the great tips from the "voices of experience" in the sidebar) and finding the gear that will most cater to your requirements, will benefit your audio work with improved consistency and translation in any listening environment. But keep this in mind: Good speakers don't make good records. You do. **EQ**

SHOPPING DAY AT CLOSE-FIELD SPEAKER MART

So what is the overall recommendation for a close-field speaker by all of these audio aficionados? Sorry, they can only say what's best for them. But it's a good starting point for you to see which speakers may work best for you. In a nutshell, here is a summary of all the advice given on selecting the proper close-field monitors for you:

1. Take a bunch of CDs of program material that you know sounds good down to your local music store(s). Include some of your work, of course.
2. Have the salesman place the speakers in a proper listening position (i.e., on a console with you sitting in front of them). It makes no sense to switch between the units in the stereotypical "wall o' monitors" that most stores have because you're checking them out in a completely alien application and environment. They'll love you for this move after about the third pair of speakers, especially when you want to hear the bottom of the pile first.
3. Listen to which speakers sound best to you for as much of the material as possible. Is there enough low end for you or do you need a wider response system? How about the sweet spot? Does moving an inch throw you out of it? Try moving around a bit and see what latitude of freedom you have.
4. Try to rent, or hopefully borrow, the pair of speakers to which you are drawn and take them to your studio of choice. Use them in this environment for a few projects. When the mixes are done, take them elsewhere. How do they sound in the car? At home? In a kid's Mudtone cassette player? Is the balance between all facets of the mix maintained or does your vocal disappear on one system? How about the low end — is it blowing up less-than-optimum stereos? Listen for a consistency from test to test.
5. Forget your eyes and use your ears. The bottom line isn't that producer X uses Y speakers, so you have to use them as well. The true distinction of the correct monitor for you is that you can relate to known good mixes on a particular speaker and then develop your mixes into that genre of consistency and overall palatability.



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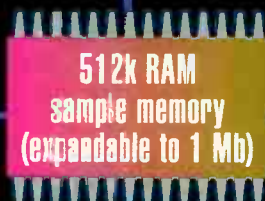
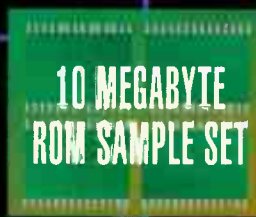
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World Radio History

DATs The Way It Is

The DAT (Digital Audio Tape recorder) has come to dominate the market for 2-channel mastering devices in just a few short years. It seems like only yesterday that engineers were hotly debating the merits of half-inch 30 ips decks versus Dolby SR on quarter-inch. Even though the half-track format persists, there are relatively few new units being sold, while sales of DAT machines continue to be brisk.

On the surface, the world of DAT machines looks simple, but if you could assemble all the available models in front of you, terror and confusion would be rife. There are timecoded DATs, portable DATs, professional

DATs, consumer DATs, DATs with SCMS and DATs without, DATs with AES I/O, and DATs with SP/DIF. This article is an attempt to hack a path through the jungle of product offerings.

There are a number of new machines arriving on the market that are advertised as 'pro' by the manufacturer (the Panasonic SV-3200 is a perfect example, with a new Sony model due shortly). But nobody has clearly defined what makes a DAT machine professional. One issue is SCMS (serial code management system). A unit with SCMS digitally stamps each tape it creates so that only that single copy of the tape can be made; further copying (i.e., copies of that copy) is inhibited (the machine locks out of record). This can have some adverse effects — see the SCMS sidebar for more details.

Another point of contention is over the type of digital input/output available on the unit. The professional standard is AES/EBU, named for the professional audio organizations that

defined it. The 'consumer' standard is SP/DIF (Sony-Philips Digital Interface), also known as IEC958 Type 2. The difference is one of connectors and levels, with the AES standard usually showing up on an XLR or optical connector, while SP/DIF normally terminates to an RCA jack. These aren't hard-and-fast rules (many small portables have an optical-format SP/DIF I/O). The most important thing to remember about these various formats is that they aren't level-compatible and you can't plug an optical and coaxial I/O together and expect them to work.

HOW DOES IT RATE?

Sampling rate deserves mention. All DATs are capable of automatically recognizing 32, 44.1, and 48 kHz formats received at their digital inputs. But machines originally designed for the consumer market are limited to 48 kHz when recording through the analog inputs. The idea, as with SCMS, was to make it hard to directly rip off a CD and digitally duplicate it. This turns out to have been an absurd waste, since no consumer market ever developed for DAT machines. The higher sampling rate yields better quality than 44.1kHz sampling, but can cause problems when attempting to master to CD.

Although programs like Pro Tools and Sound Tools (among others) can easily change sample rates, many mastering houses like to charge several hundred dollars extra for this ser-

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BY J.D. SHARP



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The important thing about these formats is that you can't plug an optical and coaxial I/O together and expect them to work.

vice. If you're stuck with a 48 kHz tape that is destined to become a CD, try and find a pal with a digital audio workstation to convert the sample rate for you.

Another feature included on several high-end machines is SMPTE timecode capability. Timecode is essential when synchronizing to video sources, as is done when laying back a music or dialog bed to a master video. Although the most advanced video postproduction houses include a DAT as part of their equipment list, the format is by no means universally accepted. The de facto standard of the industry is quarter-inch, half-track, open-reel tape with center-track timecode. Since much of the audio world has made the transition to DAT as the mastering medium of choice, we can expect video produc-

ers to follow shortly, especially since the audio component of television is gradually improving in quality and importance. Meanwhile, if you need a timecode-capable DAT today, you'll find offerings from Sony, JVC, Tascam and Fostex, all of which can be chase-locked to video editors and transports.

GOOD TIMING

DAT machines inherently offer incredible timing accuracy; a quick glance at specifications reveals that wow and flutter are virtually nonexistent. Many DATs also offer an internal timing format known as absolute time. Many applications that might seem to require timecode can in fact be accomplished with absolute time.

For instance, if you wanted to use a portable DAT to capture dialog or



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SCMS: WHY IT MATTERS

SCMS (Serial Code Management System) was devised as a compromise between the manufacturers of DAT hardware and organizations representing composers and songwriters. The idea was to inhibit unlimited copying of digital source material, making it hard to distribute perfect images of CDs. DAT machines with SCMS are capable of making a first generation copy of a CD or of a DAT tape created via the analog inputs. Any attempt to further duplicate this tape results in the record function being locked out.

What difference does it make? A typical sequence of events in the recording of a CD runs like this: A series of multitrack recordings are created. These are then mixed down to DAT. Next, individual DAT mixes are sequenced in the desired order for mastering. Finally, copies or masters are made.

When working with SCMS everything starts out smoothly. You record your original mixdown (typically) via analog input. These individual mixes can then be sequenced on another DAT machine. Now the problem begins: SCMS makes it impossible to duplicate your final, properly-sequenced mix, either for purposes of distribution or simply to back it up! If you record via the digital inputs, the entire copy-prohibit function moves up a generation, making it impossible to even sequence the cuts to a second machine. This is the reason you should strongly consider a machine without SCMS or with some means of bypassing SCMS as your primary DAT deck. Once you have SCMS dealt with, you can order a consumer-type deck as your second DAT device.

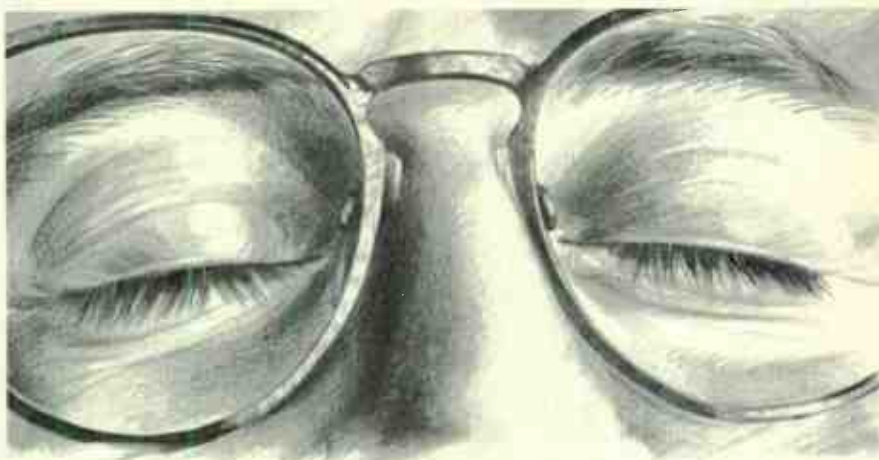
music in the field for film or video purposes, and later needed to match it up to picture, you have three choices. The obvious one is to lug a time-coded DAT into the field, but you'd be burdened by relatively large size and short battery life. A second option is to simply 'jam sync' the audio and video together; the timing accuracy is so good that if you simply start the machines together they'll remain in near-perfect relation to each other! The last option is to use the absolute time that's recorded by most DATs to generate a timecode track after the fact, a feat that most professional timecode machines are proficient at. This allows use of any portable machine at the site. Once you've created a timecode track, it's a trivial matter to dial in the correct offset on the timecode DAT. Naturally this option assumes that you're working with a video house that has a timecode DAT available for code generation and lock up to video.

Another characteristic to consider is whether a machine has two or four heads. Most DATs are two head (erase and record/play). But several four-head models are available (from Sony and Tascam). Four-head units offer the ability to monitor off the tape as it is being recorded, which comes in handy for mission-critical recording sessions and field work.

Speaking of field work, you'll have to assess whether your interests are best served by a portable or stationary device. Portables are ideal for field acquisition, and come in mighty handy. Stationary decks offer more features, dollar for dollar.

Remote controls are worth more than just a cursory glance. Most machines come with either a hard-wired or infra-red remote, which is more than

continued on page 110



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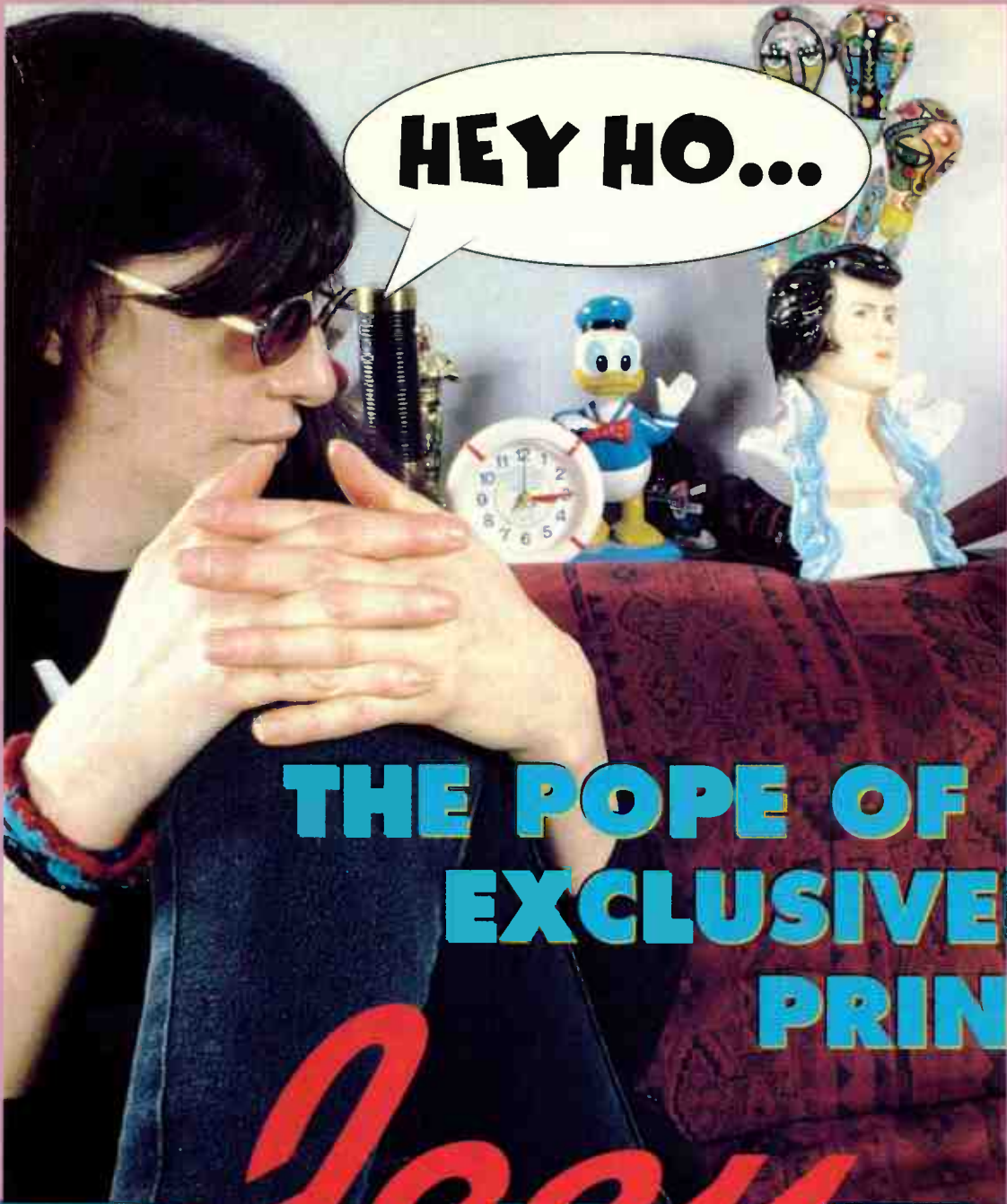
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Phil

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JOEY: I THOUGHT IT WAS COOL WHEN YOU THANKED US IN YOUR GRAMMY SPEECH

JOEY: This has been a long time coming hasn't it?

PHIL: Yeah. Everybody always asks me if we're related. Usually I tell them that our ancestors came over on the boat together and got separated at Ellis Island. That usually satisfies them. I've discovered that interviewers get ticked off when I tell them we're not related — I guess they think I'm pulling their leg.

JOEY: I thought it was cool when you thanked us in your Grammy acceptance speech.

PHIL: I remember that — I got a telegram from you the next day thanking me.

JOEY: Actually we took the name because we heard Paul McCartney used the name Paul Ramone when he traveled.

PHIL: When I worked with Paul on *Ram*, he told me a story about when he first started out he took the name Ramon, very close to our name, huh? He said he felt it was a very showbiz name, but finally decided on McCart-

ney. He did write a song called "Ram On," however, which is a little ditty that appears on the album.

JOEY: Tell me about the making of *Ram*. That's an album that I really enjoyed listening to. It was kind of experimental.

PHIL: *Ram* was an adventure. Paul got involved with a lot of American musicians, which I think is responsible for a lot of the charm of that particular album. He has a very masterful way of working with the people around him — he's very genuine about his music and tries to keep things as raw and as simple as possible. When we started working on *Ram*, Paul was definitely on his way to making a new statement.

JOEY: Recently, when we were on tour in Spain, we were watching *Wings Over America*. He performed "Uncle Albert," and I sucked it up and really enjoyed it. I like the fact that it has a lot of character, is fun, and has a real feel to it.

PHIL: That was part of his style. I think

that was where *Sgt. Pepper's* had broken the mold for record people: it had complete character from a style point of view, and there were no rules. Paul will tell you how the first album was made in a day, but as the years went by they were finally able to make music more the way they wanted to make it. So when the Beatles split up, this was a chance for him, although he was going to be compared with John no matter what he did, in terms of who was the most aggressive lyricist, and so on. People always accuse Paul of being too sweet and cutesy-pie, which is not at all the case. Those are not his roots. He just has this weird attitude that he sometimes pulls, he's like a vaudeville performer in that way. He's a throw-back to some other part of the decade or early part of this century in some cases. He's not a recent soul. In fact, I think that both he and John are from a different planet!

JOEY: There are certain people that seem a bit extraterrestrial. Take Jimi Hendrix, for example. He's most definitely not your average next door neighbor. With Hendrix, the guitar is an extension of his

PHIL: I REMEMBER THAT — I GOT A TELEGRAM FROM YOU THE NEXT DAY THANKING ME



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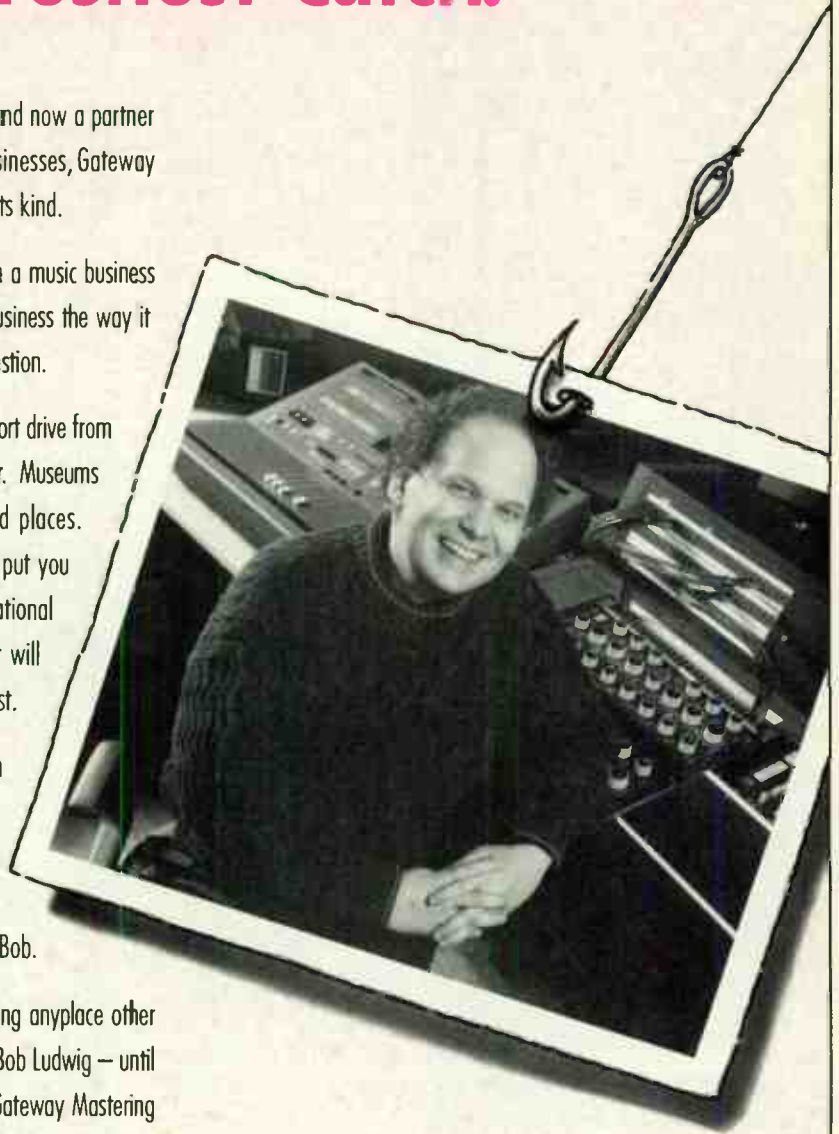
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being. It's not as though he has a guitar, it's more like an extra limb. Every time I hear a Hendrix track I'm blown away. It's all emotion and feeling and almost as though he's saying, "This is me. I am my guitar."

PHIL: You also have to realize that he was a very good showman. He could hold an audience captive for hours. The amazing thing is that when you listen to his recordings today, you still get the feeling that you are there with him, even though they're not that well recorded.

JOEY: That's another thing. I feel that to a certain degree modern-day technology has ruined — and in some cases even killed — the feeling and raw emotion in music.

PHIL: Well, it has probably forced some people to become more anal about the way they work, and from my point of view, less interesting in terms of where the drama is in the band. When it takes a whole day to reach a certain point,

themselves when they start to play, removing themselves from the atmosphere instead of playing into the character of the music. If you are going to stabilize and establish yourself as an artist, you are going to have to play with other people. In the past four or five years, bands have not been playing in isolated rooms, and that's why the Seattle scene, for example, started to happen. There's only so much time that you can remain alone — even singers and songwriters know that.

Currently, there's a major push toward capturing the feeling of the '60s and '70s. I don't like to say it's a repeat of those years, because it's always new and fresh, but it has that same approach and earthiness to it, the sound that people want to hear when they go to see a band.

Using a sequencer is great because you can get certain effects, but if it becomes part of the band, then you've



that's not playing. Playing is about what comes naturally and what you feel at a certain point in time. When you have a piece of equipment that can change the rhythm pattern simply by pressing a button, you've changed the attitude of the player. When you're young, you play with a certain aggression, and even if you only know two chords, you play them with a certain amount of feeling. That's what the basis of rock and roll bands is really about, and as you well know, it's also the biggest thrill. It would be interesting to see whether Living Colour is an extension of what Hendrix would have been today because of the style and the aggression of the guitar and the way the rhythm comes off. The Ramones certainly don't pamper the music business either, though.

JOEY: We're all rock and roll fans. The Ramones like being exciting and raw, and everybody in the band has his own distinctive style. How do you feel about the old approach to making records, in comparison with the new?

PHIL: The new approach, believe it or not, is not that far removed from the old. The only difference is that techno freaks tend to put a screen in front of

lost the essence of why people make music. But I'm not against the style, I just think it's a question of how you produce. You need to convince the people you're working with that what you're after is immediacy. They have to believe in themselves and you have to make them trust you to tell them that something is great. The key to production is to stay in the background; a good director knows when and how to get the artist to react and emote, because the chemistry of a band will only work when everybody is in the mood.

A good example is Paul Simon. Paul is a real perfectionist, but he does recognize the feeling and emotion that comes from a street musician. That passion is what recording is about. When we were in Brazil, we came across 20 or 30 drummers playing on a street corner. We pulled out the small 8-track we had with us, and the whole thing just came together emotionally. It certainly wasn't planned, and I personally think that because of what goes on in the music business, a lot of the best instinct records are missing.

I'm not blaming the engineers — I think they're very unaware of how

CIRCLE 29 ON FREE INFO CARD

important it is for the band to come into the studio and not have to wait around. If the band feels like playing in the first five minutes, there's your record. Time is wasted when the band has to wait for gates or lights to be put up. I plan my spontaneity so that no one knows that it's ready. You're not supposed to know it's ready, because you really turn on a different light.

But you can make great records today — it's just a matter of beating up the old rules. When I'm in the studio, I say to the artists, "Look, if you were going on the air in thirty minutes to do a live rock and roll broadcast, you would make it." If they don't believe that, then they won't get anywhere in the business. Today it's retarded in terms of the amount of time it takes to make a record. Dylan is a perfect example: he would make a record in one night because he had already written the tunes. Just like you, I imagine — you

PHIL: What you are referring to are the guys that used to come to recording sessions. They made the decisions and when they ran back to the office with a cassette and a dub, they'd say, "Listen to this!" I remember a time when we would have songs at all the radio stations by the next morning, if not by the end of the same night we had been at the studio. Getting this stuff on the air was the most important thing of all. That lack of immediacy is what I really miss in the business today, because I love the feeling of making a record on a Tuesday and knowing that by Thursday it'll be out. And when you have written a song, there's something about not having to wait a year for its release.

JOEY: I can't wait either. When I write a song, I'm excited about it and I want to put it down immediately. I don't want to have to wait a year or until the next album is due. I'd love to be able

tional experience, you got turned on to everything. I used to listen to the WMCA Good Guys and Murray the K and I got into the Beatles, The Stones, The Who and The Kinks. Nowadays, I can't listen to the radio. The only radio I enjoy and am truly inspired by in this day and age is Vin Scelsa's program on K-Rock (WXRK) on Sunday nights. There's no other show like his in the entire world. It's totally eclectic and a total learning experience.

PHIL: Music is educational. It's a foundation that makes you want to pick up an instrument and be creative.

JOEY: Kids today are not adventurous, at least not in America. I was amazed when I went to England for the first time in 1976. Kids there knew everything. They had all of the Gene Vincent and Little Richard singles and were totally knowledgeable about music. They literally knew everything about everything. Kids in America



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probably have the five or six tracks that you know you are going to do already prepared, and the best thing to do is not record them one at a time. What Dylan does is record them one after the other, no sequence, no rules. You put two rolls of tape in the machines and run one alternately with the other.

JOEY: We're really impatient and we just want to do it. With our last album, *Mondo Bizarro*, we got nine basic tracks down in one night. I remember how things were back in 1977. I wrote "Sheena is a Punk Rocker" and played it for Seymour [Stein, Sire Records company head] who flipped out and said, "We've got to record this song." So that same night we went to Sundragon, recorded the song overnight and put it out the very next day.

PHIL: That's what I like.

JOEY: Yeah, it's cool because there's a kind of a romance about the old days in the business and the ways things worked back then. It wasn't an industry the way it is now. You wrote your song and knocked it out immediately. It was both an exciting and emotional time. Seymour is a kid at heart and he has that real spirit a lot of record company heads don't have. A lot of them aren't even into music.

to record it while it's fresh and while I'm excited about it, because the spirit of it will come through. I was really excited when I wrote "Sedated," but then I had to wait a year before I was able to record it. By that time, I wasn't even sure if it was a good song anymore.

Today it's exciting because of all the new labels that are coming up and all the grass roots stuff that is happening, but when you're in a situation with a large record company, all the execs have to approve everything. They don't have to know what a good song is (most of them don't). To them it's all dollars and cents, so it's really frustrating.

PHIL: I totally understand that. I wish committee approval were not needed, because the audience is not that way. But I hear and understand their side of it, because their investment is so big.

JOEY: Nowadays I realize that when you are investing hundreds of thousands of dollars, it's not just a case of, "Yeah, it's a good song." It's all very political, and this Arbitron crap really undermines people. People know what they like and what they want. Listening to the radio in the '60s was a real educa-

don't know anything about anything. Everything today is visual, like MTV for example. But what we need is a really good cable show, something that uses archival footage.

PHIL: You could do that. If you're 10 or 12 years old, you're about to enter your adolescence and are about to discover music. And you'll find music about yourself, music that becomes personal to you, but I feel that you need to know where it came from. We are still watching footage from World War II and Vietnam, and people don't seem to tire of it. I think that the music world could stand to see something similar, with radio being its first sponsor, creating their own channel. Using Larry King's show as an example, you don't have to physically watch it. You can turn around or walk around the room because if the character on screen is interesting, the TV basically becomes radio with a picture. The imagination takes over, so it doesn't matter if it is blasting — "the viewer" is not glued to the screen. New York radio used to be that way. Do you remember when FM first went on the air, particularly WPLJ? We used to do a live show out of the studio I worked in.



JOEY: WABC FM?

PHIL: Yes, exactly.

JOEY: I remember Elton John in particular.

PHIL: We had Elton John, the Allman Brothers, Roberta Flack — so many people I can't remember exactly who. But it wasn't commercial. It was about playing for as long as you wanted, with

GUESS I'LL SEE YOU AT THE NEXT FAMILY REUNION

no rehearsal, while 75 to 100 people sat around listening and drinking wine.

JOEY: I think that we really should do something on the TV so that kids will watch and so we can open and expand their minds.

PHIL: It's a good idea. As a kid growing up, the radio was my salvation. I would take it to the back room to get some privacy from the family. I'd even put it under my pillow and sleep with it. But that generation has gone because people now tend to have three TV sets per household. Currently, people are talking about the pending arrival of hundreds of new cable stations as technology improves. So we should definitely give them something to go on.

I have a ten year old who flips through the radio dials as quickly as



he does the TV remote, so his music education is strictly up to him. Even though I'm the parent, I don't influence him. Sure, he hears some of the music I listen to, but I have to give him freedom of choice. I feel it's important for him to know where it all comes from.

There's definitely not a problem with crossover between the generations. For example, if you go to a Crosby, Stills & Nash or Beach Boys concert, it's frightening because the audiences are twice as young as you would expect them to be, while these old guys are up on stage doing the same act they did 20 years ago.

JOEY: We're currently in our third generation of fans and I think that with The Ramones the beauty of it is that we get fans into metal, into alternative, into rock and roll, and into punk. The whole spectrum. And the fans are from all age groups. We get mothers and fathers coming to see us with their kids. I think that that's what is so great about music today. There used to be barriers where you were either into rock or soul or jazz, but now the charts are one big mix of every music type. It's open for everyone to listen to and enjoy.

PHIL: I'm happier that there are no barriers, although I think that the music business has no choice because they tend to have to categorize you in the record store. There they say, "That's rock and roll, that's folk, and that's jazz." If they didn't, it would be totally whacked.

JOEY: Phil, it's been great meeting you, but I think we're out of time.

PHIL: Same here. Guess I'll see you at the next family reunion.

JOEY: Right.

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IS YOUR FA



BY CRAIG ANDERTON

TE



DIGIDESIGN'S SESSION 8 RAISED A LOT OF EYEBROWS AND EXPECTATIONS AT THE LAST NAMM CONVENTION. CAN IT HOLD UP TO ITS HYPE?

The Session 8 package (\$3995) contains everything needed to turn an IBM PC or compatible into an 8-track hard-disk recording studio: two plug-in PC cards, software, cables, and an audio interface box for the computer.

The system cost, including computer, compares to an 8-track digital tape/synchronizer combination — although, about the only thing the two systems have in common is the ability to record and playback 8 tracks of digital audio. Few technologies are so complementary; where one is strong, often the other is weak. So, as more people make the trek to digital-land, the question isn't whether hard disk or tape is better; it's which is more appropriate for the task at hand. Let's see how Session 8 fits into all this.



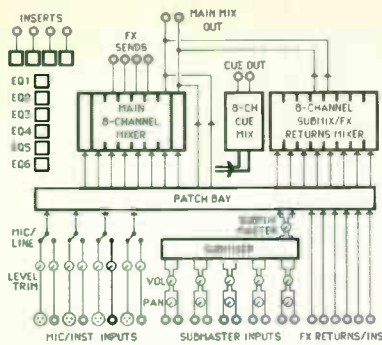


Figure 1

But first, a warning: most people expect reviews to end with a simple conclusion about whether a product is "good" or "bad," Session 8 is a different kind of product — it will hit the center of the bulls-eye for some people and miss the target completely for others. In fact, two people could look at the same feature, and one consider it an asset and the other a liability. (For example, Session 8's "closed architecture" makes for extremely smooth operation, but the tradeoff is a lack of expandability.) Therefore, we'll explain exactly what the Session 8 is, so you can decide for yourself whether or not the system is for you.

THE CONCEPT

Session 8 is the "portastudio" of hard-disk systems — compact, easy-to-use, and relatively inexpensive.

If you don't like clutter, you'll love the Session 8 since all the hardware for a decent 8-track studio is built into the studio interface. Figure 1 is a simplified diagram of what's in the box. The high points are:

- Four front panel inputs, each with two connectors (XLR and 1/4-inch phone with gain trim controls).

- Submixer. You can run Session 8 and a sequencer concurrently, so Session 8 includes a submixer that (among other things) can combine virtual MIDI tracks with the audio recorded on disk. The submixer has five pairs of rear-panel, line level, 1/4-inch phone input jacks, five panpots, five level controls, and a master level control.

- Six FX returns/inputs. These complement the four FX sends from the Session 8's "virtual mixer."

- Patchbay and Main Mixer. The Session 8 has eight A/D converters so you can record on eight tracks simultaneously. An internal patchbay, displayed as a patchbay screen can route the mic/line ins, FX returns/in, and a submix master to the desired A/D convert-

ers. These are mixed in the main mixer, whose output is the stereo master bus.

When playing back from disk, the eight tracks are controlled by the main mixer. The main mixer also has send controls for four FX sends on each channel.

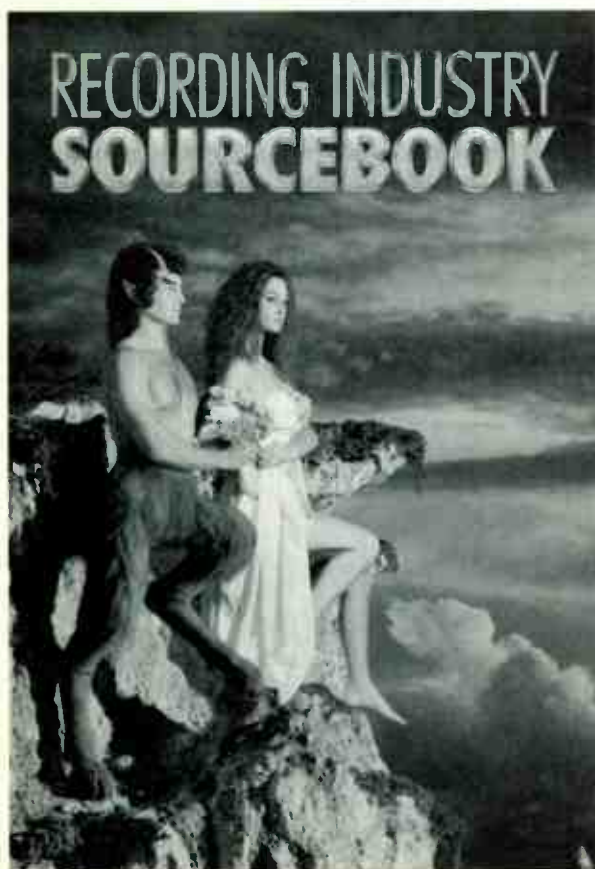
- Auxiliary 8-channel mixer. This mixes the FX returns and submixer output into the master stereo bus. As you'd expect, the FX returns can be used as extra inputs or the submixer inputs for additional FX returns. Each channel of the mixer also has four send controls that tie into the FX send bus.

- Cue mixer. Duplicates the level faders on the main mixer.

- Six bands of bypassable, quasi-parametric digital EQ with four



Session 8 Edit Window



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off to the left in the stereo mix for all of the vocal part, except for when the paperboy offered a paper to someone walking down the street. For the last vocal part of the paperboy we recorded his voice almost extreme left (about 8 o'clock on the pan pot) as if he turned his head to the right (our angle of view as straight on facing the paperboy and on the opposite side of the street). The hardest part was trying to find the proper volume for the voice. But with The EdDitor's non-destructive editing, it only took seconds to undo the last mix, and try again at a different level. Soon we found the right level, and the result was very life-like. It sounded great!"



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Session 8 Mix Window

response curves and two variables per curve: sharp bandpass, broad bandpass (both offer variable frequency from 20 Hz - 20.5 kHz and ± 12 dB boost/cut), high shelf (2.6 kHz - 20.5 kHz, +12/-30 dB), and low shelf (20 Hz - 3.2 kHz, +12/-30 dB). A level control balances the straight and bypassed levels.

These aren't shown connected to anything because each EQ stage is represented by a little rectangle on screen. Drag the rectangle into place on a fader for a stage of EQ (and a good-sounding one, at that). Drag more stages (up to four total) for multiband EQ.

- Four rear-panel, programmable 1/4-inch stereo insert jacks (carrying both send and receive signals). These are represented by rectangles and can

be dragged into the desired place on the patchbay screen.

- SPDIF digital input.

Several other ins and outs aren't shown on the diagram, such as monitor bus out with monitor level control, tape in and out (for sending to something like a DAT, then listening back to the mix), dual headphone jacks with volume controls switchable between the monitor or cue bus, and slave clock in and out.

This is a pretty respectable studio by any standards, and the fact that it's all in one box will be exactly what some people want. Those who feel limited by the closed architecture, however, will probably prefer the XL model (see later) — although this gives up some of the advantages (e.g., digital patchbay) of having everything in one box.

THE COMPUTER

Those just getting into hard-disk recording — a likely target audience for the Session 8 — will need to learn how to run a computer as well as Session 8. System requirements are a 25 MHz/386SX or better PC running windows 3.1, 4 MB RAM, VGA/Super VGA monitor, external hard drive with under 19 ms of seek time (not all hard

drives work with digital audio; check with Digidesign if you have compatibility questions), and two expansion slots (one full size).

The hard drive better be big — Session 8 chews up 40 MB per minute of 8-track recording. Fortunately, it works just like a DOS disk so you can use standard DOS and Windows commands to catalog files and run defragmentation programs. Files are stored in .WAV format for easy interfacing with multimedia programs.

MEET THE SESSION 8XL

The Session 8 variation, the Session 8XL (\$5995), uses the same cards, software (except there's no patchbay screen), and runs on a PC, but replaces the audio interface with two of the same audio interfaces used in Pro Tools. Each provides AES/EBU and SPDIF digital I/O along with four balanced, line level XLR audio ins and outs — but no FX sends and returns, headphone outs, submixer, patchbay, inserts, and so on.

Why two different models? All Session 8 needs is a power amp, computer, and mixdown deck, and you're set. It trades off less expensive A/D converters, unbalanced line operation, and lack of expandability for more features and all-in-one operation. Modest setups can have everything plugged into the Session 8, with all repatching done in software.

Session 8XL is for those who already have a high-quality mixer and patch bay setup, or those who want to replace or supplement an 8-track analog or digital recorder with a hard disk system, or need top-quality D/A converters with balanced line operation. For maximum flexibility there are two operating modes: external mix optimizes the Session 8XL as a multitrack recorder replacement, and internal mix assumes the Session 8XL is the heart of your studio — signals are input into the A/D converters, then mixed and processed digitally. This minimizes the total number of A/D conversion stages and allows for features such as automated mixing.

THE MIXER SCREEN

The mixer page has the features found on standard mixers: mutes, solos, panpots, FX send knobs, etc. You can have up to four groups by dragging a group symbol over the faders or panpots to be grouped (but this doesn't work on FX sends).

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sion 8 makes it easy. Drag the "bounce from" icon onto the tracks to be bounced, and the "bounce to" icon to the destination track. The destination channel strip turns into a VU meter for adjusting the level of the tracks being summed. To make effects and EQ settings permanent (and free up EQ stages), process a track through the effects inserts of EQ, and bounce to create a new track. Bouncing also lets you reclaim memory to some degree, as well as premix existing tracks to open up space for more tracks.

Some will welcome the extra options that bouncing offers; others will resent the extra step. Personally, considering that I was raised on 4-track tape where bouncing was a way of life, I was pleased to see a hard disk recording system that makes bouncing easy and gives new life to what can be an extremely useful technique.

EDITING TIME

If you know digital audio, Session 8 is pretty standard — you can see the waveform, zoom in or out, set up to 10 autolocation markers, etc. But if you're new to digital audio this type of editing precision is a revelation. All editing is non-destructive, so source material remains intact; you have to work to blow stuff away. However, the program does not scroll to the next screen of audio once the position cursor goes past the current screen, so you do have to zoom pretty far out if you want to see where you are in a song at all times.

Recorded data is organized on the eight tracks as "playlists," which are arrays of digital audio "regions." A track can consist of a single region, but any place within a track can be turned into a region. Regions can be selected discontinuously and offset within a track, moved to another track or layered over a track (muting the material under the new layer). This layer-based approach means you cannot select a region in a track and just delete it; you have to layer a region of silence over it. However, this has excellent applications for dance mix applications. Because the underlying material is always there, if you mute four bars and decide you'd rather mute eight, or eliminate the mute altogether, it's no problem.

One stellar feature is a list of regions. Drag the name of the region over a track to add the region to that playlist. If you want to build the perfect guitar solo, Session 8 has automated punching and a loop (cycle)

MANUFACTURER: Digidesign, 1360 Willow Road, Menlo Park, CA 94025, Tel: (415) 688-0600.

APPLICATION: PC-based "recording studio in a box".

SUMMARY: Breaks the price barrier for multitrack hard disk recording to be competitive with multitrack digital tape (\$500/channel), does so very effectively, and has an elegant user interface.

STRENGTHS: Cost-effective. Consistent, logical user interface. Easy installation. Compact. All-digital EQ and mixing. Good EQ sound.

WEAKNESSES: Requires a decent PC and backup medium for all those big digital audio files. Can't reclaim silence to save memory. No processing other than EQ.

PRICE: Session 8, \$3995, Session 8XL, \$5995. 51 remote, \$995.

recording mode that lets you record multiple takes over the same piece of music. Each take becomes a region (previous takes are muted as you play), so you can simply experiment with dragging the ones you like onto a track, muting portions of them, adding new layers, and so on until you get the solo of your dreams. (Since all these parts take up memory, it's a good practice — although a bit cumbersome — to bounce the composite track to a single track, and erase from disk the regions used to make the composite.)

Region-dragging also works well for doing drum parts — save several loops as regions, then drag them over to create a groove.

You can "snap" a region's start point, or a specific point within the region, to a bar/beat grid but unfortunately, you have to set up the grid by defining two points and specifying the number of measures between them; Session 8 interpolates the beats (this assumes no tempo changes, otherwise you'll need to take more measurements.)

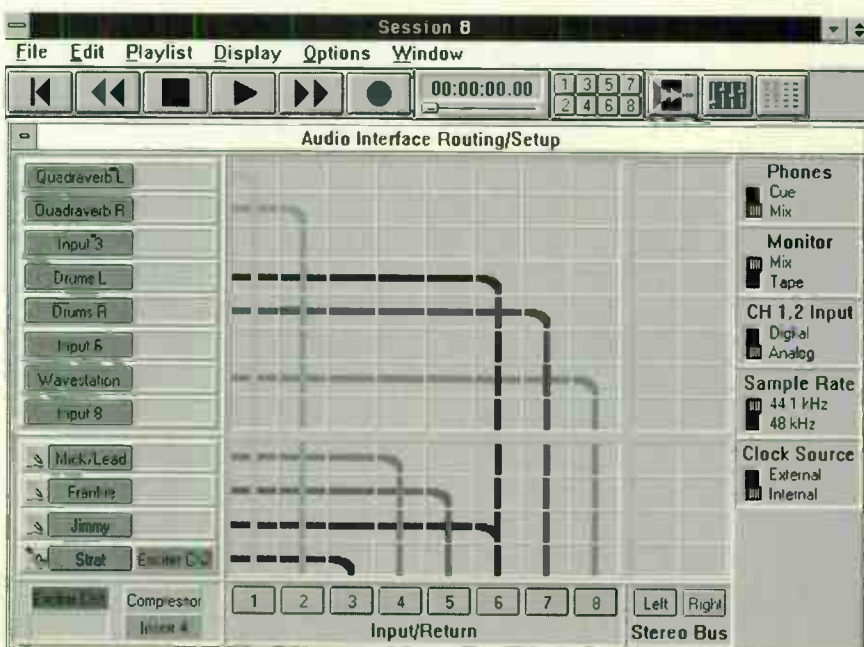
Session 8 has other useful features, like automated mixdown (you

record Session 8 data into a sequencer running under Windows, which then controls the Session 8 on playback), crossfade library for choosing different crossfade "shapes" between regions, and talkback option. There's even an optional-at-extra-cost hardware remote with eight faders, six transport control buttons, four continuous rotary encoders (great for adjusting EQ), track status LEDs, several dedicated switches for operations such as bounce, screen select, mute, solo, EQ, and six soft buttons whose functions change depending on the screen you're using.

I do have a few complaints about the interface — such as not being able to go from one transport function to another without having to hit "stop" first, the inability to clear the patch bay with a single command, and non-scrolling screens — but most are minor concerns that will probably be addressed in future software versions.

OPINION TIME

So which is a better choice, Session 8 or *continued on page 103*



Session 8 Route Window

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World Radio History

CIRCLE 24 ON FREE INFO CARD

Windows, MIDI and the MPC

From MIDI to digital video, the PC's new working environment is made for media.

By Tim Tully

Before Windows 3.1, you *could* play sound with a PC. There were, and still are, DOS-based sequencers, digital audio recorders and other equipment used by a lot of musicians, composers and producers. There was, and still is, a thriving industry that supplies sound cards for PC-based games. And of course, there was the PC speaker and its renowned beep.

When Windows 3.0 first appeared, it had no particular talents for creating or playing music, audio or moving visual images—that is, it had no particular “multimedia” abilities. But that changed radically when Microsoft released Multimedia Extensions for Windows 1.0 (MME Windows) and then, in April, 1992,

Windows 3.1—essentially Windows 3.0 with MME built in. The Multimedia Extensions not only let the PC record and play MIDI files, digital audio, sound from CD-ROM, digitized video, computer animations and multiple other media, but it did so on the system level, assuring that the various media were both compatible and expandable.

What this means to the PC user who wants to create or play music, sound or moving images on the PC, is that all these media are integrated and controlled by one set of system software. This creates an environment with possibilities that weren't previously available, and it's important to understand the overall structure of that environment. Further, as useful as Windows 3.1 is, it's far from Nirvana, so it's also important to learn a few concepts and be aware of some of the possible frustrations.

The Basics

The Multimedia Extensions in Windows 3.1 give Windows a set of “services” which it can offer to any Windows application. These multimedia services are sets of functions that an application can use (“call”) to perform specific operations such as recording and playing MIDI files or digital audio, operating CD-ROM drives or playing visual events. Windows 3.1 makes these audio and visual operations more accessible for both programmer and user, and also goes a long way towards standardizing the functions from one application to another. Specifically, it does this by the way it uses *device drivers*.

Every piece of hardware—every “device”—you'll normally use with your PC to play a sound (or animated visual event) requires a specific piece of software—a driver—to communicate with the application software controlling it. This is true whether you want to use a MIDI sequencer to play a synthesizer

WINDOWS continued on page 66-3

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Editorial



By **Tim Tully**

A lot of this issue turned out to be about standards. I know...I can hear the yawns already, but stifle for a minute and reflect on the influence standards have on our lives. In the music industry, the most prominent and well-known standard these days is probably MIDI.

MIDI achieved what it did because it came at the right time; for all its warts, it's largely responsible for creating the connectivity among computers, electronic instruments, effects, mixers, recorders and players we have today. MIDI lets us connect a dozen synths to a computer, launch a sequencer and, bingo, there's an orchestra in the room. We play the instruments, switch their sounds on a dime, fade them in and out and pump them through nine different flavors of delay, EQ and reverb faster than you could do manually with six hands. In a nutshell, there wouldn't be project studios without the MIDI standard.

When "multimedia" began its elevation to buzzword status a couple of years ago, I saw firsthand how Macintosh developers generated a lot of smoke and heat without much light on the subject, and wasn't impressed. But when Microsoft decided to issue the Multimedia Personal Computer standard (and not a very demanding standard, at that), I saw PC-oriented companies latch onto it with a passion. The inelegant, user-hostile PC rather quickly began to assume the graphic-interface, multimedia mantle the Mac had been born to wear. The contrast between the confusion on the Mac side and the focused direction in

the Windows camp was striking, all based on the simple issuance of a standard. Today, the essential, media-friendly design of the Mac and the hard work of Apple and third-party developers are beginning to alter the balance, but the jury is by no means in.

It was fascinating to watch from a music background as multimedia got its balance. Despite the broad force of the MPC spec, the foresightedness, stability and effectiveness of MIDI looked all-pro by comparison. It was painful to watch mainstream companies struggle with issues and technologies that the music world had already worked out in MIDI and digital audio. Matters like sync, event sequencing and production values that we take for granted were often not recognized or addressed, often at great cost to developer and user alike: the infamous "Not Invented Here" syndrome ran rampant. Yet, as small a niche as the MIDI industry comprises, we're now seeing a group of MIDI developers promoting standards for system-level software on the Macintosh that will probably be adopted by a much larger group of software makers and users.

Red Book audio, 16-bit resolution, SMPTE sync, and other standards—both *ad hoc* and official—have allowed musicians, composers and others in the music industry to accomplish a lot. Don't expect canonization, but don't be surprised either if in the near future, you hear a lot of suits talking about what you take for granted, as if it was just invented...by them.

But that's life. ■

EQ ■ July 1993

STUDIO SOFTWARE REPORT

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(internal or external), or an audio recording application that plays sound through a sound card, or just use a simple app that plays sounds from your CD-ROM drive. Each situation requires a particular device driver be installed in your system to translate the application's commands into a language the hardware device can understand.

Before Windows 3.1, every application had to include its own drivers—one for every device it might ever talk to. This was a burden on application programmers and users as well, creating a confusing proliferation of drivers.

Windows 3.1 is designed so the manufacturer of each device can write one driver that any application can use. This reduces the number of drivers in your system and the number of things to worry about when troubleshooting. Having Windows control your devices also enhances multitasking and the playing of multiple media on your PC.

What happens then, in very simplified terms, is this: a Windows applica-

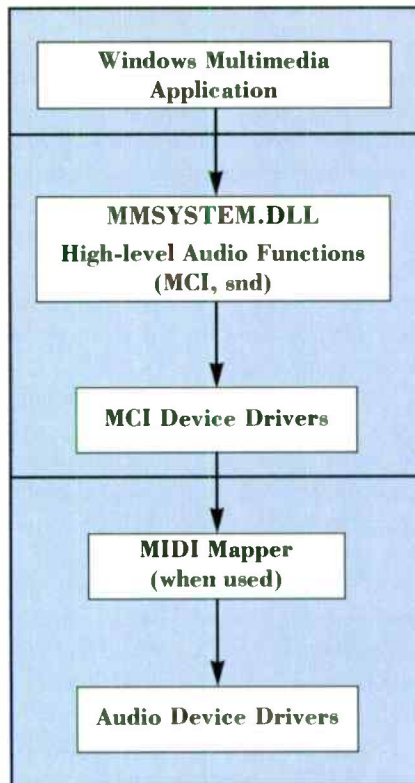


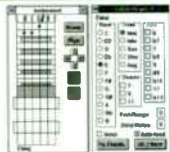
Figure 1: The flow of commands in Windows 3.1 from a multimedia application to the driver for a sound device.

tion generates data that will eventually operate a device: e.g., play a sound card. In Windows, this data first goes from the app to MMSYSTEM.DLL, a "dynamic link library" located in your \Windows\System directory. MMSYSTEM.DLL contains functions that in turn call drivers located in the Windows Media Control Interface (MCI). These MCI drivers are designed for specific media: MCIWAVE.DRV, for digital audio, MCICDA.DRV, for CD-ROMs, and MCISEQ.DRV, for MIDI sequencers. They work in the background to stream the commands they receive from your application to the specific ("low-level") audio device drivers that control the hardware devices that produce the sound (Figure 1). When it's used, the MIDI Mapper gets data right before the low level device drivers.

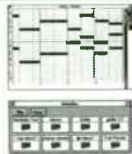
The benefits of this system may not be immediately apparent, particularly to someone who's new to creating or playing multimedia on a computer. But think of it this way: Windows' Media Control Interface relieves application programs like MIDI sequencers of the

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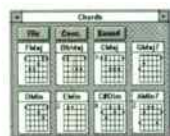
Create any chord you wish. Use chords directly while sequencing. Lots of flexibility - change instrument setup or tuning at the click of a button.



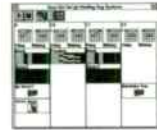
Melody and bass parts are created on-screen, imported from a MIDI file or recorded via MIDI in. No fiddling with raw MIDI data - all music elements are represented graphically.



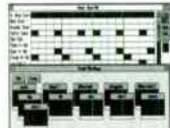
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need to contain commands for all the possible synthesizers you may have. Instead, the application can use the prewritten MCI commands to control the synth.

This system also helps integrate the functioning of separate applications. Say for example you want to use a multimedia authoring program to create a business presentation. You choose the application that's good at letting you organize and display your presentation's main points. While you might want some background music to accompany your presentation, you don't want the presentation app to be a full-fledged sequencer. The structure of Windows lets the presentation program display images while a dedicated sequencer multitasks and plays MIDI files simultaneously. Without Windows' system-level coordination, such integration is difficult or impossible.

This overview by no means covers all of Windows 3.1's multimedia functions, but it provides a general idea of how your applications, Windows and your hardware communicate.

Windows, General MIDI and the MIDI Mapper

When Windows was first developed, there already existed an enormous installed base of AdLib and Sound Blaster sound cards. These cards had primitive sound and rudimentary MIDI capabilities: they had only six-note polyphony, and one channel of percussion with five voices. While Windows had to support people who already owned these cards, two things were making this difficult. For one, the developers who had pioneered the AdLib and Sound Blaster, as well as a growing community of competitors, had already begun releasing much more capable hardware. For another, MIDI synthesizer makers were becoming aware of multimedia, and were working to bring high-quality synthesizer sound to PC sound cards, and embracing General MIDI (GM).

General MIDI allows a composer to write music that will play back correctly on any General MIDI synth, and puts MIDI music in the hands of anyone with a computer and a GM sound card. General MIDI became a catalyst for bringing higher-quality synthesized

sound and a wide selection of professionally-produced music to the PC. Because synthesizer manufacturers felt GM compatibility would provide them with a broad customer base, they began competing to produce better GM instruments.

Windows was in the position of having to support both its past and its future; and while it managed to balance these poles to a degree, there were some mixed results.

To accommodate the earlier sound cards, Microsoft invented the "base-level synthesizer" and "extended-level synthesizer." Base-level synths were the old AdLib/Sound Blaster cards: four channels, six voices, five drums, using MIDI channels 13-16. The extended-level synth was the Roland LAPC-1, which could play on channels 1-9, and had 16-note polyphony for melodic and percussive instruments.

The Windows spec took no notice of General MIDI, which specifies, among other things, instruments and music (MIDI files) that employ all 16 MIDI channels, and at least 24 voices.

MIDI Mapper

Windows' answer to this proliferation of formats was the MIDI Mapper, software that sits between applications that play MIDI files and the synthesizer that plays them. The MIDI Mapper can direct the output of a MIDI application to any of the ports going to your sound card—usually an on-board synthesizer and a MIDI out port—and can also re-route MIDI channel, patch and pitch data.

So if you play a MIDI file composed for a General MIDI synth, and your sound card or external synthesizer has a different patch, pitch or channel scheme, you can re-route the MIDI data to make the music play right on your synth.

The unfortunate part of this is that many people's first experience with MIDI comes through Windows, and the Windows user guides tend to give much more importance to MIDI Mapper than it deserves. In practice, the real-world use for the MIDI Mapper is limited, at best. If you want to play a General MIDI (GM) file on a non-GM synth, you can reroute patch and pitch data and hope for the best. Of course, no amount of mapping can make a synth with eight channels and 16 voices accommodate a

MIDI file arranged for a 16-channel, 24-voice instrument. If you happen to have a non-GM synth with different but equivalent functionality (the E-mu Proteus, for example) MIDI Mapping a score can be useful, if tedious.

Indeed, the low-priced, high-quality General MIDI instruments that have emerged, and the convenience of the GM patch map and song specs have made acceptance of GM a done deal. The only applications that cater to the old configurations are games (as they should, given the number of game players who own the old-style cards). But game companies write their own music and drivers for various sound cards, and neither are used anywhere else.

Applications designed for presentations, development, composition, education and basically everything else, use GM. Not the least reason for this is the huge library of pre-recorded GM songs.

GM files are popular because the specification was designed by musicians who understand what's required to compose an interesting, musical score, and the further difficulties of composing and producing one that will be played by a variety of MIDI instruments. They will continue their popularity because they bring high-quality music to the desktop at increasingly affordable prices.

Using It

If you *do* want to re-map a MIDI file, MIDI Mapper gives you three kinds of programmable maps that let you change outgoing MIDI data: Setup, Patch and Key (pitch). Setup Maps let you remap up to 16 MIDI channels and ports and select any patch map in your system. Patch Maps let you change the values of

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Developers!

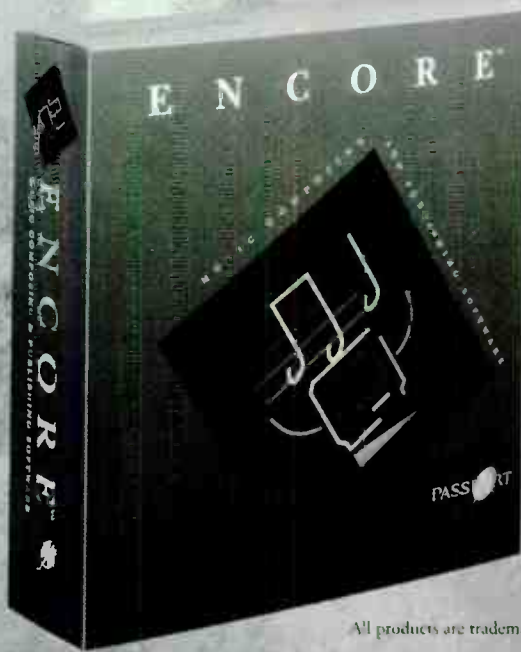
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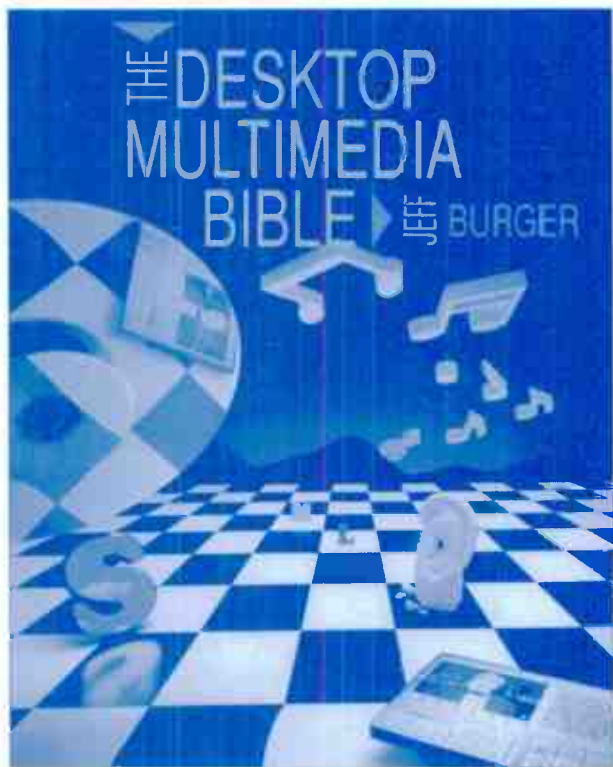
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The electronic music world is becoming ever more integrated—sequencers, tape decks and consoles are all learning the same language.

Deck 2.0 (\$299)

OSC has announced it will distribute version 2.0 of Deck, their multitrack digital audio workstation application for the Mac II/Quadra. The program offers 16-bit, 4-track, non-destructive hard disk editing using Digidesign's Audio-media or Sound Tools cards; real time moving fader automation with 24-bit resolution;

sound track for the movie using Desk's digital audio capabilities and/or a sequence played by Metro (see below).

OSC
415.252.0460

Metro (\$225)

OSC's Metro is a professional MIDI sequencer for the Mac designed specifically to synchronize with Deck 2.0 and

ACI ADAT Computer Interface (\$399)

Steinberg's ACI is a synchronizing and MIDI Machine Control device designed as an interface between the Alesis ADAT and Steinberg's Cubase or any MIDI sequencer application. The ACI allows a sequencer that supports MIDI Machine Control to control the ADAT's tape transport functions. The ACI uses the proprietary timing information from the ADAT recorder to time-lock with the sequencer, and let the user link all the sequencer's MIDI tracks with the ADAT's 128 digital audio tracks.

The system lets the sequencer act as the master controller to automate the recording process completely. The control screens in Steinberg's Cubase Audio, for example, give the user control over both the MIDI and audio processes. The ACI connects via two 9-pin sync in/out connectors along with MIDI connections.

Steinberg/Jones
818.993.4091

StudioPal (\$69.95)

Harmonic Systems, Inc. has announced the StudioPal, a conversion calculator program for the Macintosh. StudioPal handles a wide variety of conversion and computational functions useful to people who are working with audio and video recording systems. The program converts between all SMPTE Time Code formats, sequencer timing (beats/bars/ticks), feet and frames (film

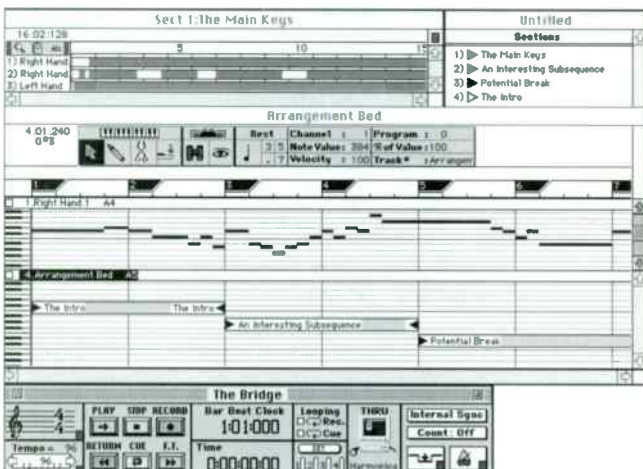
and animation), delay settings, note frequencies, chord intervals, rhythmic note values, sample rates, sample storage size, tape speed, and general units of time and distance (English and metric). The interface allows digits and their units to be displayed and manipulated easily, and allows mixed unit computations to result in the appropriate units. StudioPal is a stand-alone program (150K) which requires a Mac SE or better, running System 6.0.x or newer.

Harmonic Systems, Inc.
415.485.5242

Music Training Software

Three music training programs are available from chroMAGIC. Guitaristics 1.92 (\$69), which runs under the Atari ST's GEM operating system, is a guitar instruction program for all levels of students, including professionals. It is designed to help guitarists learn chords and scales in all keys and positions, and learn concepts of scale improvisation and chord substitution. It plays its practice scales and arpeggios over MIDI and to the computer's sound chip.

The main screen displays fretboard diagrams of chords and scales, the selected chord and scale in standard notation and an analysis of how chord and scale interact. It can display patterns for 68 chord qualities and eight different fingerings for each chord in each transposition. The user can print chord voicings for further study. The practice feature can be customized to



Metro 2.4 General Windows

an unlimited number of virtual tracks, among which sounds can be swapped instantaneously; visual editing of digital audio and automation data; timeline-style waveform editing with track-slip; and much more. The program has continuous sync to all SMPTE formats, will play back in sync with OSC's MIDI sequencer, Metro, or any supported MIDI sequencers running on the same Mac. Deck also functions as a QuickTime post-production program: it plays QuickTime movies, simultaneously allowing the user to create and edit a

Deck's QuickTime player, allowing the user to edit the soundtracks of a QuickTime movie. The program has real time graphic editing; SMPTE synchronization; use of 256 MIDI channels; 32 instruments; and moving, automated sliders, assignable to any controller. Transpose, reverse, and harmonize functions work in scales or chromatically; there are step record, human feel and quantize commands, and Metro supports OMS, MIDI Manager and the MIDI Time Piece.

OSC
415.252.0460

match any level of skill, including scale direction (ascending or descending), tempo, beat subdivision and accelerando.

Pianistics 1.10 (\$79) is a keyboard instruction program offering content similar to Guitaristics', but displays information on keyboard grids. Pianistics offers 48 scale types and eight voices each of 68 chord qualities which it can transpose to any key. Instant analysis of the selected chord/scale is available. Practice options include range, tempo, meter, and subdivision, and a metronome is available.

The Pianistics Encyclopedia (\$99) includes all of the features of Pianistics 1.10 as well as such options as the "Pattern Practice" feature, that uses a MIDI sequencer designed for music education and a number of professional song arrangements. Pianistics Encyclopedia allows practice of any section of a piece at any tempo, in any key.

**chroMAGIC Software
Innovations**
417.623.7393

Multitude

Oktal, a developer from Quebec, has announced three versions of its MIDI sequencer on three platforms. Multitude Intro (List: \$149.95; Intro Price: \$119.95), Multitude Pro (List: \$395; Intro Price: \$295) and Multitude Pro/Score (List: \$595; Intro Price: \$495) are all available for the Mac, Atari and Windows PC. All three come in English, French and Spanish versions and are currently being offered at discounted introductory prices. Oktal claims to have built its sequencers "on the assets of other sequencers" and to have improved on them. Multitude Pro has 99 levels of Undo commands; up to 256 tracks, each of which supports volume, mute, SysEx and cycling; up to 16 ghost tracks per track; 80 MIDI channels; multichannel recording; punch in and out; real time controller re-

mapping and other features. Its Song editor displays standard notation which can be edited by moving, copying, duplicating or deleting. A piano-roll Grid editor displays notes, velocity, controllers and Program Changes, allows editing of single notes or groups of notes, splitting a sequence into right and left hands by drawing a line and other features. The Drum editor holds up to 256 drum setups, with 128 instruments per setup, and can mute and remap individual instruments. A 16-track mixer records fader movement assignable to any channel and any controller. Multitude also has a Tempo editor, an Event editor, a Tape Manager (that supports MIDI Machine Control and the Fostex 8330/MTC1 Protocol interface) and a large sequence library.

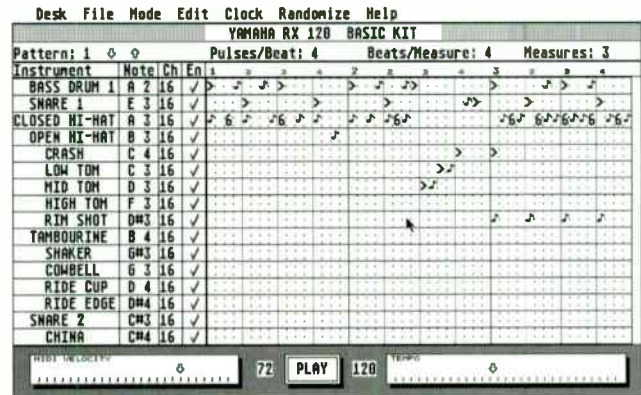
Multitude Pro/Notation is designed for professionals and education and can record a piece as a MIDI performance, then display it as a musical score. The software accommodates rewriting in styles from jazz to classical, supports lyrics, automatic recognition of chords and triplets, and displays guitar symbols, chords and fingering. It can display a lead sheet or score, position staves anywhere, have a different layout on each page, has customizable clefs, any angle of beam, supports all time signatures, both drum and guitar track displays, recognizes and displays program changes and much more.

Oktal
514.844.3428

Spirit Auto (\$449)

Steinberg has released the Spirit Auto program for the Atari. It provides fader control and information storage for automated mixing on both 16- and 24-channel Soundcraft Spirit consoles. The Atari version is currently shipping, and a Macintosh version is in development.

Steinberg/Jones
818.993.4091



MIDI Master Drummer 2.1

MIDI Master Drummer 2.1 (\$39.95)

The new version of David Snow's Master Drummer for the Atari ST has new features, an improved interface and is compatible with all Atari ST/TT TOS versions. The program lets users create rhythm tracks using a grid that divides music into patterns, phrases and songs that can be chained together. The results can be saved as a MIDI file, including tempo and velocity data, and imported into a sequencer. Master Drummer tracks can automatically con-

vert a piece to work with the different track, channel and instrument configurations of various drum machines. The program supports external MIDI start, stop and sync commands, has a full set of hot keys and on-line help.

Zobozian Software
301.963.3742

MIDI Wind Controller Synth Patches (\$39.95)

Matt Traum of Patchman Music is offering sets of MIDI instrument patches that he has programmed specifically

continued on page 66-13

WINDOWS

continued from page 66-4

MIDI Program Change messages, attenuate the volume of a patch, and use any key map you have in your system.

The Key Map lets you remap the pitch range at which a patch plays or change percussion instruments.

You can either edit the maps you find in your system or create new ones, then edit and save them for future use.

Wrap

While setup, installations and configuration can be slow going, Windows 3.1 is a remarkable new environment for the PC. It represents several giant steps towards a new role for the computer and is quickly changing the ways and means which we use it. The MPC specification has proven to be fertile ground for several new technologies that are rapidly evolving in quality and affordability. All things considered, the face of the personal computer has just taken a turn for the brighter, more musical and more articulate. ■

Sections of the above have been excerpted from The Audible PC, by Tim Tully and David M. Rubin. Scheduled for release by Sybex this July, The Audible PC will be a comprehensive coverage of the hardware, software, techniques and technology of creating music and sound in Windows.

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Manufacturers can have their products listed in the Version

Update List by sending information to: Studio Software Report, PO Box 8607, Emeryville, CA 94662-8607. Preferred media (in descending order) for submissions to the list are: 1. Text files on Macintosh or PC 3.5" floppies, 2. Fax (510.450.0301), 3. Print on paper. You can also send E-mail on PAN to SSR. Include the name of the product, whether the software is a computer application or internal to a piece of hardware, the latest version, release date of that version, cost to owners of the previous version, system requirements, the new version's important fixes and features and the name and issue of any recent magazine reviews you want people to read.

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CADENZA FOR DOS Big Noise Software 904.730.0754	2.51	5/93	\$10 or n/c <60 days from purchase		Small fixes	EM 5/90
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CLICKTRACKS Scores Unlimited 212.242.1275	2.6	1/93	\$99<v 2.x no manual <v 1.x \$69 new manl	Mac Plus	29.97 non-drop, 32-bit clean, core Apple Events, check marks next to "made" hits	HSR 7/92
CUBASE ST Steinberg-Jones 818.993.4091	3.01 Falcon: 3.02	5/93	\$10	Atari TT & ST/ Mega (1 Mbyte/ Monochrome only)	64 track sequence	KYBD 10/89
CUBASE AUDIO/MAC Steinberg-Jones 818.993.4091	1.1	5/93	\$200 new	Mac II SE30, 2M RAM Large Hard Disk	Score Printing bug fixes	
CUBASE MACINTOSH Steinberg-Jones	2.5	5/93	\$60	Mac Plus, 2M RAM	384 ppqn; 8 mixer maps; MIDI mixer; 29.97 SMPTE sync	
CUBASE WINDOWS Steinberg-Jones	1.02gs	5/93	\$60	PC/Clone; Windows 3.1	GS mapping	
CUBEAT Steinberg-Jones	2.0	4/92	\$27.50	Atari ST/Mega	Scaled down Cubase sequencer	

V. = Version #. A version number preceded by a "<" indicates the cost to owners of that version or earlier; version numbers preceded by a ">" indicates the cost to owners of that version or later. >prev means "from the previous version." Upgrades from earlier versions may cost more. R.D. = Release date. \$ = Cost of update to registered owners. REQ. = Min. hardware and software required. FIXES/FEATURES = What's cool about this version. REVIEWS = Recent magazine reviews. Abbreviations: n/c= no charge; Kybd= Keyboard; EM= Electronic Musician; CMJ= Computer Music Journal; HSR=Home & Studio Recording.

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DIGISYSTEM INIT Digidesign	2.4	5/93	n/c	Mac IIs and Quadras*		
DIGITAL PERFORMER Mark of the Unicorn 617.576.2760	1.3	5/93	n/c	Mac II, 5M RAM Digital Waveboard or Digidesign card	Complete new Manual; all performer 4.02 features; Humanize, Scale tempo; custom consoles; 4chnls on Digital Waveboard; 2 chnls of Audiomedii II	
DIGITAL WAVEBOARD Mark of the Unicorn 617.576.2760	1.0	4/92	\$1495 new	Mac II, 5M RAM, hard disk, A/D D/A converter	Hard Disk recording	
DM-80 (ROM) RolandCorpUS 213.685.5141	1.10	4/92		DM-80 8- and 4-track hard disk recorder	DM-80 operating system firmware	
ENCORE/MAC/WINDOWS Passport Designs 415.726.0280	2.6	5/93	\$99 >prev	Mac Plus/PC Windows 3.1	Proprietary True Type Font, "Anastasia"	KYBD 6/90
EPS 16+ (ROM) Ensonic 215.647.3930	1.3	7/92		EPS 16+	Intelligent backup & restore, SCSI improvements	
EZ VISION Opcode Systems 415.369.8131	1.01			OMS	Entry-level MIDI sequencer	
GALAXY Opcode Systems 415.369.8131	1.2.2	1/93	\$15 or n/c	Mac Plus; OMS		
GALAXY PLUS EDITORS Opcode Systems	1.2.2	1/93	\$99	Mac Plus; OMS	Set#2 Editors: K2000, E-mu Procuision, Alesis D4, Roland U-220	KYBD 4/92
JAZZ IMPROVISATION SOFTWARE MiBAC Music Software 507.645.5851	1.5.8	5/92		Mac, multitimbral MIDI Synth	Improved transmit routines, drum note sustain, improved printing, 12 styles, tempo and countoff control, humanize rhythm	MacWorld, 11/90, EM, 9/90, KYBD 10/90, Downbeat, 10/90
K2000 iROM Kurzweil 310.925.3200	2.0	7/92	\$150	K2000	Editing features, MIDI	KYBD 3/92
KCS Dr. T's Music Software 617.453.1454	3.5	10/91		Amiga		KYBD 10/86, 2/87
KCS LEVEL II Dr. T's Music Software		3/89		Mac		
KCS OMEGA Dr. T's Music Software	4.0			Atari		
MACPROTEUS FRONT PANEL Digidesign	1.0f2	12/92		Mac II, IIx, IIcx, IIci, IIsi or IIfx		
MASTER TRACKS PRO 5 Passport Designs 415.726.0280	5.2	5/93	>prev: \$99	Mac Plus	Auto mixer, SMPTE insert, enhanced Step Editor, transpose map, velocity editor	
MASTER TRACKS PRO FOR WINDOWS Passport Designs	4.6	1/92	>prev: \$99	IBM AT, PS2/clone, MPC, Windows 3.0, DOS 3.1Microsoft	Issues commands to Start, Stop MCIplayer to play WAV. Audio in Windows	
MASTERLIST Digidesign	2.3	12/92				
MASTERSCORE II Steinberg-Jones 818.993.4091	2.0	1/93	\$89	Atari ST/Mega	Score Printing, bugs	

VERSIONS continued on page 66-10

PRODUCT	V.	R.D.	\$	REQ.	FIXES/FEATURES	REVIEWS
MAX Opcode Systems 415.369.8131	2.5	1/93		Mac II	Flexible MIDI Programming	KYBD, 4/91
MIDISCOPE Kurzweil Music Systems 213.926.3200	1.5		n/c	Mac	MIDI data analysis	
MIDIMIXR 7s CNSLE MAC/PC Mark of the Unicorn 617.576.2760	1.1.1/ 1.02	1/93 1/93	n/c n/c	Mac PC/clone	Control MIDI Mixer 7s ditto	
MIDI TIME PIECE DA Mark of the Unicorn 617.576.2760	1.2	1/93	n/c	Mac	Set up MIDI Time Piece	
MIDI TIME PIECE ROM Mark of the Unicorn 617.576.2760	1.0d	1/93	n/c	Mac		
MIMIX Steinberg-Jones	1.06	4/92	\$5,995 new	Atari ST/Mega	Mixing automation	
MOD FACTORY Creacent Engineering 201.746.9417	1.0	3/92	\$250 new	Eventide H3000 Ultra-harmonizer	New H3000 functions: gain-ducked delay and reverb, envelope-controlled filter, audio-rate LFOs	
MOSAIC Mark of the Unicorn 617.576.2760 Fax: 617.576.3609	1.1	1/93	\$195 for Composer owners	Mac II 2.5M RAM (Sys 6) or 3M RAM (Sys 7) hard drive, ATM	Prints notation on ImageWriter, PostScript or QuickDraw printers	KYBD 2/93
MUSIC TIME MAC/PC Passport Designs 415.726.0280	1.2	5/93		IBM AT, PS2/clone, MPC, Windows 3.0, DOS 3.1Mcrsft mouse	Auto mixer, SMPTE insert, enhanced Step Editor, transpose map, velocity editor	
MUSICATOR GS/ WINDOWS THINKWARE 415.255.2091	1.0	12/92	n/c	Mac II	various feature enhancements	
OFFICE MANAGER White Crow Inc. 800.424.0310	2.5	12/92	n/c	Mac II	various feature enhancements	
OBJECT MOVER Kurzweil Music Systems 213.926.3200	2.0			Mac	K1000/1200 series librarian	
OMS Opcode Systems	1.2	1/93	n/c	Mac IIs, Quadras	Fixes problems with PowerBook modem port	EM 3/92
PERFORMER Mark of the Unicorn 617.576.2760 Fax: 617.576.3609	4.1	2/93	n/c	Mac Plus 4M RAM hard drive	partial solo; solo button in all edit wdws popup menus for track switching	KYBD 8/90
POWER CORDS Howling Dog Systems 613.599.7927	1.1	5/93	\$15, free if after 4/15/93	PC/clone, Windows 3.1, mouse, snd card or MIDI interface	Copy/move/delete groups of bars, smart MIDI thru, key transpose	
PRO TOOLS Digidesign 415.688.0600	2.0	5/93		Mac IIs, Quadra	Single application, better EQs, stabler operation, much more	
PRODUCER Passport	1.1	5/93		Mac IIs, Quadra		
Q-SHEET A/V Digidesign	2.01			Mac Plus, SE1, SE/30, IIs		
QUICKTOPIX Optical Media International 408.376.3511	1.0	3/92	\$8,500 (w/ hardware) new	Philips CDD-521 CD Recorder, Mac, PC or UNIX	CD mastering software produces CD of any format on desktop: Red Book, CD-ROM, CD-ROM XA, CD-I. Photo CD and CD-Write Once.	
S-770, S750 (ROM) RolandCorpUS 213.685.5141	2.13	2/92		Roland S-770 and S-750 samplers		KYBD 10.90

V. = Version #. A version number preceded by a "<" indicates the cost to owners of that version or earlier; version numbers preceded by a ">" indicates the cost to owners of that version or later. >prev means "from the previous version." Upgrades from earlier versions may cost more. R.D. = Release date. \$ = Cost of update to registered owners. REQ. = Min. hardware and software required. FIXES/FEATURES = What's cool about this version. REVIEWS = Recent magazine reviews. Abbreviations: n/c= no charge; Kybd= Keyboard; EM= Electronic Musician; CMJ= Computer Music Journal; HSR=Home & Studio Recording.

PRODUCT	V.	R.	D.	S	REQ.	FIXES/FEATURES	REVIEWS
S1100 (ROM) Akai 817.336.5114	2.0	5/92	\$650		S1100 sampler	Combines RAM & hard disk (incl magneto-optical) sampling, varispeed play, pan, fade, more.	
SAMPLECELL EDITOR Digidesign 415.688.0600	1.30	1/92	n/c		Mac IIs, Quadra, SampleCell Nubus Card	Direct drivers for Studio Vision, Digital Performer	
SCORE Steinberg/Jones	1.0	5/93					
SOUND ACCESS Digidesign 415.688.0600	1.10		n/c				
SOUND DESIGNER II Digidesign	2.5	12/92	>2.xx: n/c <1.xx: \$195		Mac IIs, Quadra	New time compression/expansion, pitch shifting	
SOUND DESIGNER IIPT Digidesign	2.5	12/92	\$995 for Pro Tools		Mac IIs, Quadra	New time compression/expansion, pitch shifting	
SOUND DESIGNER IISC Digidesign	2.10	1/92	n/c		Mac IIs, Quadra	Stereo sample editing software for SampleCell	
SOUND EDIT PRO MacroMedia 415.442.0200	1.0	1/92	\$349 new		Mac Plus, Sys. 6.0.7	Edit 16-bit audio, non-destructive editing, DSP effects	
SOUND STAGE Turtle Beach Systems 717.843.6916	2.0	1/93	n/c		PC w/ Windows 3.1	feature fixes, larger buffers	
STUDIO 3 DA Opcode Systems 415.369.8131	1.01	9/89	n/c		Studio 3 Interface		
STUDIO 5/OMS SETUP Opcode Systems	1.1.3	1/92	n/c		Studio 5 Interface	More OMS device names	
STUDIO VISION Opcode Systems 415.369.8131	1.44	5/93	>1.3 n/c <1.3 \$29		Mac SE or II with Digidesign card; OMS	New Control Bar with new control buttons, new manual, lock markers to bar, beat or SMPTE, editing during playback, relock free-time sequences.	KYBD 1/91; EM 2/91
TIGER CUB Dr. T's Music Software 617.455.1454	1.1	10/91			Amiga		
TIGER Dr. T's Music Software	1.21	2/91			Atari		KYBD 2/90
TIMEBANDIT Steinberg-Jones 818.993.4091	1.0	5/93	\$495. new		Mac II, LC, SE/30 and Classic I	Time Correction, Compression, Expansion, Pitch Shift and Harmonisation effects for Sound Designer II files	
TIMECODE READER (ROM) EnterTee Inc. 804.353.7133	1.1		\$179		PC/Clone DOS, Windows 3.x	Captures SMPTE to Clipboard	
TRACKCHART Opcode Systems	1.03	4/92	n/c		Mac Plus	Sys 7 compat., 32-bit clean	
TURBOSYNTH Digidesign 415.688.0600	2.00				Mac Plus, SE, SE/30, II, IIX, IICX or IICI	Sound creation and editing system for samplers	KYBD 10/88
VISION Opcode Systems 415.369.8131	1.43	5/93	>1.3 n/c <1.3 \$29		Mac Plus		KYBD 7/89
WAVE FOR WINDOWS Turtle Beach Systems	1/93	2.0	\$39		PC/clone Windows 3.1	DSP reverb, delay, pitch shift	
X-OR Dr. T's Music Software	2.1A				Mac, PC/clone		KYBD 1/91

Tips and Techniques

The 10-Step Guide to Chip Replacement

By Craig Anderton

A chip update is an easy way to gain new features—but if you don't do it right, you could end up with anything from frustration to a massive repair bill.

Updating a chip, or set of chips, is hopelessly intimidating to some people and trivial to others. The truth lies somewhere in between: there's no need to be intimidated, but you can't exactly be casual about the process either. If you want a successful chip transplant, it's good practice to follow these ten steps.

1 Be prepared. Save everything in the memory of the unit being updated, since you may have to re-initialize it. Then unplug the unit, find a well-lit work space, and gather your tools:

- Screwdrivers (for disassembling the case to get to the chip)
- IC inserter/extractor (Radio Shack #276-1581, \$6.95)
- Needlenose pliers or IC pin aligner (Radio Shack #276-1594, \$3.50)
- Small piece of aluminum foil
- Paper and pencil

2 Locate the chip to be replaced. This may or may not be easy. Some units have a "trap door" that escorts you right to the machine's innards, where you can easily replace the chip. With other devices, you may have to disassemble the case, remove circuit boards, and unbundle cables to get at the chip.

Remember that you're dealing with a fragile piece of gear where one mistake can cause serious problems. If the chip's location is not obvious, you're probably better off having an authorized service center do the update for you.

3 Write down the chip orientation. A chip will have a notch or dot at one end (Fig. 1), and it is vital that the replacement chip be oriented in the same way.

Failure to do this will probably fry the chip, and may damage the power supply too. If two or more chips need to be replaced, write down their locations and any distinctive markings or part numbers. Do not trust your memory! If the phone rings in the middle of a chip change and you have to run off to a session, you may not remember which chip went where when you return.

4 Discharge yourself. Calm down, we're talking static electricity here.

Touching circuitry after you've accumulated a static charge (e.g., from walking across a rug on a day with low humidity) could destroy sensitive silicon parts. Worse yet, sometimes static damage weakens the chip instead of outright killing it, causing intermittent problems (a repair person's nightmare) or a complete failure when you least expect it.

The best approach is to wear a conductive ground strap (e.g., Radio Shack #276-2397, \$3.29); one end goes around your wrist, and the other end clips to the device's chassis ground through a resistor. If you don't use a ground strap, at least touch a metal ground to discharge any static electricity from yourself before handling any chips, and don't do anything that could accumulate a charge while you're replacing the chip.

Having said all that, modern chips are remarkably resistant to static damage—but there's no need to tempt fate.

5 Remove the old chip(s). If the chip is soldered in, forget it. Close the unit back up and go to a service center. Otherwise, use the IC puller to remove the chip. Pull straight up and out of the

socket; you may need to rock back and forth very slightly to loosen the grip of the socket on the chip, but avoid bending the chip's pins as you pull the chip out. Place the chip on the piece of aluminum foil so that the pins are contacting metal.

Since you're replacing the old chip(s), why worry about treating them with care? Simple: the new chips may be defective, or there may be bugs in the new software that make you want to go back to the original chips. Don't burn your bridges.

6 Insert the new chip(s). De-static yourself and remove the new chips from their protective foam, foil, or plastic IC carrier. If the IC pins aren't straight, use an IC pin aligner or needlenose pliers; unstraightened pins can bend under the chip when inserted, or worse, break off. Insert the chip in the IC insertion tool, and plug the chip into its accompanying socket. Remember to double-check the orientation of the notch or dot!

Incidentally, you don't absolutely need an IC insertion tool; you can always line up one row of pins in the socket, then push gently against the opposite side of the chip until the other row of pins lines up with the other side of the socket. But the proper tool costs a lot less than a botched IC insertion, and besides, it's always a good idea to use the right tool for the right job.

7 Push down gently on the chip. Apply even pressure at both ends to make sure the chip is well seated in the



Figure 1

socket. Usually there will be a little resistance as the chip seats firmly in the socket, but be careful not to push too hard if the motherboard isn't well supported under the chip—bending the board could break a trace or solder connection, leading to a big-time repair bill.

8 Double-check the chip orientation against your original drawing. Once you're sure it's okay, close up the unit.

9 Re-initialize the device. This may not be required, but it's good practice anyway. If you do re-initialize, then you'll probably want to reload the memory contents you saved back in step 1.

Congratulations! You're updated.

10 Return the old chip. This is the coup de grâce: after you're sure that everything checks out okay and you're satisfied with the new software, return the old chips to the manufacturer so that they can be reused. Who knows, the service people may be so impressed by your level of consideration that they'll give you special treatment next time you need a quick repair job.

The eleventh step, of course, is to make some fabulous sounds with your updated unit. Good luck! ■

Got any tips for using your studio software? Let us know. We'll print the best ones and send you \$5.00 for the favor. Send tips to the editorial address on the masthead.

NEXT GENERATION

continued from page 66-7

for wind controllers. Traum personally uses and vouches for the usability of each patch, and has specifically chosen instruments that respond well to the needs of MIDI wind controllers. Patches are available for the Akai EW1, Kurzweil K2000/K2000r, Yamaha SY99, SY/TG77, TX802, TX81Z, Oberheim Matrix 1000 and Ensoniq ESQ -1, ESQ-m and SQ-80. Each patch is designed to respond to MIDI controller #2 (Breath) to achieve expressivity through the player's breath. Mono mode is used when appropriate.

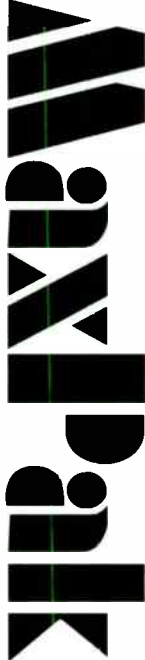
The banks of sounds are available on data cassette, floppies formatted for individual instruments, Opcode Ed/Lib or Galaxy and Macintosh MIDI files (SysEx).

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Software Directions

STUDIO SOFTWARE NEWS AND UPDATES

Is a CD-ROM the storage medium of the future for project studios? And is the world ready for a single-standard MIDI Mac?

The do-it-yourself CD/CD-ROM scene is heating up. Prices on the machines that write CDs/CD-ROMs are getting low enough so even a small project studio can at least think about investing in one. The benefits: you can permanently store any standard form of computer data on a CD-ROM: it acts like a hard disk that you can't erase. A major difference is that CDs and CD-ROMs are magneto-optical (MO) media, a seriously more stable medium than magnetic media like floppies or hard disks. To alter the data on an MO disc, you need a particular configuration of lasers, heads and other esoterica, and *not* just a mild blow, or a magnetic field like the ones at airport security checks, near loudspeakers, and in other common locations. For those increasingly large libraries of samples, digital audio tracks or visuals—like a scanned photo, or the computer animation you scored—a stable, \$125, 650 MB MO disc beats a moody, \$70, 44MB SyQuest any day.

All the new ROM writers can write Red Book audio—the same kind of data used to store sound on an ordinary audio CD. So having a machine that will write anything from a work session to a final master to a CD saves you both hard disk space and backup worries, especially considering MO media cost: about thirty cents per MB. The machines also create standard CD-ROM format files (ISO 9660) and will be able to write in the not-yet-approved Orange Book Multisession mode. This will let you write a few files, stop the process, then write more at a later date. Under current standards, you can only

write once to a CD-ROM.

Other than the speed edge the Kodak disc has, no manufacturer could give me clear hardware differentiations among the various units, and all agreed that cross-platform support, upgrade path, customer support and the quality of the bundled software would be the true way to separate the men from the boys here.

The **Kodak PCD Writer 200** (\$5995) is an outgrowth of the company's Photo CD system. It writes to and reads discs at twice the speed of other drives. It operates as a standalone unit and connects to any personal computer that supports SCSI. **Kodak:** 800.242.2424 ext. 52.

JVC is offering the **Personal Archiver**. In addition to a half-height Personal Archiver for the Macintosh (\$3995), JVC is also offering a more costly external drive and a tower system that also includes a hard disk. **JVC:** 714.965.2610.

Pinnacle Micro has released the **RCD-202** CD-ROM mastering drive. One model is designed for installation in a half-height Mac or PC drive bay, another as a standalone external drive. Bundled with easy-to-use software, it has a list price of \$3995. **Pinnacle Micro:** 800.553.7070.

■ Composer **Bruce Coughlin**, who created the original **Clicktracks**, reports that **Scores Unlimited** now distributes his intuitive and useful film-scoring program, previously distributed by **Passport**. Clicktracks began in 1986 as a shareware program on the PAN electronic bulletin board. After growing with the help of user feedback, the program was picked up by Passport in 1987.

Clicktracks automates the most

tedious chores in scoring a film or video: creating a clickbook and locating hit points. The program's clickbook looks at a MIDI sequence and calculates the time—in beats per minute or frames per beat—of the sequence's first 600 beats. It can also create a "hitlist" in which the composer sets a tempo, then enters the points within a video that need musical accenting. From this list of SMPTE times, Clicktracks tells you on which beat the hits fall, or how far off the beat they are. The composer can then change tempos and meter to make things fit as well as possible, then export the hitlist as a MIDI file that contains all the timing changes.

The new version (2.6) supports core Apple Events, the 29.97 non-drop frame rate, and color on color QD machines. New features include improved functioning on large monitors, check marks next to "made" hits, and control over the MIDI Time Piece's SMPTE Time Code generation. **Scores Unlimited:** 212.242.1275.

■ Often overlooked in the furious competition between the Mac and the PC is the **Commodore Amiga** and its many adherents. One company that has been bringing useful and appealing music software to the platform for years is **Todor Fay** and **Melissa Grey's Blue Ribbon Soundworks**. Grey and Fay were two of the pioneers who struggled early on with the Amiga's quirky approach to timing, eventually taming it in programs such as the sequencer, **Bars&Pipes**. Blue Ribbon Soundworks today makes programs for all sorts of musical needs from the amateur to the professional.

Bars&Pipes Professional is a MIDI sequencer whose basic interface eschews the more common piano roll



metaphor in favor of pipes and plumbing icons. The user sees a series of pipes, joints and faucets on the screen that route, loop and otherwise offer very clever control over various aspects of the music to allow non-destructive, real time editing. Bars&Pipes is also one of the few applications that's been successful using the add-on module approach to development. Users can now add over forty different modules that offer functions from an accent randomizer to a multimedia synchronizer.

Super Jam 1.1 is billed as a program that lets anyone, from amateur to professional, write music. Such features as one-touch chords, ready-made, customizable chord changes and styles, graphic song construction and editing, use of both MIDI and digital audio and sync to multimedia applications combine algorithmic composition with more traditional approaches to make for a truly intriguing piece of software.

PatchMeister is Blue Ribbon's universal patch librarian. It features 75-character patch names, a clock gadget, a sort bank option and many other features. It can send a note off command to all 128 MIDI notes on each of sixteen channels and has new drivers for Yamaha, Ensoniq, ART, Tascam and E-mu devices. Blue Ribbon also makes both digitized sounds, MIDI sequences and extra Super Jam style templates. Bars&Pipes Professional and Super Jam are also available for the **Iris Indigo Workstation**.

The company has also stepped into the hardware arena, and now sells **Triple Play Plus** and the **One-stop Music Shop**. Triple Play is an Amiga MIDI interface that works with Bars&Pipes Pro, Super Jam and any other sequencer to provide 48 discrete MIDI outs. The One-stop is an Amiga expansion card that complies to the MPC spec and includes a General MIDI E-mu Proteus chip. It also contains over 210 samples in 4MB of ROM and its own MIDI interface to communicate with the rest of the world. **Blue Ribbon Soundworks Ltd.:** 404.377.1514.

■ **Opcode** has announced version 2.0 of **OMS**, its widely-used Macintosh system software. The company has

renamed OMS the "Open Music System" and discontinued licensing fees as of the January NAMM show. Opcode has asserted that it wants development of the software to be open to all Mac/MIDI developers and that it will incorporate source code from any developer who wants to contribute. The new OMS, a Macintosh system extension, is designed to act as a central MIDI driver allowing communication among any brand of compatible MIDI software and hardware. It will also allow inter-application communication, so the user can send MIDI data from one application to another. Other goals include simpler management of a user's MIDI hardware, real time multitasking and more.

More than 25 new developers have already signed on, including **Passport, Steinberg, Digidesign, Mackie Designs, Lone Wolf, Roland, Lexicon** and **Emagic**. These companies are expecting Opcode to give them access to its source code, in order for them to develop the "hooks" needed to make their applications compatible with OMS.

Mark of the Unicorn has proposed a similar system-integration solution. **Free MIDI** would also be a Mac system extension, initially permitting communication of system setups, patch names and other data among MOTU sequencers, **Performer**, and **Digital Performer**; its editor/librarian, **UniSyn** and its scoring program, **Mosaic**. The company plans to give Free MIDI source code to any developer, so other companies' programs can share MIDI data, system timing services, sound management support and more.

While the specter of conflicting system standards is bound to loom in such situations, MOTU claims that OMS and Free MIDI will not be conflicting standards and that MOTU will support OMS and hopes Opcode reciprocates. In fact, timing may provide a default solution: as more than one developer pointed out, OMS is here, and Free MIDI is still just a proposal. **Opcode Systems:** 415.856.3333; **Mark of the Unicorn:** 617.576.2760.

■ **Steinberg/Jones** is developing

Cubase Score for the **PC Windows** environment. The program is intended to integrate the MIDI sequencer Cubase with a professional-quality music publishing application. Steinberg maintains the program will have an intuitive working environment that simplifies score processing, multiple staves that include polyphonic voicing, display quantize and transpose, free-floating text and lyric input and drum notation. Score will use a symbols palette to provide the essential marks and articulations, and the program will "guess" the chord symbols from your music and place them above the staff. The user will be able to work with either of two windows: Edit and Page, for a choice of working on recording MIDI or on the score, with neither necessarily affecting the other. **Steinberg/Jones:** 818.993.4091.

■ **Compuserve**, the giant electronic bulletin board system that's been a staple in the mainstream business/computer industry for years, now has no fewer than four different forums devoted to MIDI. The **MIDI/Music Forum** features excerpts from interviews and columns; synthesizer patches; online manufacturer support; and "many helpful 'expert' members." You can send messages to other members, access libraries, and read conferences with music industry professionals. It offers such goodies as Windows .WAV and Mac .snd files of music from various artists, classified ads, and a Tape Artists Public Exchange. It has recently added two new libraries: "Basics & Products" and a "General MIDI Songs" library.

There are also three **MIDI Vendor Forums** where members telecommunicate directly with such MIDI developers as Howling Dog, Steinberg/Jones, Dr. T's, Turtle Beach, Twelve Tone, E-mu, JLCoooper, Kurzweil, Big Noise, Barefoot, Cool Shoes, Mackie, Coda, Sweetwater, Passport, Soundcraft and PC sound card maker, Media Vision. Look for a Studio Software Report forum soon. Compuserve members find MIDI forums by typing GO MIDI; non-members can join by calling **Compuserve:** 800.524.3388 Representative 232. Outside the US and Canada: 614.457.0802. ■

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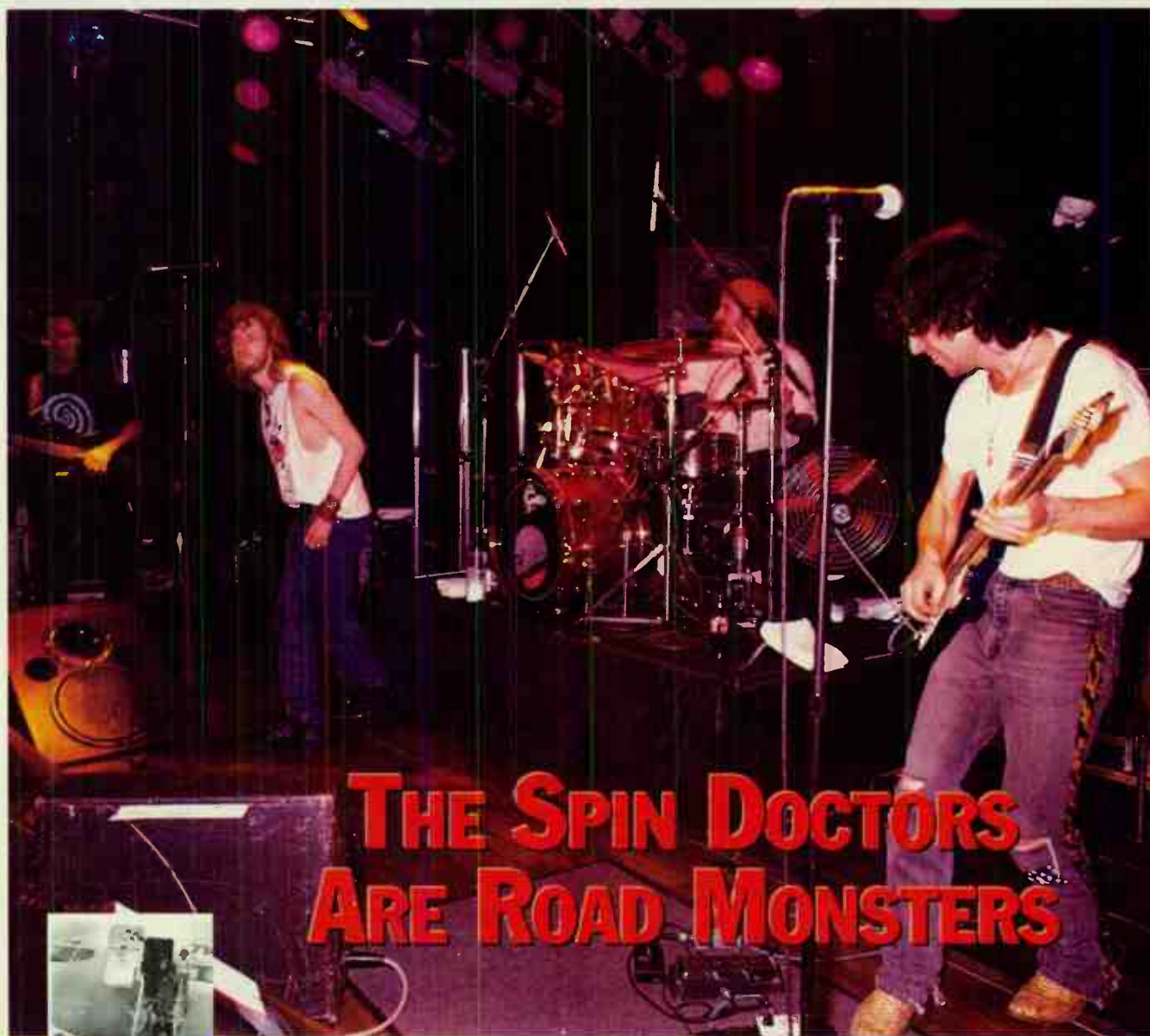
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BAND IN A VAN

EAR PLUGS FOR THE DEAD
PAGE 74



LIVE SOUND FOR THE GIGGING MUSICIAN



THE SPIN DOCTORS ARE ROAD MONSTERS



INSIDE: BAND IN A PLANE
GETTING THE MOST OUT OF YOUR RACK



Anyone can spin records. Why not spin some heads?

You've got to admit, we do have a point here. And one that's easily addressed by the extraordinary new DJ-70 Sampling Workstation from Roland. As the first instrument designed specifically for deejays, the DJ-70 makes sampling so easy, you don't have to be a master mixer to figure it out. It features 16-bit, CD-quality stereo sampling and two megabytes of memory (which can be easily expanded to four). You can sample beats which can be auto-looped in tempo and even perform turntable-like scratching of CD samples—forward or backward, with or without pitch change—courtesy of a "Scratch Dial". Add a 37-note keyboard and eight assignable pads and it's almost like having 47 turntables at your disposal. And as if that weren't enough, the DJ-70 includes an eight track sequencer for live sequencing and a built-in 3.5" floppy disc drive for saving samples and songs. Heck, there's even time stretching and compression, a cue feature, and a "transforming" capability.

The new DJ-70 Sampling Workstation from Roland. See your dealer today for a test spin. **Roland®**

PUTTING A NEW SPIN ON THINGS

■THE SPIN DOCTORS may be onto something here. Without the aid of synthesizers, digital effects, or even a smidgen of sequenced beats, they are currently pumping out a host of hummable hit songs that have signalled the second coming of blues-oriented rock. Their studio and live albums, *Pocket Full Of*

Kryptonite and *Homebelly Groove*, respectively, recall an era when Steve Miller sang "Take The Money And Run" and the Grateful Dead created their own brand of communal jams.

Now, while the hits keep coming and album sales continue to grow, the Spin Doctors (comprised of Christopher Barron on

vocals, Aaron Comess on drums, Eric Schenkman on guitar, and Mark White on bass) are setting the stage for what is destined to be their biggest tour ever — the MTV "Alternative Nation Tour," with Soul Asylum and Screaming Trees. If past shows have been any indication, fans of the band are in for a wild rock n' roll ride, one that both hippies and yuppies alike can swing, sway, and spin to.

Caught in the middle of this whirlwind of freewheeling riffs and rollercoaster melodies is Jimmy Pettinato, the Spin Doctor's production

manager and lighting designer. In addition to determining what gear will come on board, how the lighting will be arranged, and when to curb the Spin Doctors' stage volume levels, Pettinato must make sure everything runs smoothly no matter where the band is playing. This means quickly adapting the sound configurations from a large, arena setup one day, to a small, packed club the next — not an easy feat.

THINKING SMALL

"It's much harder to manage music in small clubs than in big rooms," says

'70S ROCK NEVER SOUNDED SO GOOD — UNTIL NOW

By JON VARMAN



Spin Doctors Photos by Paul LaRota

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Pettinato, "because the Spin Doctors play really loud on stage, which makes it hell trying to mix the sound. It was especially tough when we had to go back to Europe's clubs after playing 3000-seat rooms in the U.S. It was like taking a three-year step backwards. Imagine carrying 10,000 watts worth of monitors into a small club so that the singer can hear himself over the rest of the gear. From a production standpoint it was a nightmare, but the band had an absolute ball."

While many artists are more than happy to leave behind the gritty clubs that groomed them in their pre-rock glory days, the Spin Doctors have learned to love the small stages that first welcomed them into the world of music. "You can put them on a 12' x 12' stage with a 6-foot ceiling and they will have the best time of their lives," continues Pettinato, "but put them on a stage 80 feet wide and 40 feet deep, with a ceiling 30 feet high, and they'll hate it."

Because of the Spin Doctors' ingrained intimacy during live shows, the equipment decisions that were made by the touring crew had to, above all else, jibe with the group's vibe. "We had numerous monitor problems, because they don't like monitor systems," Pettinato says. "They like to play real close to one another on stage, hearing the music blasting directly from their amps. Basically, we went through 15 monitor

rigs before we found one that they liked, the Rack Systems Audio (RSA)." Other vital elements prescribed for the Doctor's summer tour include a Soundcraft Series 4 console, Mesa Boogie bass heads, and a lighting system provided by Creative Stage Lighting and VariLite.

As far as the sound goes, the Spin Doctors like their music one way: free and clear. In fact, the crew only carries one or two reverbs on the road with them and one Roland digital delay is held in stock just in case the need for one arises, which is hardly ever. As explained by Pettinato, the only reason the PA system is there is for coverage, and when effects must be added, it is done only in the name of necessity. "The bass player, Mark White, hates compressors on his bass, but from a live standpoint, you've got to have them. Compression smooths the sound out a little bit, and you get more gain out of it. As far as the guitarist is concerned, Eric doesn't want anything on his guitars. He likes everything completely flat — no effects, no extras — just the pure guitar sound." Eric Schenkman enjoys his unique guitar sound for good reason: it is a custom-made system his friend built years ago that uses half Marshall heads and half heads of his own invention.

FEELIN' GROOVY

When the Spin Doctors hit the stage, the set list could

IT WAS ESPECIALLY TOUGH WHEN WE HAD TO GO BACK TO EUROPE'S CLUBS AFTER PLAYING 3000-SEAT ROOMS IN THE U.S. IT WAS LIKE TAKING A THREE-YEAR STEP BACKWARDS.

IN A VAN BAND



be thrown out the window. Instead, a free-for-all jam very much like the ones guitarist Eric Schenkman used to see his heroes, Eric Clapton and Jeff Beck, build to a wild frenzy, ensues. Explains Pettinato, "They play everything as it rolls; they change everything right there on the stage — on the spot if they want to. It's definitely feel-oriented from top to bottom." This makes Pettinato's job all the more difficult, since he must always be one step ahead of the band, paying attention to every detail and every movement. When he sees a huddle at the drums, for example, Pettinato knows that the whole set list is about to change and he had better be ready.

"During my first couple of weeks on the road, their 'off-the-cuff' style really caught me by surprise. But now I know to watch out for certain things. For instance if the singer, Christopher Barron, walks over to someone else and begins talking into his ear, it could mean that there's going to be a segue — or there's not going to be a segue. You just have to be alert, because with the Spin Doctors it could go either way."

One way it's bound to go is up. MTV's "Alternative Nation Tour" is currently roaring through Tennessee, New York, Texas,

California, and a multitude of other states, while the Spin Doctors are being hailed as the newest pioneers in a long-awaited live-rock resurrection. In addition to featuring their wild hybrid of retro-rock music on such songs as "Little Miss Can't Be Wrong," "Two Princes," and "Jimmy Olsen's Blues," the Spin Doctors will cart along their trademark lizards, phone booth, and, of course, spins, spirals, and tons of little things that go 'round in the night.

While Pettinato agrees that the Spin Doctors are closely associated with the retro-rock sound of such musical giants as the Grateful Dead and Jimi Hendrix, he maintains that it's just their natural groove. "I don't think they wake up every morning and say 'we gotta write some retro-'70s songs.' That's just what their influences are." In any case, the Spin Doctors' addictive sound is all part of the image the band has honed since their days in the East Village, when a long night of jamming meant playing Nightengale's until dawn. The only difference is that back then they had two vans, two roadies and a huge fan base, while today the Spin Doctors have two buses, two semitrucks, more than twenty roadies, and a fan base that encompasses the entire world. ♪

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LIVE WITHOUT DAT

BAND NAME: Rhythm Method
MUSICAL GENRE: Techno/Progressive Dance

MEMBERS: Steven Oliver and Maurice Oliver

LATEST RELEASE: *The Future EP* (Micmac Records)

WHERE THEY'VE BEEN: Amsterdam — The Melkweg ("The Milky Way"), Paradiso, The Royal Star Theater; New York — Lime-light, The Ritz, The Shelter

WHERE THEY'RE GOING: Europe; currently booking dates in Germany, Holland, UK, and the "Benelux" countries (Belgium, Holland, Luxembourg)

HOW THEY GET AROUND: Plane, train (Eurail), and truck (Ford Bronco)

ROAD CREW: Izzy Ferrante, Driver; Jay Bossert, Tour Manager

SYNTHESIZERS & KEYBOARD RACKS: Kawai K-1 rack (Maurice) and K-1R rack (Steve); Akai VX600 analog; Yamaha TX81Z [2]; Roland D110 [2]; Roland Juno 106; Casio CZ101; Korg mono poly-synth; Roland SH101 analog synth

SUBMIXERS: Phonics 16-channel mixer; Korg 6-channel submixer.

SAMPLERS & DRUM MACHINES: Akai S950 [2] sampler; Roland TR707 drum machine

ALTERNATE CONTROLLERS: Roland Octapad; Roland GR70 MIDI guitar controller; Fender Stratocaster. (Says Maurice, "We call them alternate controllers because they're not keyboards.")

SEQUENCER/SOFTWARE: Atari computer 1040ST w/C-Lab Creator software

ACOUSTIC INSTRUMENTS: Latin percussion conga drums; Latin percussion bongos; Jopa cowbells; assorted African and Brazilian hand percussion; Jopa quica (Brazilian talking drum); pool drainage hose

LOUDSPEAKER SYSTEM: Rental, depending upon which town they're playing.

OUTBOARD GEAR & EFFECTS: Ale-sis Quadraverb Plus [2]; Microverb [2]; MIDI 2 control voltage converter; Furman power conditioner.

BEST LIVE EXPERIENCE: Maurice states: The best show we ever played was the Melkweg in the summer of 1990. The sound was fantastic; it was like being in the grooves of a record. About 2000 people were there and the rave was immense. The Melkweg treats musicians like stars, no matter who they are.

formers were playing on the first floor. The sound was a disaster, because the mixer couldn't even see the stage. He was hearing music that was already absorbed by two floors worth of people in a state-of-rave.

Steve adds: There's no way in hell he could have known what it sounded like, because he was getting the music from a very convoluted angle. The show still went off okay, but it wasn't simply a harrowing experience, it was a horrifying one.

TECH TIPS: Maurice — One thing to know about a live techno show is that you have nothing if you don't have analog synths. Analog gives you the capacity to modify sounds and produce some psychedelic effects, whereas with digital synths, you can't alter the sounds you need to control the crowd. When bringing synths and computers overseas, make sure you watch and protect them with some serious cases. SKB is a safe bet when it comes to protecting your investment. Steve — Explore all the possibilities of what a piece of equipment is capable of doing before you hit the road. If you're playing live techno, it's not even possible to go on tour without knowing your equipment like the back of your hand. Make sure you read the equipment manuals and know your keyboards well enough so that you won't have to open up the instruction manual in the middle of a climactic rave. Also, it's a good idea to make backups of all your computer disks. Be prepared for anything that can go wrong, because it will. Playing techno live without a DAT always has its risks. But it's worth it. ☺

ROAD WARRIORS

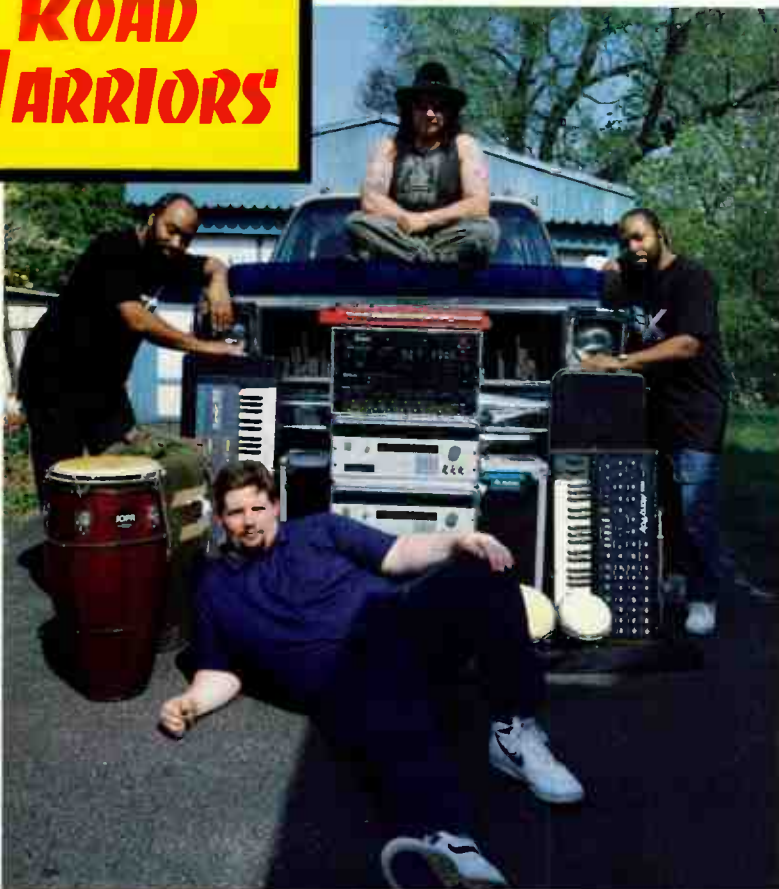


Photo by Peter Monroe

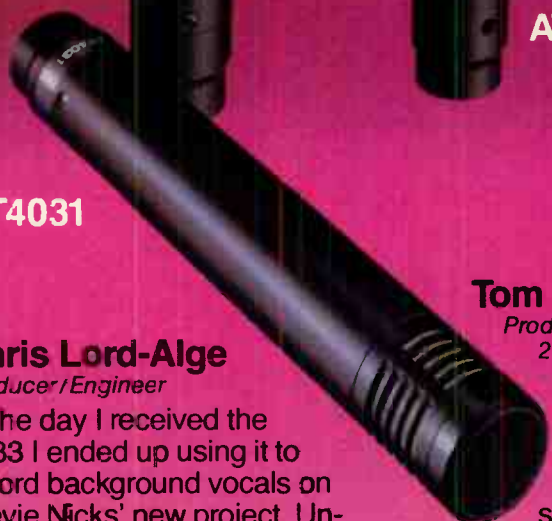
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AT4051



AT4033



AT4031



Tom Lord-Alge (seated), Chris Lord-Alge (standing)

Chris Lord-Alge

Producer/Engineer

"The day I received the 4033 I ended up using it to record background vocals on Stevie Nicks' new project. Unlike large capsule microphones the 4033's upper end doesn't get "peaky"...it is very flat at 3 to 8kHz.

Both the 4031 and 4051 have a beautiful low end...something you don't usually get with a small diaphragm mike. And the 4031 works great when you don't have a lot of room to get in tight on a high hat or piano...it really sounds smooth and airy."

Tom Lord-Alge

Producer/Engineer, 2-time Grammy Winner

"What really knocked me out with the 4033 was that, with a slight adjustment of

the singers, everyone sounded as though they were on axis. With variable pattern mikes, I always feel that I am compromising sound quality when it's out of the cardioid pattern.

The microphones sound very modern. It is like they have a contemporary curve if you will ...for the music that is coming out these days, it seems to be a sound we are all looking for."

Some recent Chris Lord-Alge projects:

- Damn Yankees • Lindsey Buckingham • Stevie Nicks • Poison • Slaughter • Tina Turner • Joe Cocker • Jude Cole • Rod Stewart • 21 Guns

Some recent Tom Lord-Alge projects:

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DEAD ON MONITORING

■WHEN THE national anthem was sung this past April in San Francisco's Candlestick Park, just before the baseball season's opening game, something unusual happened: it sounded really good. The a capella singing was clear, the harmonies were sweet, and that familiar "echoey mess" that is so often the result of perfunctory pregame stadium performances was nowhere to be heard. About 56,000 pairs of eyes and ears were eager to see the Giants vs. the Marlins — but they could have easily been fans of the Grateful Dead, listening to Jerry Garcia, Bob Weir, and Vince Welnick, as they stood near the pitcher's mound singing their one-and-a-half minute rendition of the anthem. When cameras from local TV news zoomed in on the band, a closer look revealed that the singers were wearing some beige colored "earplugs."

In fact, they were wearing wireless Ear Monitors by Future Sonics of Newton, PA — a company specializing in leading-edge technology for stage monitoring.

These and similar monitoring systems, such as C:MAX designed by Circuits Maximus of Columbia, MD, have caused a modest revolution in a critical area of sound reinforcement in the last few years. Many bands have adopted wireless monitor

technology as a permanent component of their live shows. Clients of Future Sonics (all the lads and ladies who had to visit their friend the Ear Doktor) include artists like The B-52's, Ian Anderson, Todd Rundgren, Genesis, U2, and Branford Marsalis.

After an impression of your ears is taken by a registered audiologist, the Ear Monitors are then custom molded to fit you perfectly.



Both hard-wired and wireless receiver belt-packs worn by musicians accept audio comprised of a monitor mix from the single 1U rack-mountable transmitter. For safety purposes, Future Sonics recommends the use of an Aphex 720 dominator II limiter for both systems. Two separate working UHF frequencies are provided per transmitter and per belt-pack for a wireless setup.

A crystal-clear mix transmitted directly to the ears of

the players will eliminate any need for conventional stage monitors such as side fills or wedges. And most important, it will automatically aid musicians in any efforts they make to preserve good aural health. The decrease of overall SPL on stage and the elimination of feedback squeal from traditional monitors creates an ear-friendly environment for every show; even if you toured as often as the Dead,

tremendously improved — there's no "roar" that spills from wedges and side fills into the stage mics and out of the house speakers as just white noise and mud. With the Ear Monitors, the PA can sound almost as clean as studio monitors."

Even though the Ear Monitors have tiny adjustable ports that allow increased monitoring of ambient sound (sound from amps on stage and audience cheers) at the expense of low-end frequency response, Pearson goes one step further to customize the monitor mix so that it matches the acoustical environment in which the band is performing.

"The signal can sound a little dry and unnatural, especially if the ports are closed on the Ear Monitors. So the first step we take in getting the right balance is to pipe the mix through an appropriate patch on a TCM 5000 reverb so that it sounds to them as if the reflections and bounce of the performance space are part of the mix as well."

Operating a live sound system with direct-to-ear monitoring can also alter some shopping habits with gear — especially in the area of microphones. "It's great to pick a mic that just sounds good and to forget about worrying if it'll feed back into the monitors because it's too sensitive. This allows us to experiment with a number of condensers in terms of how good they sound through the PA. We don't have to experiment with eliminating feedback. We've been switching back and forth with vocal mikes,

you would not fry your ears from hearing fatigue caused by high volumes.

Don Pearson (president of Ultra Sound in San Rafael, CA) and his crew have been the Grateful Dead's preferred sound reinforcement company for 11 years. Pearson outlined some of the operations and advantages of Ear Monitors during 27 nationwide gigs with the Dead since the beginning of the year. "In the past, it took us considerably longer to set up the monitor system. But with this new wireless technology, we can use the saved time to concentrate on getting the cleanest sound possible to the audience. The clarity of the PA has

THE GRATEFUL DEAD TAKE TO THE ROAD WITH WIRELESS IN-EAR MONITORING SYSTEMS

BY CAMRAN AFSARI

using both B&K 4011's and Beyer M700's."

Ear Monitors also demonstrates a clear advantage in terms of aiding vocalists with their harmonies and in the alleviation of singing fatigue. Pearson adds, "The harmonies have dramatically improved. The monitor mix can be tailored precisely to feed clean vocals from each singer to the others. If they can hear each other perfectly, their performance can be flawless. Also, a very important benefit is that the singers don't get blasted with loud floor monitors and side fills during a show, which means they don't have to compete and sing so hard over them, so their voices are saved."

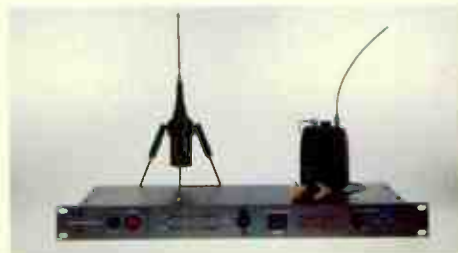
For the Grateful Dead, Pearson and his colleagues have even incorporated this technology into designing a

special communications system between the band members. "An idea that Dan Healy (Grateful Dead's house engineer) had was to use burglar alarm pads, which would normally go underneath a carpet, and place them on stage where each vocalist would normally stand and sing into his mic. If the singers are not standing on these pads, the mics are turned off and won't feed any signal to the board, but as soon as they do stand on them the mics are on and they can sing. Now at the head of these pads I have a little footswitch that cuts the mic signal from going to the PA, but keeps the signal going through the monitor mix loop. So if the band members step on this switch, they can talk through the microphones and hear each other through the Ear Monitors — but their voices won't be piped

through the PA. This allows them to have a conversation between songs. They can decide which song to do next, talk to the sound crew, tell a joke or whatever."

So far, Pearson has experienced only minor problems and received limited criticism of this technology. Nonetheless, he admits that Ear Monitors have revolutionized the way he goes about his sound reinforcement. "At first the drummers were a little hesitant because of the relative lack of frequency response in the bottom end, which they would normally get from speaker monitors set up right next to them. But they soon got used to Ear Monitors and now they even prefer them.

Also, the wireless version, just like FM or any other compressed radio transmission, is somewhat susceptible to the various anomalies in these systems, such as radio interference and so on. But even though they take a little time to get accustomed to for the players and the monitor engineer, the Ear Monitors have made an immense difference. Every band I've worked with that's used them has been converted — it eventually becomes impossible for them to go back."



IN YOUR EAR: Future Sonics Ear Monitors



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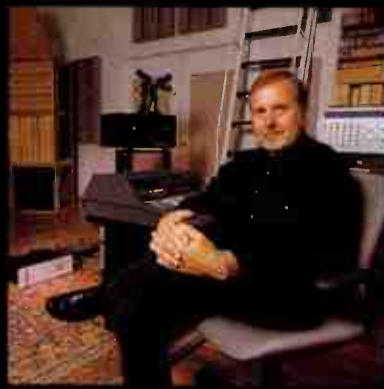
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PATRICK WEBER
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BAND IN A PLANE

■SINCE ITS inception six years ago, my group, Debris, has been the proverbial "band in a van." Performance venues have all been within a 300-mile radius of our home town (Boston, MA), and we just pack all our equipment in one or two vehicles and drive to the gig. So it was with understandable excitement, and some trepidation, that we accepted an invitation from KTRU-FM to perform in their annual Avant-Jazz Festival at Rice University, in Houston, TX. Our first gig out of the time zone! We could leave the van at home this time; we were flying to Texas!

Horror stories of musicians' airline transit disasters immediately sprang into my mind: Neanderthal baggage handlers tossing instruments around like volleyballs, entire band inventories being sent out on the wrong flight, either gear or bank accounts breaking... I was determined that Debris would not be the victim of any such calamities. What follows describes some of the precautions we took, and some of the lessons we learned.

First I became aware of the standard baggage restrictions for domestic



PLAYING IN A TRAVELLIN' BAND IS HARD ENOUGH WITHOUT ALSO FACING THE PITFALLS OF AIRLINE TRAVEL

By BOB ROSS

flights. Then I figured (debated, worried, etc.) how to modify the band's inventory to meet those policies. You are permitted three pieces of luggage per person; you can check all three, or check two and carry one on board the plane. (Some airlines permit two pieces of

carry-on, but the official line from the FAA. is one piece.) Any additional pieces beyond the three-piece limit will each incur a \$45 surcharge, up to the seventh piece, when the surcharge increases \$65. Maximum weight per piece is 70 lbs. If any single piece

weighs more than 70 lbs, but less than 100 lbs, there is a \$45 surcharge for overweight baggage. Anything over 100 lbs cannot be handled by the airline directly, but would have to be shipped via the Air Freight division.

In addition to a weight limit, there is a size limit for each piece of baggage. Total outside dimensions (length + width + height) must be under 62 inches for the largest piece, under 55 inches for the second piece, and under 45 inches for the carry-on luggage. These dimensions are based on a standard matched set of American Tourister suitcases. (American Tourister obviously never made a case for a Kurzweil.) If any single piece has a total outside dimension greater than those limits but less than 80 inches, a \$45 surcharge for oversized baggage applies. If any piece exceeds 80 inches, it has to go by air freight.

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While packing our gear we had to figure all this into the equation. For example, if we combined smaller items into larger cases in order to keep the piece count under the limit, we'd run the risk of exceeding the individual weight limit. I spent two hours trying to cram a bass amp and an effects rack into a tight-fitting flight case, only to find that it topped the scales at 101 lbs.

Conspicuously large cases would immediately qualify as oversized and incur a toll or have to go air freight anyway. And if we decided to accept the inevitable and use air freight, we'd have to plan for an extra trip to the airport to get it onto an earlier flight. (Paranoid visions of our tempting cache piled on an unattended loading dock for half a day, as well as the cost, made us strive to steer clear of this option.)

Our solution was to talk the promoter into providing

CIRCLE 43 ON FREE INFO CARD



most of the unwieldy gear (drums and speaker cabinets), leaving us to creatively pack the remainder of the smaller gear in a way that would not exceed the maximum piece count or the weight limit. If you get the luxury of a promoter who will provide gear you request, doublecheck the equipment rider after it's been sent out to make sure the promoter understands exactly what you've requested. Then, before you've hopped on the plane and it's too late, triplecheck that the promoter has actually acquired the equipment you requested, or at least something compatible.

To avoid confusion about all our bags and cases, we designated one person Equipment Monitor: someone responsible for keeping track of every piece

of baggage. The Equipment Monitor carried a master packing list, with every bandmember's bags and cases numbered and their contents listed. The luggage was then numbered accordingly and conspicuously so that at every step of the process (e.g., when reaching the airport from our rehearsal space, or upon collecting our gear after the plane arrived in Houston) the Monitor could do a quick spot check to make sure our inventory was still intact. Being already entrusted with a task of utmost importance, it was decided that the Equipment Monitor would also be responsible for keeping everyone's tick-

ets and boarding passes. Having one person be responsible for these worrisome logistics simplified the routine and took the pressure off everyone else. (Naturally, that person was me.)

The general rule about carry-on baggage is that it must fit either in the overhead compartment or under the seat in front of you. Occasionally you can sneak a larger object into the closets designed for hanging garment bags. Be aware that these closets fill up early;

don't count on this space for stowing your gig bags, especially if you're seated toward the front. Planes generally board the rear-most seats first. It's a good precaution to call ahead and find out exactly what sort of plane you'll be flying in, as this can tell you the size of the available storage spaces. The guitars and saxes we stowed in the cavernous overhead compartments of a 727 on the first leg of our trip barely squeezed into the cramped overhead bins

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of a DC-9 on our return trip. Airlines can be pretty fussy about checking improperly packed baggage. They seem especially wary

of cardboard boxes and nonstandard shapes. If any package is suspect, you may be asked to sign a waiver absolving the airline of any

responsibility should the equipment be damaged in transit. The only sure way to avoid this scenario is to use shipping cases that meet Airline Transit Authority (ATA) Spec 300. (Note: Despite the claims of certain manufacturers, there is no such thing as an "ATA-approved" case. The ATA only provides design criteria and a series of tests that a case must pass in

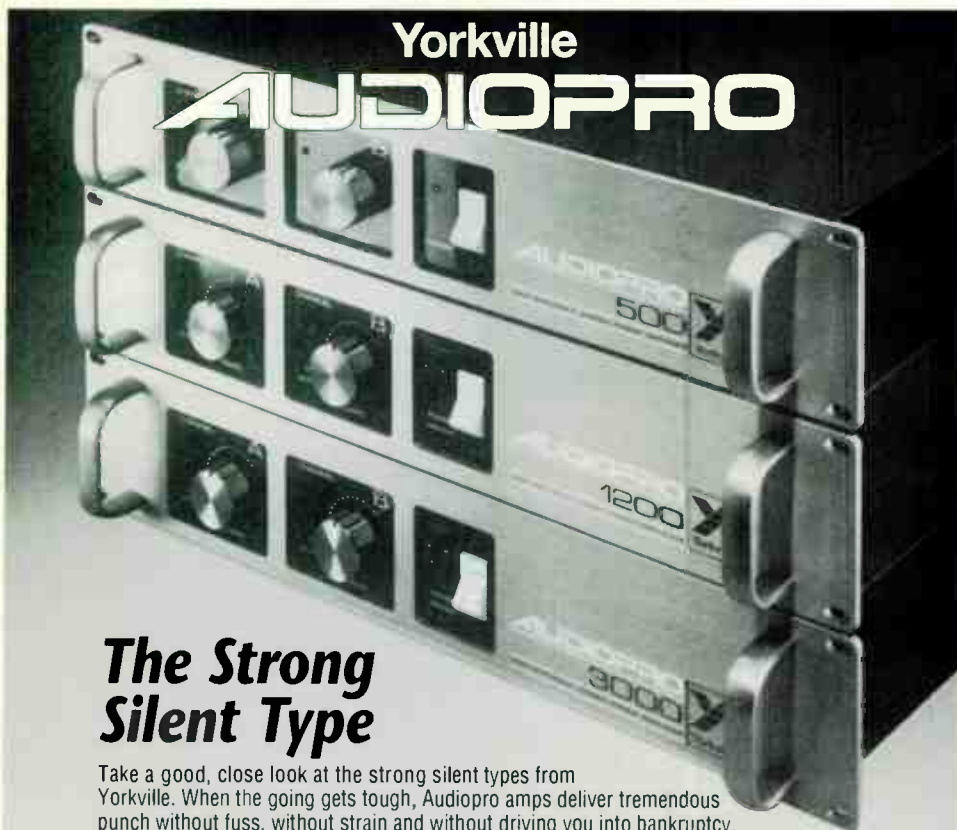
order to meet the specification. It is up to each manufacturer to document the test data demonstrating a case's compliance with that spec. This is of utmost importance should a piece of equipment be damaged in shipment; if the quality of a case's construction cannot be officially substantiated, the airline will take no responsibility for the damage.)

Anvil Cases (15650 Salt Lake Avenue, City of Industry, CA 91745) is the best known source for heavy-duty musical instrument shipping cases meeting ATA Spec 300. While these mil spec cases are the best insurance against equipment destruction, they can also be somewhat pricey. In our continuing effort to fly safely and cheaply, I used some do-it-yourself alternatives: Arpro® expanded polyethylene foam planks (available from Tri-Tech Group, Inc., 82 Alden Road, Concord, MA 01742) were assembled into formfitting containers using conventional hot-melt adhesive, then bound in fiberglass.

While these cases do not meet ATA spec, they are one-third the weight and cost of an equivalent commercial flight case. I personally witnessed my bass guitar, packed in one of these custom cases, drop from a forklift and bounce across the tarmac with no damage, a tribute both to the case's structural integrity and to the apocryphal reputation of airline baggage handlers.

I'll spare you the warnings about airline food and jet lag. They're part of the whole milieu of being a traveling band. Suffice to say we got to the gig and back in one piece, and we'd do it again in an instant even more confident that next time it would be safe, affordable, and fun. ☺

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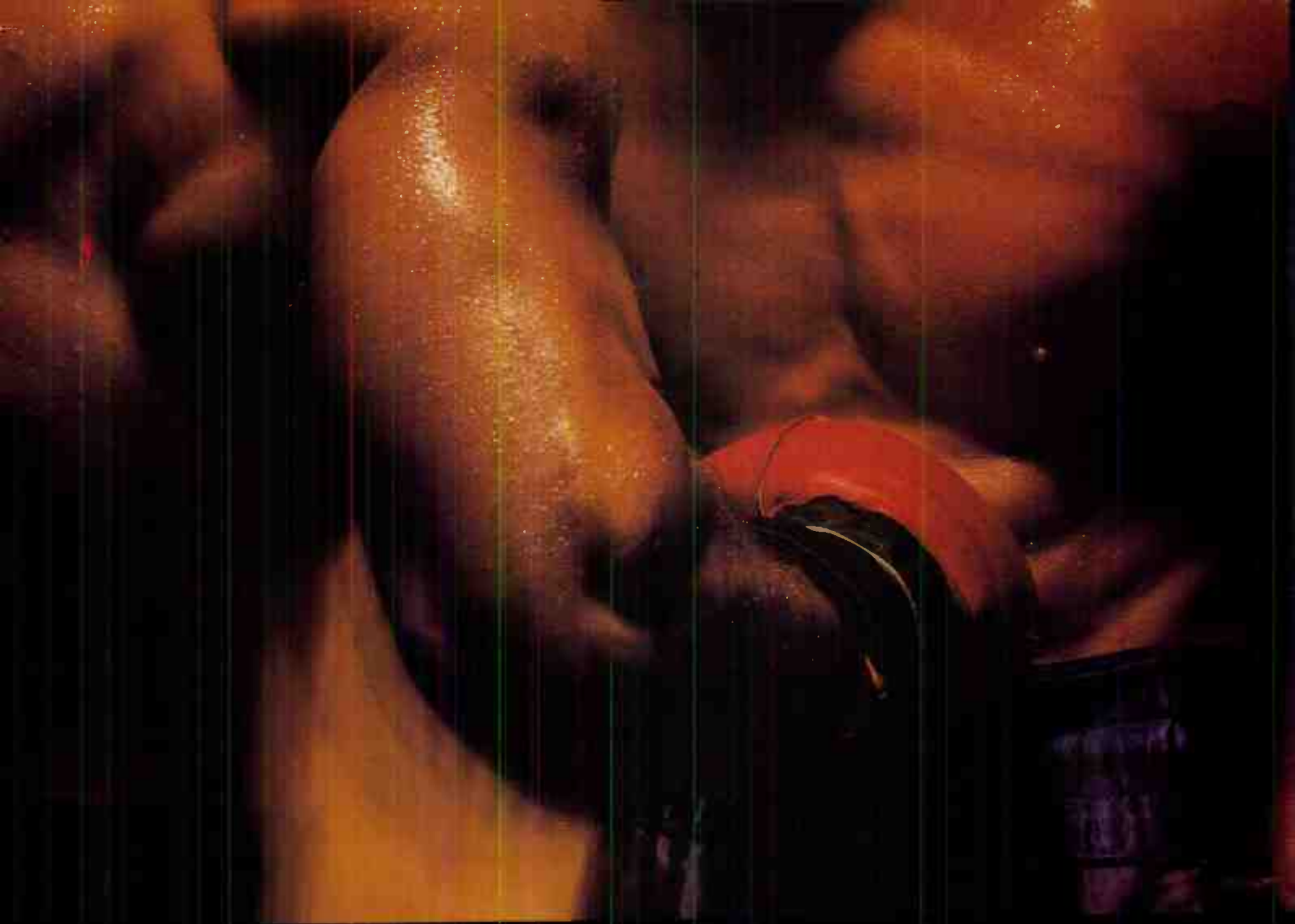
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APPEASING THE “GODS OF POWER”

■WHEN HITTING the road for the first time, many bands make the mistake of bowing down to the “gods of power.”

Thinking “the louder the better,” they set out with a myriad of equipment that inevitably includes large power amplifier racks that dramatically increase set-up time, not to mention their taxing the muscles considerably. But more amplifiers don’t necessarily provide better (or louder) sound, and the time and effort needed to haul and set them up at a show can be cut drastically with the right approach.

While playing the Road Warrior scene in the early/mid-’80s in the Kansas City area, I was lucky (?) enough to be entrusted with managing our sound equipment. We were using Carver amps and custom JBL boxes, usually for shows of 300-400 people.

It would take four of us nearly two hours just to load

our van before heading off to the gig, where it would then take roughly three hours to get everything unloaded and set up. A lot of battles were fought along the way, and I ended up learning some valuable lessons that now apply to our rental system business.

Our first priority: design simple amplifier racks that would handle all power needs while minimizing setup and takedown time and effort.

CABLE READY

One thing readily apparent, even in my band days, was to simplify cable runs, making them as straightforward as possible. I also found that installing a custom patchbay on the front of our amp racks, labeled clearly for input and output, simplified things to the point where even stagehands (when available) could provide valuable help. Our racks

have evolved to a point where all inputs, outputs, and even the 220-volt, 50-amp AC connectors are on the front patch bay.

This decreases set-up time and simplifies connections, but because there is no reason to access inputs and outputs on the rear of the amps, the back of the racks don’t need to be opened, creating a potential for amp overheating problems caused by a lack of ventilation.

Evaluate this potential problem very carefully: one solution is to outfit your racks with small ventilation fans to keep things cool.

We evaluated every viable amplifier option in our pursuit of smaller and lighter racks. And like almost everyone else in this business, we also were paying very close attention to cost.

But step away from the cost issue for moment. Look instead at an amp from a

“watts per dollar” standpoint — that is, what are you getting for your money? Reliability, of course, is another issue to consider.

Through the years, both Daryn and I have had experience with Crown amps, and while we were very impressed with their performance, we were also under the impression that they were just too expensive for a limited budget.

During the evaluation process, we found this just wasn’t the case. Even at lower power levels, Crown provided more headroom and dynamic range than any of the dozen or so other amp models we looked at.

A DEVELOPMENT PROCESS

We took a very flexible approach to designing our racks. Our two main racks, in 14-space cases, housed a total of four Crown Macro-Tech MA-2400’s and a single MA-1200. At four ohms, each of these racks delivered a minimum of 3700 watts — more than enough to drive a full-range concert speaker system for venues of 5000 or even more. Total weight of these racks barely exceeded 250 pounds.

A few supplemental racks containing just MA-2400’s were also designed to supply extra “oomph” for shows requiring more speakers.

With great interest, we evaluated the Crown MA-3600VZ when it was introduced a couple of years ago. At two ohms, the MA-3600VZ delivered more than 1800 watts per channel — more than double the power of an MA-2400. We quickly surmised that two MA-2400’s could be replaced by a single MA-3600VZ that would take up less than half the space while weighing only 55 pounds.



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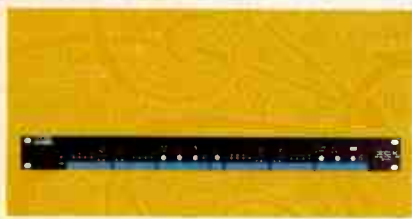
At 100 times its size, you can see the immense number of micro-circuits on the A.R.T. superchip. Each handles an audio function.



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(HUSHNews Special Report)

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channels of single-ended noise reduction in a single rack space, the PRO HUSH which is the world's first MIDI-programmable single-ended noise reduction system and the HUSH I.S.P., which combines dynamic enhancement, audio level compression and intelligent noise reduction with V.I.R. (variable integration release). This is true cutting-edge audio. And HUSH Systems will send you their free brochure when you send \$2.00 for shipping and handling.

COVER STORY

HUSH Systems provides newest technology with HUSH Elite™

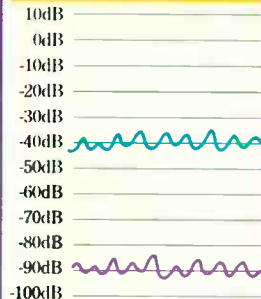
"No other noise reduction unit on the market can match the performance of the Elite..."

(U.S.A. HUSH News) – HUSH Systems latest entry in the noise reduction field, the new HUSH Elite, is a professional stereo single-ended noise reduction system that combines the most effective real time HUSH Systems technology with the ease of an "Auto" mode providing hands-free operation. Selection of the "Auto" mode will select the optimum filter and expander thresholds, filter cut-off points and release times, all of which will automatically change based on the audio source. Of course, as with other HUSH System's designs, the dynamic filtering is coupled with an expander circuit. The HUSH Elite's broad band expander also incorporates HUSH System's incredible VIR™ (variable integration release) circuit which tracks the envelope of the audio so as to provide the release time required based on the audio. No other noise reduction unit on the market can match the performance of the Elite with an 18dB per octave low pass dynamic sliding filter, and a sliding high pass filter. LED metering includes bandwidth for high/low band filters and gain reduction indicating the amount of expansion. Please see COVER STORY inside page 4

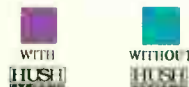
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QUIET TIMES PROJECTION



NOISE FLOOR





CROWN-ING ACHIEVEMENT: This rock pocks lots of power.

Further space and weight savings subsequently came when Crown introduced the MA-5000VZ, which provides a whopping 2500 watts per channel at two ohms. To power our main system, made up of 60 proprietary cabinets (Renkus-Heinz and RCF loaded), we devised two 16-space racks, each made up of a single MA-5000VZ, three MA-3600VZ's, and a single MA-1200. More than 16,500 watts are provided from a highly transportable package weighing less than 300 pounds.

Two of us can have this large-scale system up and running in less than two hours — and with much less pain to our aching backs.

During this main system development process, another goal was to devise relatively light, efficient power supplies for smaller venues and needs.

A three-way system has been developed for 350-400 seat venues. Low frequencies are provided by four cabinets, each containing an 18-inch woofer, while mid and highs are handled by two double-15 cabinets, each outfitted with a two-inch horn.

We drive the low boxes with one channel of an MA-3600VZ (1800 watts), and the mids with the other MA-3600VZ channel. Highs are driven by a Crown 460 CSL amp that delivers 230 watts at four ohms. This rack, mounted in a carpet-covered plywood case, has handles that allow it to easily be carried by two people (or even one herman).

A two-way system for clubs of about 200 people is made up of four low-frequency cabinets and two boxes with single 15's, a one-inch horn, and a passive crossover — all driven by a single MA-2400. Obviously, this system takes up very little van space, and can be loaded in and out within a matter of minutes by only two people.

In fact, we keep this system loaded in one of our company vans, allowing us to just hand the engineer the keys, and he's on his way!

The concept of increasing usable power via smaller, lighter amplifiers, however, has certainly paid off for us in terms of time, money, and space savings. It's also a far less painful way to supply sound that you can be proud of. ☺

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EQ JUNE 85



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Eastern Acoustic Works' (EAW) compact JF Series of high definition ultra-compact systems can be taken on the road, or installed



whenever design considerations require an unobtrusive system that is aesthetically appealing and does not detract from architectural details. Proprietary waveguides and purpose-designed woofers optimize power response across the operating bandwidth. For extended bass output, JF Series systems are compatible with EAW subwoofers. The latest additions to this expanding line of portable/permanent systems are the JF260 (12-inch cone) and KF560 (15-inch cone). Both use a 2-inch compression driver coupled to a 60 degree constant average horn. For complete details, contact EAW, One Main Street, Whitinsville, MA 01588. Tel: 508-234-6158. Circle EQ free lit. #111.

TESTING 1, 2

Ideally suited for large acoustical environments such as auditoriums, theaters, and concert halls, Techron's ELR (Early-to-Late-Ratio) measurement

software is designed to allow you to predict the clarity of your music. ELR software makes a series of automated octave-spaced energy time curve (ETC) measurements from which early/late sound energy ratio values are calculated in the period between 20 ms and 200 ms after the arrival of the direct sound. The program performs both short and long ELR tests — the short ELR test makes octave band measurements centered on 500 Hz, 1 kHz, and 4 kHz, while the full ELR test adds the 125 Hz and 250 Hz octaves. The resulting data is displayed both with and without the initial signal and shows the ideal (theoretical) curve for comparison. In addition to

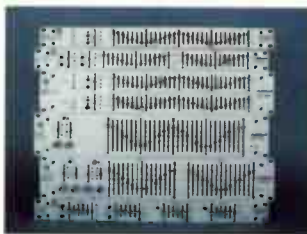


Techron's Early to Late Ratio (ELR) software automatically makes a series of Energy Time Curves and displays the data in composite form. Resulting data is shown both with and without the direct signal and allows the ideal curve for comparison.

providing a quick analysis tool for determining intelligibility and clarity, ELR measurements are helpful in rating source/receiver relationships and troubleshooting problematic conditions. The new ELR software retails for \$250. To get the right sound, contact Techron Division, Crown International, 1718 W. Mishawaka Rd., Elkhart, IN 46517. Tel: 219-294-8300 Circle EQ free lit. #112.

RIGHT ON Q

Furman Sound has introduced a new line of high-performance graphic equalizers designated the "Q-series." There are six models. The Q-151 and Q-301, dual 15-band and single 30-band models, respectively, use 20mm sliders and



are housed in a single rack space chassis. The Q-602 is a dual 30-band model using 20mm sliders in a double rack space chassis. The Q-152 and Q-302 use extended travel 60mm sliders in double rack space chassis. The sixth member of the series, the Q-541, is a special purpose model featuring four channels of 5-band stereo equalization. All feature constant-Q equalization for the truest graphic representation of the actual response curves. All EQ bypass switches use "straight wire" routing via high-quality relays to assure that audio will not be lost even in the event of equipment failure or power outage. For complete information, contact Furman Sound, Inc., 30 Rich Street, Greenbrae, CA 94904. Tel: 415-927-1225. Circle EQ free lit. #113.

GLASS SMOOTH

Sennheiser is introducing the MD515 and MD516 dynamic microphones as part of its new ProForce line. The MD515 is a dynamic supercardioid



microphone constructed of a new high-tech glass composite. This material is extremely durable and is built for the rigors of the road. In addition to added durability, the MD515 greatly reduces handling and cable noise. A unique Spring Capsule Suspension System (SCS) along with an "active mass" eliminates any remnant handling noise. Engineered for live performances, the MD515's supercardioid polar pattern is a very warm sounding microphone over the entire frequency range, according to the manufacturer. The MD516 is identical to the 515, with the addition of a noiseless on/off switch. For more information, contact Sennheiser, 6 Vista Drive, Post Office Box 987, Old Lyme, CT 06371. Tel: 203-434-9190. Circle EQ free lit. #114.

AT THE PEAK

QMI has announced the release of the new Drawmer DL441 Quad auto Compressor/Limiter. The DL441 captures four channels of Drawmer's DL241 Auto Compressor and variable peak level section in 1U of rack space. Accord-



WHAT DO ALL THESE PRODUCTS HAVE IN COMMON? THEY CAN ALL HELP YOU BRING DOWN THE HOUSE AT YOUR NEXT SHOW.



ing to the manufacturer, the DL441 provides exceptional dynamic control in the minimum amount of setup time. Features include: switchable hard/soft knee compression with ratio control in both modes; auto attack and release to constantly follow the dynamics of the signal and preserve transients without allowing excessive peaks to occur; and peak level control, adjustable between 0 dB and +16 dB, utilizing Drawmer's "Zero Time Response, Zero Overshoot" circuitry. The unit is switchable for +4 dBu or -10 dBu operation and uses balanced XLR inputs and outputs. Price is \$1149. For further details, contact QMI, 125 South Street, Hopkinson, MA 01748. Tel: 508-435-4243. Circle EQ free lit. #115.

MIGHTY MOUTH

Jamm Electronics is a newly formed company that has introduced its first product — the Mighty Mouth. It allows for studio-quality vocals during rehearsals, using headphones instead of speakers with absolutely no feedback. When connected to guitar amplifiers, it becomes a powerful 4-channel PA, with little or no feedback. In recording applications, it can be connected to a 4-track recorder to put any combination of four vocals or instruments on one track; and it can be connected to



the output side of a recorder to allow four musicians or singers to hear what is being recorded as it happens. It's capable of driving 4- or 8-ohm loads and frequency response is 5 Hz to 20 kHz. List price is under \$350. For more details, contact Jamm Electronics, P.O. Box 7040, Newburgh, NY 12550. Tel: 914-566-1843. Circle EQ free lit. #116.



drivers. The 381-SDM is operable between 50 Hz and 20 kHz, and features a sensitivity of 102 dB at 1 watt/1 meter. The loudspeaker utilizes a 15-inch woofer to supply low-end reinforcement up to 800 Hz, at which point a 40 x 90 constant directivity horn coupled with a compression driver takes over to manage mid-range frequencies. Frequencies above 8 kHz are directed to a high-frequency exponential horn. Suggested retail is \$850. For more details, contact TOA, 601 Gateway Boulevard, Suite 300, South San Francisco, CA 94080. Tel: 800-733-4750. Circle EQ free lit. #117.

LOW PROFILE

The new 381-SDM is a compact, roadworthy 3-way stage monitor from TOA. Power handling capacity is rated at 360 watts continuous program. The 381-SDM features a unique slotted faceplate which functions as an acoustic low-pass filter to ensure flat response and a smooth transition between the low- and high-frequency

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FENDER-SUNN SPL-9000 POWER AMP

■WE USUALLY associate the name Fender with the Stratocaster and Twin-Reverb. I've had both of these serve long and difficult lives in clubs and studios without ever letting me down. That

Fender name instills a warm feeling every time you see it, especially if you're sitting on a Twin-Reverb....

Fender is now very serious about being a major manufacturer of pro audio

equipment. The new Fender-Sunn SPL-9000 power amp definitely shows the company was listening to sound reinforcement system operators when updating the Sunn-7450 to include new features and packaging.

The SPL-9000 is specified to produce 450 watts into four ohms in two-channel mode and 900 watts into eight ohms in bridged-mono mode. Currently the largest pro audio power amp made by Fender, the SPL-9000 is capable of driving two-ohm loudspeaker systems in two-channel mode and loads of eight ohms or more in the bridged-mono mode.

I did a few measurements with the Techtron TEF 20HI and found the frequency and phase response, signal-to-noise ratio, and distortion levels to exceed Fender's specifications, producing a very respectable amp for any SR or studio application. The amp's sound quality cannot be faulted and the SPL-9000 includes reasonable band-limiting, output-short, and over-temperature protection. None of the protection circuitry or band-limiting

seems to affect the sound quality of this amp, which remains extremely well behaved throughout the audio band.

The mechanical design of the SPL series shows that Fender has considered the disaster stories told by many sound-reinforcement touring companies. This tour-ready amp includes a heavy-gauge steel case with front and rear rack-ears, big knobs, bright indicators, a ground-lift switch, and forced-air cooling. The two-speed fan is a little too noisy for applications where the unit would be near the audience.

The front panel looks somewhat industrial with the cooling intake air-filter across the top. Underneath are two detent-style input attenuators, and beside each of these knobs are signal status and clipping indicators. The clipping indicators operate quickly enough to be helpful in alerting the system operator of impending clipping distortion before the audio quality lets the audience in on it. The indicators labeled SIGNAL are a bit confusing. We have become so used to LEDs
continued on page 104

ROAD TEST

MANUFACTURER: Fender Musical Instruments, Pro Audio Products, 7975 N. Hayden Rd., Scottsdale, AZ 85258. Tel: 602-596-7121; Fax: 602-596-1384.

APPLICATIONS: Professional sound reinforcement power amplifier.

SUMMARY: A thoughtfully packaged professional amp that doesn't trade audio quality for price.

STRENGTHS: Very good audio performance; connection options make it easy to re-configure and adjust.

WEAKNESSES: Cooling fan noise will limit amp's location; confusing labels for signal indicators and mode switches.

PRICE: \$930

EQ FREE LIT #: 118



BY WADE MCGREGOR





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Studio photo courtesy of: Recording Arts, Nashville, TN.

MIDI and Computer Tips

Beat those bugs and get the most out of your MIDI setup

BY DAVID FRANGIONI AND CRAIG ANDERTON

When your MIDI isn't interfacing, your software goes soft, and your sampler gives you a blank disk instead of a blank stare, maybe you've fallen prey to a micro-processor-based gremlin. What follows are some tips that can help save your sanity (or at least a session).

- An Akai S1100 with 45 MB removable drive works best with software versions 1.32 or 2.02 (or higher); version 2.00 produces an error with 45 MB drives. Also, set the Optical Drive sector size to "512b" (located on "DISK" page F5). Whether or not you use an Optical Drive, the S1000/1100 will not properly recognize a 45 MB drive if the sector size is set to "1kb."

- ADB (Apple Desktop Bus) and RS-232 (a low-speed serial interface) are the protocols for connecting desktop devices (mouse, keyboard, etc.) to a Mac or IBM, respectively. Although there are some music-related items that utilize these ports, such as the JLCopper Media Station, the appropriate software is needed for these peripherals to communicate with the computer. For example, either the Media Station needs software that will allow it to work with different sequencers (or

whatever) or your software has to directly support the Media Station.

- Before buying a new piece of equipment (especially software), call the developer to make sure that the gear works with what you already own. Whenever there are incompatibilities with software you should wait until they are fixed; because of the amount of time it takes to update software (never mind hardware), it could be months before the manufacturer releases the version needed to make your system fly.

- With Opcode Vision/StudioVision versions prior to 1.32A, set the high range in "Instruments" (opt-I) to G-8 (it defaulted to C-7, and quite a few users couldn't understand why they couldn't play notes higher than C-7). Version 1.40 (and higher) defaults to G-8 to cover the full MIDI note number range.

- Some users think that the "Remote Controls" feature in Mark of the Unicorn's (MOTU) Performer is quirky. Usually the problem is not realizing that the Caps Lock key affects these controls. For example, if you defined "0" as your stop key, then 0 will stop the sequence only if "Caps Lock" is not down. Otherwise the pro-

gram will think you're pressing "0" instead.

- When using an Opcode Studio 5 or a MOTU MTP I or II with Alchemy, set the MIDI interface in Preferences (command P) to MIDI Time Piece. Studio 5 users should also verify their MTP Emulation mode settings.

- Although virtually every piece of MIDI gear has some related delay, the Akai S1000 and S1100 have one parameter that can affect the delay. "Note On Sample Coherence" (in Edit Program) sets whether stereo samples play in phase or not. When on, the sampler waits for the samples to be in phase before playing the note. This creates a noticeable delay, which you can compensate for in most cases by using a sequencer's Track Shift command to advance the data slightly. Turning off Sample Coherence improves the timing, but stereo samples will play back out of phase. For mono samples, set this parameter to off.

- If your sequencer doesn't seem to sync to SMPTE with the MIDI Time Piece, remember that there are often two variables involved. The sequencer may need to specify which port (modem or printer) to look at for



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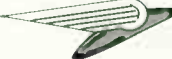
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CIRCLE 13 ON FREE INFO CARD

WORKSHOP MIDI



CHECK YOUR MODES when using Opcode's Studio 5 with Alchemy.

timecode, while the MTP's MIDI Sync menu routes timecode to one or both ports. The sequence and MTP need to agree on which port will be used for timecode.

- If you use MIDI volume (controller 7) in your sequences, create a one-measure file that sends MIDI volume 127 on every channel. Run this at the start of a session, since it's easy for an instrument to be turned down from a previous volume command yet there's usually no way of knowing this by looking at the instrument.

- When doing synthesizer voice editing, disable incoming program changes. This prevents a program change from calling a program and trashing your edits.

- If you own a Mac, download MidiScope (a software MIDI analyzer that shows what's coming into your interface) from PAN or similar bulletin

board services. A simpler alternative is the shareware program Laurie Spiegel's MIDI Terminal. It's also available from bulletin boards and user groups.

- MIDI devices can often be miraculously "repaired" by reinitializing the unit. This unscrambles the microprocessor's brain, but will also wipe out any user settings. (You do back things up, don't you?)

- If you're sequencing and start to edit a patch on your master keyboard and it goes insane, you may have a MIDI feedback loop. If MIDI thru is on at the sequencer, turn off local control at the synth, and vice-versa.

- Sometimes you want a stuck keyboard note so it can serve as a signal generator (e.g., for setting levels). You can always tape down the key, but you can also send a note-on to the keyboard, then disconnect the keyboard's MIDI in.

EQ

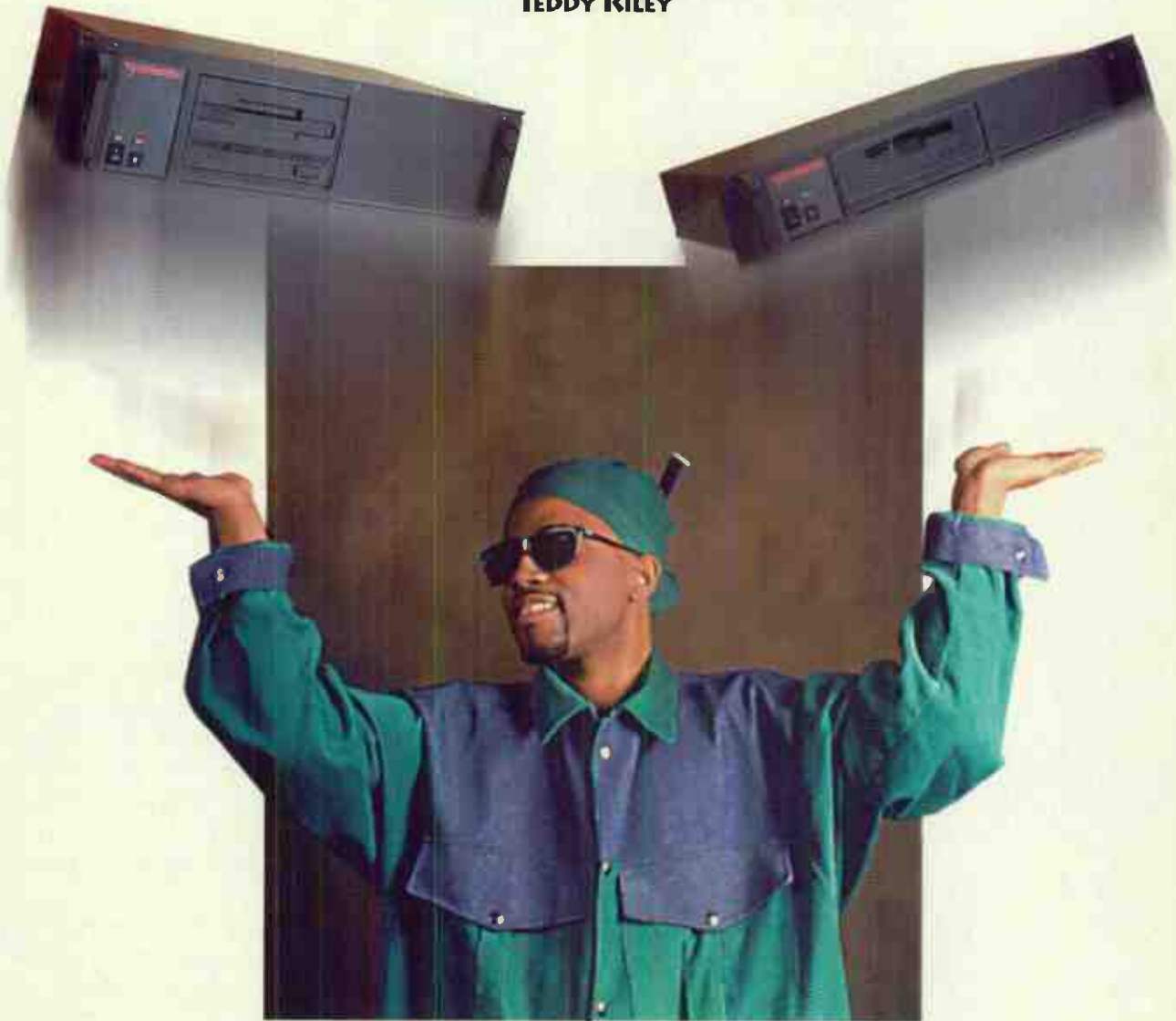
MIDI WIDGETS

If you have to troubleshoot your MIDI system often, the palm-sized Studiomaster MA36 MIDI Analyzer could save you a lot of time. (Studiomaster, Inc., 3941 Miraloma Ave., Anaheim, CA 92807. Tel.: 800-878-7883.) There are LEDs to indicate 36 different types of MIDI data (including Active Sensing, Tune Request, Channel & Poly Pressure, MIDI Clock, Pitch Wheel, System Exclusive, and Control Change) and 16 LEDs to indicate channel. Since the unit has MIDI In and Thru, it can be left in-line at all times if needed. Although quite a few keyboards have built-in analyzers, have you ever tried to balance yourself on the end of a mixing console to test MIDI connections with a 60-pound keyboard in your hand? If so, you'll love this unit.

For merging two MIDI outputs to one output, the Voice Crystal MIDI Merger does the job but has a few extra features. (Eye & I, 2520 Rose Way, Santa Clara, CA 95041. Tel: 800-726-7664.) In addition to merging the data of two MIDI devices to one output, it has an LED that flashes when data is passing through and an All Notes Off Reset switch to silence stuck notes. This unit was tested in all kinds of situations (including large System Exclusive transfers) and it performs reliably. No power is required, as it draws its power from the MIDI line. A similar, somewhat more basic merger is Anatek's MIDI merger (Anatek, 400 Brooksbank Ave., North Vancouver, B.C., V7J 1G9, Canada. Tel: 604-980-6850.). Perhaps the most cost-effective answer comes from MIDI Solutions (800-561-MIDI; outside U.S. 604-794-3013), whose \$59 MIDI merger is compact and does the job well.

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Photo By Ron MacDonald

General MIDI: Ally or Enemy?

General MIDI is going to make millionaires of us all!" "General MIDI is going to sap all the life out of music!" "General MIDI is leading the charge into Baghdad!" Well, maybe you haven't heard the last statement, but you probably have encountered the others at some trade show or on a computer bulletin board. When people have opinions about General MIDI, those opinions tend to be pretty strong. But where's the truth? Is General MIDI a boon, a bust, or just a buzzword?

No one is pretending that General MIDI is single-handedly going to save the music industry, but it could provide a healthy shot in the economic arm to those smart enough to take advantage of it. That's because it can help open new markets for all of us in the music industry. But before we explain how, let's take a look at exactly what General MIDI — GM, to its friends — is.

When you start playing a new synthesizer, you have no idea what sounds are in its program memories. You either look in the manual or (especially if someone else has been programming it) hunt and peck to find the sounds you want. This is fine if you're a professional musician looking for new sounds, but what if you're an amateur musician? You may want to be able to buy MIDI songs on disk that others have created, and have them play back with the right sounds regardless of what synth you're using. Or perhaps you're a game manufacturer who wants to use MIDI music, but doesn't want to worry about being compatible with the hundreds of different synths and sound cards on the market. General MIDI is aimed at you, and millions more.

General MIDI is a "Recommended Practice," added to the MIDI

Specification. No manufacturers are required to include General MIDI in any products, but if they do, they must implement it according to the Recommended Practice. It doesn't change the way an instrument responds to MIDI data — it just defines that response more tightly.

When a sequence that has been created for a GM instrument (a "GM score") is played on a GM instrument, all the different tracks will play with the correct instrumental sounds. It doesn't matter if the box used to create the score and the one used to play it come from different manufacturers, the sequence will sound right. This is because every General MIDI instrument has to follow three main guidelines: a program map, a drum map, and channel assignment.

Program map means that when you send a particular program change command to a GM synth, you know what sound the synth will play.

Program change number 1 always calls up a grand piano, number 23 always calls up a harmonica, and number 72 is always a clarinet. All told, there are 128 sounds defined in the General MIDI program map. These are divided into 16 groups, including pianos, guitars, basses, strings, reeds, pads, percussion, and sound effects.

In fig. 1, the categories into which the General MIDI Program

Map is divided, with examples of each category.

Drum mapping avoids the problem of different drum machines using different MIDI notes to play their sounds. A GM instrument always puts a bass drum on MIDI note 36 (a C note two octaves below middle C), an elec-



Listen up troops!

General MIDI is here for inspection!

BY PAUL D. LEHRMAN

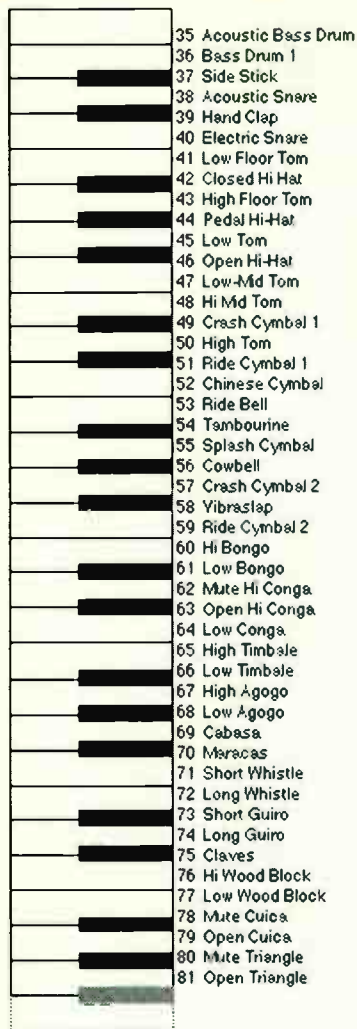


Figure 1

FIGURE ONE: GENERAL MIDI PROGRAM MAP

1-8	Pianos	(acoustic, electric, clavinet)
9-16	Chromatic Percussion	(celeste, vibes, xylophone)
17-24	Organs	(Hammond, church, accordion)
25-32	Guitars	(nylon, steel, distorted, harmonics)
33-40	Basses	(acoustic, electric, slap, synth)
41-48	Strings	(solo violin, cello, pizzicato, timpani)
49-56	Ensembles	(strings, voices, orchestra hit)
57-64	Brasses	(trumpet, French horn, brass section)
65-72	Reeds	(saxes, clarinet, oboe, bassoon)
73-80	Pipes	(piccolo, flute, bottle, whistle)
81-88	Synth Leads	
89-96	Synth Pads	
97-104	Synth Effects	
105-112	Ethnic	(sitar, banjo, koto, kalimba)
113-120	Percussive	(bells, steel drums, woodblock, tom-toms)
121-128	Sound Effects	(Fret noise, bird tweet, telephone ring, applause)

When a sequence for a GM instrument is played, all of the different tracks will play with the correct instrumental sounds.

tronic snare on note 40, a tambourine on 54, and so on. Forty-seven individual percussion sounds are defined and assigned to keys in the map. The channel assignment requirement is very simple: Use any MIDI channel you want for any sound you want, but key-based percussion — the drum map — always goes on Channel 10.

There are some other requirements. A GM instrument must be multitimbral and able to receive data on all 16 MIDI channels, and it must be able to play 24 sounds at the same time. It also must respond to pitch bend and a few standard controllers such as modulation, volume, and pan.

Something that is deliberately not part of General MIDI is anything about how the sounds are made. GM instruments will range in quality and complexity, from a two-operator FM-synthesis chipset in a portable game machine to a weighted-action keyboard with 8 MB of samples in ROM. As long as it meets the program map, percussion map, polyphony, and controller requirements, it's a General MIDI instrument; a General MIDI score should be entirely recognizable when played on it.

Of course, manufacturers will still be motivated to strive for better sound quality, because that's what will sell instruments. But don't worry about synth makers "dumbing down" their

professional products because of GM: programmable gear will always have a market. But you will start seeing high-end synths that have a GM program map built into ROM as a small subset of their memory so that pros can write GM scores on familiar equipment.

Why bother with all this? Because after ten years there are still some areas that can benefit from MIDI music, but that MIDI has not been able to penetrate. Those potential users perceive MIDI as too complex to deal with, and indeed, asking a non-musician to get involved in custom program lists, sys-ex dumps, and drum maps is asking a lot. General MIDI makes all that go away, and makes it ridiculously simple to play MIDI music. You buy the music, play it into the synth, and voilà.

Who will use that music? Multimedia producers need music for their presentations, and there is a growing market for MIDI "clip tunes" aimed at producers. Educators and amateur musicians will be eager to buy play-along pop tunes, interactive music lessons, or "Music Minus One" classics. By adopting GM, game makers can transcend the current situation in which different files for dozens of incompatible sound cards and synths must be created for every program, and can at the same time increase the dramatic power of their products.

Who makes the music? You do. Musicians are needed to create the General MIDI scores — and if you've been doing well in cable or industrial television, wait until you see how many desktop multimedia hackers are going to be out there soon. Who else benefits? Hardware manufacturers. The need for instruments will be met by standalone GM modules and GM synthesis engines on chips on a computer card, and many of the major players are already in the ball game.

So the truth is, General MIDI means more instruments to be sold and more music to be composed. It won't harm the professional synthesizer market, but it could help support it. Whether you make chips or charts, if you want to reach a bigger audience, you should check out General MIDI.

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16-FOLD PROCESSING

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ROUTING:

All of the sixteen MT-16X inputs can be merged without limits and they can be distributed to any outputs. The programs can be recalled either via MIDI, remote or the foot switch. Every input has its own separate MIDI on/off function with an integrated ALL NOTES OFF generator.

PROCESSING:

SPLIT: 8 SPLIT zones per input.

TRANSPOSE: Up to +/- 64 halftones.

FILTER: Individual filtering of MIDI

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VELOCITY: switch/limit/offset.

DATA CONVERTER: Controller Converting.

MANIFOLD: Multiplies the MIDI transmit channels.

SEND FUNCTIONS: PROGRAM CHANGE, VOLUME, MIDI CLOCK SEND DATA, TR-Transparent MIDI reset.

OPTIONAL EXPANSIONS:

On request, the MT-16X can be optionally upgraded to a combination of a MIDI Matrix/Processor and a Sequencer Player. It uses the universal MIDI File Standard for its internal format. This assures full compatibility to top software sequencers. Its built in 3,5" floppy drive (720 KB/1.44 MB) is PC compatible and allows loading of songs from this computer system.

PLAYBACK:

Hundreds of songs can be loaded into, if expanded to full 16 MB. Once

loaded, any of them can be started instantly by the footswitch, MIDI program change or from the included remote control. Any of the 64 tracks can be assigned to any of the MT-16X outputs simultaneously.

RECORDING:

Recording of MIDI data is possible with high resolution simultaneously on all inputs. With UNIVERSAL DUMP any system exclusive data of different MIDI instruments can be safely stored and archived.

FURTHER OPTIONAL EXPANSIONS:

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Making the Multimedia Move

Part One:
Your computer's good
for more than just
audio editing

BY DAVID MILES HUBER

We've all heard that multimedia's the next big thing and that it's just as good, if not better than, hot-buttered rum. It seems, however, that few have taken the time to explain just how it can be put to everyday good use. In this two-part article, let's see if we can cut through some of the fog and get to the heart of how multimedia can work for you.

WHAT IS IT?

By now, most of us know that multi-

media is a computer-based environment for integrating text, graphics, MIDI, digital audio, and full- or limited-motion video. In a nutshell, multimedia is an environment that provides us with a set of integrated media tools that has direct applications for education, entertainment, and even our everyday working world.

Multimedia capabilities are presently available on all of the popular PC platforms, and campaigns are being mounted by a number of major companies to make multimedia players as indispensable to our home lives as the microwave. By simply popping in a CD-ROM, CD-I or CDTV disc, we can browse through multimedia encyclopedias, play games with the kids, or have near instant access to over 680 MB of CD-ROM data that can span a huge range of topics.

This new medium is not just for the info and game addict, however. The basic key to how and why multimedia can offer some serious bang-for-the-buck is knowing that the inte-

gration and handling of MIDI, digital audio, and video are programmed into the operating system's basic structure. This is a key difference between multimedia and the processing architecture of a digital audio or video workstation.

In a traditional workstation environment, much of the signal processing and routing is handled by additional coprocessing hardware and software that has been designed to perform specialized tasks. In a multimedia environment, the basic control and signal processing functions are often handled at the software level. Data to and from the software is then routed by the operating system through an installed driver directly to a dedicated hardware interface. In short, the processing "pressure" is often taken off the specially designed hardware and software and instead is handled using a direct software-to-interface path at the system level for far fewer bucks and with greater simplicity than would otherwise be possible.



COMPUTER VIDEO: Apple's QuickTime software enables digital video on either Macs or Windows computers.

BUT WHAT CAN IT DO FOR ME?

One of multimedia's best features is its flexibility. There are a number of practical ways in which the various media can be combined and directly applied to business, education, production, and play. For example, desktop video currently allows full-motion color movies to run in a 3- to 6-inch diagonal window on the computer's screen. Such an application can place graphic and visual media power directly into the hands of almost anybody.

A number of software packages are coming onto the scene that let you integrate video, graphics, digital audio, and MIDI into a SMPTE time-based sequencer format. Such a production environment could be used to get your message across in the form of a self-running movie. With the advent of standardized applications such as Apple's QuickTime for the Mac (soon to be released for Windows) and Microsoft's Video for Windows, video data can be stored and manipulated from hard disk in real time using com-

pression factors that range up to 20:1, without a visible loss in picture quality. They also allow otherwise incompatible desktop videos that differ in frame rate (there is no current standard) and pixel format to be seamlessly inserted into the sequence.

By adding a video interface card, such an application would allow wild or time-encoded video footage to be dumped directly onto hard or optical disc. Once it has been transferred, the scenes and audio tracks could be cataloged and assembled in a random access, SMPTE-based environment. This form of off-line video assembly could be done at a fraction of the rental cost of an off-line edit suite.

Another approach to multimedia production uses a "linked object" environment. This approach is more interactive than self-running media in that it places the choices of what is to be experienced into the hands of the user. An object can be an on-screen icon, text, or video graphic that when once clicked by the mouse, will trigger the related event into action.

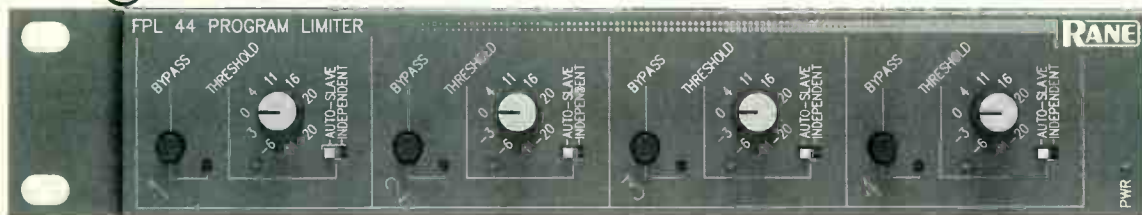
A third approach to multimedia comes through programs and applications that integrate media in cost-effective and creative ways. For example, I'm currently working on a number of environmental CDs where my main computer (running under Windows 3.1) handles the simultaneous task of MIDI sequencing and playing the basic digital audio tracks. A second computer, which is also loaded with a high-end multimedia card, is able to accurately trigger recorded digital tracks from the master sequence (using Digital Audio Lab's Catalog soundfile application). Basically, this gives me four synchronized digital audio tracks for the price of a song.

UPGRADING TO MULTIMEDIA

Beyond the basic requirements for processing speed and memory, probably the most fundamental question to ask yourself relates to the choice of interface hardware that would best fit your own personal needs.

Beyond adding a CD-ROM drive,

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the choices for adding media hardware are diverse. For example, certain computers (such as the Atari Falcon) are designed with MIDI and digital audio ports built directly into them. In such a case, all that's needed is to search out software that best fits your needs and you're in business.

Most computers, however, require that separate hardware components be installed into the system. For example, when using a Mac you might want to add a high-quality digital audio board and a separate outboard MIDI interface. For those of you who don't presently have a MIDI interface and only need 16 channels, I'd recommend looking at the Yamaha TG-100 (Mac & IBM) or Kawai G Mega (Mac). These sound modules combine a single-port MIDI interface and General MIDI sound generation capabilities into a single package.

As most IBM users are aware, scads of hardware sound cards have been designed to run under Microsoft's Windows 3.1. Most of these "all-in-one" cards include digital audio, a MIDI interface and some form of multitimbral FM or sample-based synthesis. Quality is an issue, however. Of course, cheaper cards that only offer sample rates up to 22.5 kHz will most likely sound cheesy, but even a number of the so-called "pro" cards that work at 44.1 can also sound really bad. Don't look at digital "specs" when purchasing such a card; I've generally found such specs to be useless. My simple advice is caveat emptor and let your ears be your guide. Also, none of these cards are MPU-401 compatible. If you're running MIDI programs that are strictly MPU-401 compatible, they probably won't work with these cards.

NEW OPPORTUNITIES

As the demand for new multimedia software and titles grows, so will the need for creative talent. Some of those already being affected by this new field are audio and video professionals, graphic artists, writers, and musicians. For example, multimedia production houses or corporations will need MIDI musicians who can supply General MIDI sequences for games, business presentations, and the like. Full-motion desktop video will also open up a number of new opportunities.

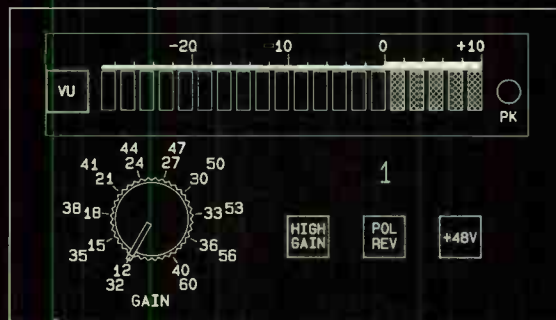
Interestingly (and conveniently), many CD-ROM developers have only a limited knowledge of what quality audio is all about. However, those of us who have spent years in project studios trying to squeeze the last ounce of performance out of budget gear are well-equipped to deal with the sometimes severe memory and quality constraints of a multimedia system. Multimedia developers need good musicians and audio engineers; with a bit of effort, you could be a part

of the multimedia future.

In part 2 of this article, we'll be taking a look at a number of software programs and basic tips that can help you make the most of your multimedia system. **EQ**

David Miles Huber is the author of Random Access Audio, which was recently released by Sams Publishing (Carmel, IN)

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Not surprisingly, this level of acceptance has inspired a number of "imitation CR-1604s." When comparing them to the original, remember that only the CR-1604 lets you add full-fader MIDI automation at any time. Hear the OTTO-1604 and CR-1604 at your Mackie Dealer today.

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The OTTO-1604 MIDI module consists of an **INTERNAL GAIN CELL BOARD** which allows you to adjust the CR-1604's internal gain for the multi-track mixer's external outputs. **MIDI CONNECTION BOX** connects to your MIDI controller.

FADER UPDATE MODE allows you to enter a list of parameters to be controlled by the OTTO-1604.

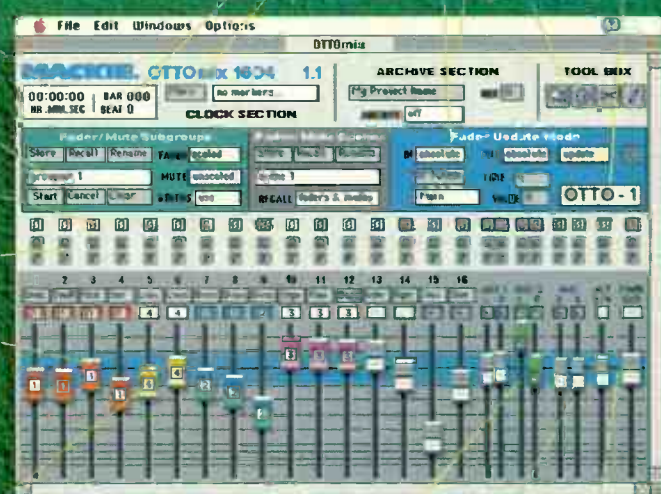
ARCHIVE SECTION allows you to store the current settings of the OTTO-1604. **OTTO ASSIGN** allows you to assign the OTTO-1604 to a specific MIDI controller.

TIME CODE INDICATOR

SUB-GROUPS

FADER & MUTE

FADERS



AUX 1, 2, 3 & 4 LEVELS **ALT 3/4 LEVEL** **MAIN L/R OUT LEVEL**



OTTO-1604 can be upgraded with ANY MIDI sequencer that offers a real-time MIDI controller. If you have a MIDI controller, you can use it to control the OTTO-1604. If you don't have a MIDI controller, you can use the OTTO-1604's internal MIDI controller. The OTTO-1604 is a compact, powerful MIDI controller that can be used to control any MIDI device. It has a keyboard and a display screen, and it can be used to control any MIDI device. It is a compact, powerful MIDI controller that can be used to control any MIDI device. It has a keyboard and a display screen, and it can be used to control any MIDI device.



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SESSION

continued from page 65

digital tape? Since the costs are comparable, the question is priorities. If precision editing is important, either as a way to fix mistakes or as a creative tool, Session 8 shines. The power of digital audio can be extremely intoxicating when you create incredible solos, bounce single voices into gigantic choirs, and shift chorus and verse around with a few mouse movements.

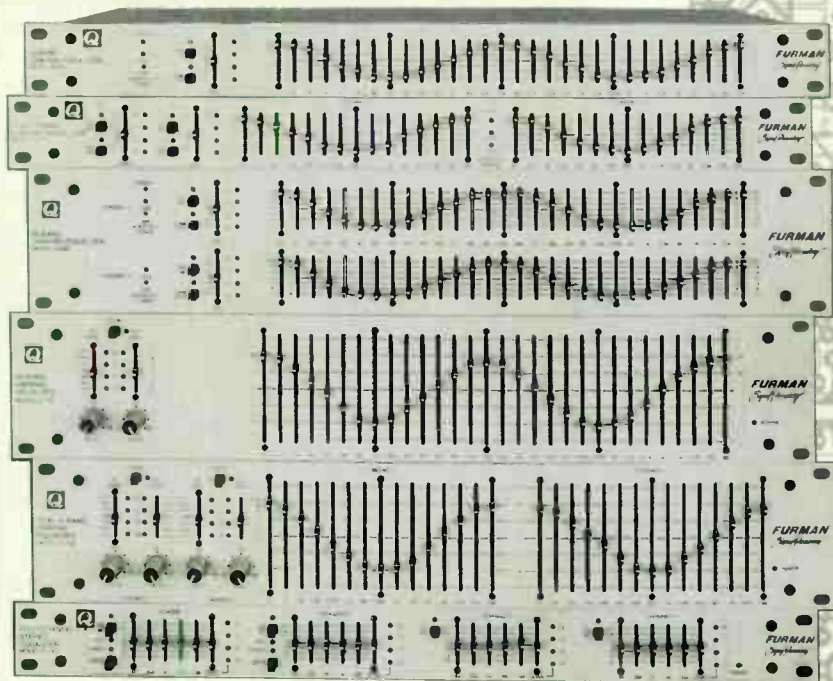
For hard disk recording virgins, Session 8 is a breeze to learn. It has a brilliantly effective interface, works just like equipment we know and love, and uses color intelligently; I got up and running on it within minutes. The bad news is the PC end of things. You need to understand Windows, DOS, peripherals, defragmentation, backup and archiving, SCSI, etc; if all you want to do is make music you might be happier with tape. Then again, if you've always wanted to get into computers, sequencing, and digital recording there's no time like the present, and Session 8 makes the learning curve fairly painless.

Another consideration is compatibility. Something like ADAT or the DA-88 is instantly compatible with other users; this could happen with Session 8 if all users practiced a specific backup protocol, but they don't. However, there is a "lowest common denominator" way to back up to DAT, so Session 8 owners with DAT's can exchange data.

I was disappointed that there wasn't more DSP (compression, normalization, gating, etc.) since this is such a strong point of Digidesign's Sound Tools and Pro Tools systems. But the company has a history of updating products, and they plan to enhance Session 8 in the months ahead with some additional DSP functions, a program to transfer tracks between ADAT and Session 8, ADAT control from within the Session 8, additional DSP effects, and file translation software to transfer files between PC-based and Mac-based Session 8 setups. Updatability is always welcome, and it's encouraging that Digidesign is already looking ahead to the next software revision.

Overall, Session 8 has brought down the price of hard disk recording and wrapped the whole process in an easy-to-use package. If you've been lusting after the power of a multitrack hard disk system and ease of use is your main priority, Session 8 makes a compelling argument that now is the time to satisfy those lusts. **EQ**

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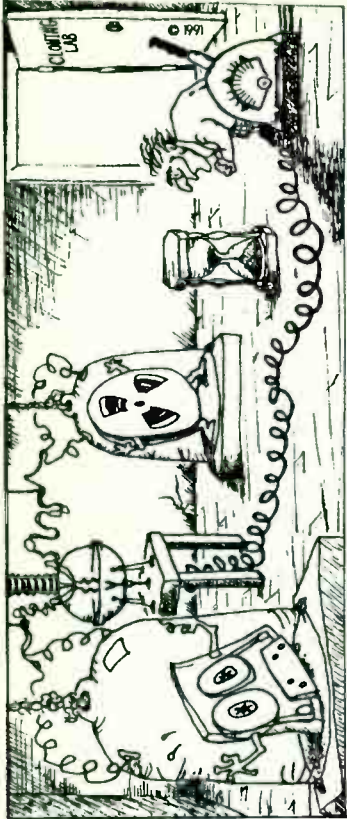
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FENDER

continued from page 88

labeled SIGNAL, flickering along with the audio signal to serve as a simple level indicator. On the SPL-9000, however, when the signal indicator is green everything is OK and when the LED goes out it means that the amp is in a muting mode (during turn-on or fault protection) and audio will not be passed to the loudspeakers. I would prefer a two-color or flashing LED that can be seen from a distance, as the lack of indication during protection mode is not as obvious as a change in indication.

The rear panel includes a number of useful features, such as actively balanced XLR inputs with parallel phone jacks, and XLR outputs for feeding multiple amps from one crossover. There are convenient push-button switches for selecting stereo or summed-mono input mode, bridged-mono operation, and lifting the ground connection between the audio signal and the AC power. The bridged-mono mode switch is recessed to prevent accidental operation while the amp is on — a valuable protective design feature.

Output connection is made using either 5-way binding posts or 1/4-inch phone jacks. I personally dislike the use of a phone jack for connecting the output of any power amp, especially those over 100 watts. Not only is the phone connector not designed for

that current capacity, it also can short circuit the amp output when being connected, expose the user to potentially hazardous voltages, and allow outputs to be plugged into inputs. As a caution to the uninitiated, the preliminary manual does warn against using guitar cords to connect the amp to loudspeakers (the cords can melt).

The delayed-on and instant-off muting circuit does mute the amp for about one second during the initial power-up, but if the amp is turned off, it takes about 10 seconds to mute. If the power is only momentarily interrupted, however, the amp doesn't mute at all. I would prefer the muting to be instantaneous when power to the amp is lost for even a second or two.

Computer monitoring and control is planned for the future of this amplifier series and although this seems somewhat esoteric now, in a few years it may seem like a necessity. The applications for integrating your system under a central control interface are numerous and may eventually be suited to even the small club system that is operated onstage by a band member. A keyboard LCD display could include the entire sound system control interface, as well.

Fender has certainly produced an amplifier well-suited to sound-reinforcement applications, with the most important features that this application requires. The Fender-Sunn SPL-9000's list price of just \$930 takes me back many years to the days when good amps cost about \$1 per watt. **EQ**

EDITOR'S CHOICE

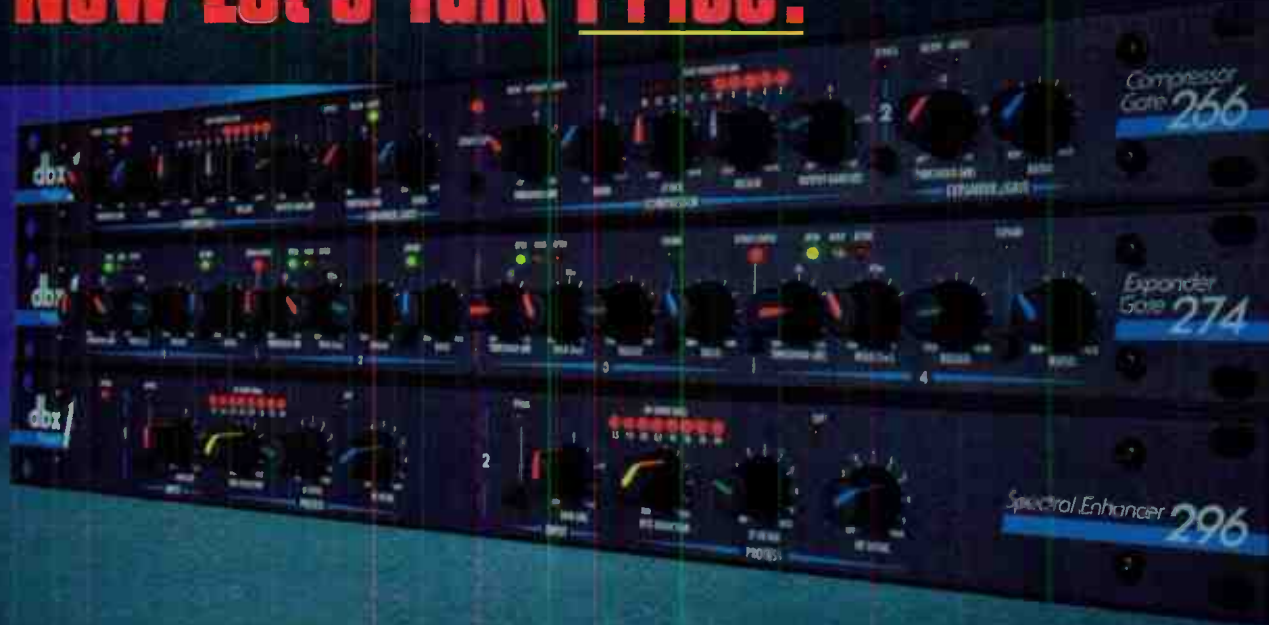
EVERY BIT COUNTS

Akai has introduced the new and affordable S01 Digital Sampler. It has been designed for easy operation and highlights the latest 16-bit linear sampling technology, yet it does not require the complicated operations often associated with samplers of high sophistication. Features include multi-sampling and multi-timbral capabilities. You can sample for up to 15.6 seconds of sounds (extendable up to 31.25 seconds) in eight banks. The unit features 8-way split (maximum) sampling, real-time play, and a looping function. You can set the release response and you can also use a velocity-sensitive keyboard. You can combine channels with MIDI channels for multi-timbral and multi-sampling capabilities. The S01 comes with libraries of sampled data taken from the S1000 and S1100 stereo digital samplers for a wide range of music types and instruments. The optional ME3T Audio MIDI trigger



allows drummers to play the S01 from a conventional kit or pads. For the complete story, contact Akai, P.O. Box 2344, Fort Worth, TX 76113. Tel: 817-336-5114. Circle EQ free lit. #119.

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Is There An MD In The House?



Photo by Peter Monroe

You've heard the hype
— here's the technical
truth about Sony's
miniature digital format

BY LEN FELDMAN

Last time I told you about low bit-rate coding as it applied to the Philips-developed Digital Compact Cassette, or DCC. This time I want to talk about the other format that uses a form of low bit-rate coding — the MiniDisc, developed by the Sony Corporation.

There are actually two types of MiniDiscs, both of which can be played in any MiniDisc player — pre-recorded and recordable. Both types measure only 2-1/2 inches in diameter, but thanks to data reduction, each can contain as much as 74 minutes of music.

Pre-recorded MiniDiscs are very much like CDs in their construction. That is, they have microscopic pits or depressions in their polycarbonate surface. A laser pickup notes changes in reflectivity of its light beam between the disc surface and the

depressed pits. These differences correspond to the digital "0's" and "1's" that make up the digital musical bit stream.

The recordable version of the MiniDisc works on a completely different principle. Among the layers that go to make up the recordable MiniDisc is a layer consisting of a magnetic element known as terbium ferrite cobalt. It is the discovery of this material's low "Curie temperature" (around 400 degrees C) that makes it possible to both erase its previous magnetic pattern while at the same time laying down a new pattern of magnetic "north" and "south" polarities that, in this case, constitute the digital "0's" and "1's". More about how this is done in a few moments. First, let's examine other physical differences between CDs and MDs.

One of the most important differences is the elimination of that infernal "jewel box" that normally houses CDs. MiniDiscs (both the pre-recorded kind and the recordable type) are housed in their own protective "caddies" so that the whole package resembles a 3-inch computer floppy disk except that it's smaller. A slider normally covers access to the disc itself. It is opened to expose the disc's surface only when the disc is inserted in a player or a recorder/player.

THE ATRAC ENCODING SYSTEM

I told you up front that MiniDiscs use a data reduction system based upon the same two psychoacoustic phenomena used to reduce data in DCC equipment. In the case of the MiniDisc, the system of data reduction has been given the acronym ATRAC. It stands for Adaptive TRANSform Acoustic Coding. For those of you who failed to read my last column (for shame!), the two psychoacoustic principles I talked about then, and that are also used in the ATRAC coding system, are the elimination of data that is masked by other, louder musical data that's near it in frequency and the elimination of data that's below the threshold of human hearing. In other words, if you can't hear it, the MiniDisc ATRAC system doesn't record it.

Aside from the fact that ATRAC can eliminate about 80% of the data that would be needed if you were to make a 16-bit linear CD (as opposed to about 75% for the PASC encode system used by the DCC system), there are other differences between the two bit-rate reduction systems, but we don't have to get into those differences to appreciate the MiniDisc technology.

OPTO-MAGNETIC RECORDING

A MiniDisc recorder actually houses two "heads" — one on each side of the disc. One of these is a laser head that performs a dual function, as we'll see shortly. The other head, mounted on the opposite side of the disc, is a magnetic head. Here's what happens when you make a recording: The laser head heats the temperature of the magnetic layer of the recordable disc to the Curie temperature I mentioned earlier. At that temperature, any existing magnetic pattern of "norths" and "souths" is erased or neutralized. As the magnetic layer begins to cool, the other magnetic head lays down a new pattern of magnetic "norths" and "souths" corresponding to the new ATRAC audio data being recorded. Sony claims that you can erase and rerecord an opto-magnetic MiniDisc more than one million times without any degradation. (I can just visualize some young technician in a Tokyo lab checking this out, day after day, until one million erasures and rerecordings have taken place...)

The same laser that does the erasing during the opto-magnetic recording process is used for playback, either in the usual way by reading pits on pre-recorded MiniDiscs or by observing and interpreting changes in light polarity caused by the alternating magnetic "norths" and "souths" on the recordable MiniDisc. That's what I meant when I referred to the laser pickup assembly as a "dual function" unit.

TEXT PROVISIONS FOR MINIDISCS

Software suppliers of pre-recorded MiniDiscs can add text to the coded pattern. Text might consist of the

name of the selection playing, the artist's name, and so on. As many as 1700 text characters can be encoded along with the audio over the full 74 minutes of a MiniDisc. Of course, the amount and content of the text will depend upon the software supplier. Perhaps even more astounding is the fact that you can also add text to those opto-magnetic recordable discs, including the date and time the recording was made, the title, and of course track numbers.

Speaking of tracks and track numbering, here's another interesting thing about MiniDiscs that distinguishes them from any tape recording format. Suppose you record five selections on a MiniDisc for a total of 40 minutes of recording. You play the disc back and you decide that you don't really like Track 1, which, by the way, was eight minutes long. So, you begin to "over-record" on Track 1 with a new selection. But this new selection runs to ten minutes. Will the recorder erase two minutes of Track 2? Not on your life. This machine has "smarts." When it senses that it's about to run into a recorded section of the disc, it hunts for some unused (unrecorded) portion of the disc and puts the last two minutes of the new Track 1 there.

In this respect, it works just like a computer floppy disk. When you save a file to a "floppy" on a computer, if there's not enough contiguous space on the floppy, the computer breaks it up into as many chunks as possible and lays them wherever it finds open space for them.

The "miracle" in the case of the MiniDisc is that during playback, even though the data for the selection may be spread over various sections of the disc, you will hear no musical interruptions or "glitches" as the laser pickup moves around to find the remainder of the song. More in a moment about how that's done.

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The "miracle" in the MiniDisc is that during playback you will hear no glitches as the laser pickup moves around.

SHOCK RESISTANT TECHNOLOGY

One of the problems with CDs in a car or portable CD player is the tendency of its laser pickup to mistrack if the unit is jarred or, in the case of car CD players, if you go over a deep pothole while driving. In introducing the MiniDisc, Sony has positioned the format as one particularly suited to portable use and to a mobile lifestyle.

As if to emphasize this application, Sony has come up with a clever technology that all but prevents mistracking even when the player is jarred or bounced around. Data is read from a MiniDisc at the high rate of 1.4 megabits per second. The ATRAC decoder, however, requires a data rate

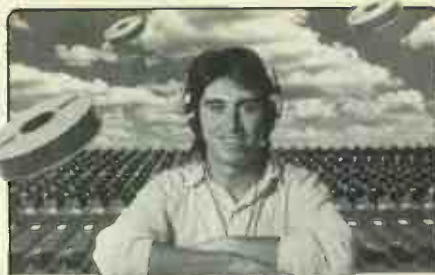
of only 0.3 megabits per second. So, between the laser pickup and the ATRAC decoder, the MiniDisc player incorporates a memory chip that can hold up to 4 megabits of data. That's about ten seconds worth! If the laser pickup mistracks, data flows from this memory until the laser pickup "finds its place" again. It's

this buffer memory that accounts for the ability of the system to do the non-sequential recording I described earlier.

IS A FORMAT WAR INEVITABLE?

There's been much talk about a format war between DCC and MiniDisc. Truth to tell, Philips, the inventors of the DCC tape format, have cross-licensed their technology with Sony and Sony has done the same thing with Philips regarding MiniDisc. Only the marketplace can decide whether one, both, or neither format becomes the '90s replacement for the long-lived analog cassette.

One encouraging note: Unlike DAT, which came to market with virtually no software support, both DCC and MD were launched along with literally hundreds of albums in each format. Don't expect one format to dominate in a few weeks or months. It's likely to take longer than that. Meanwhile do as the software companies do: hedge your bets!



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As the Digital World Turns

The audio soap opera depicting the battle between MiniDisc and DCC continues, and continues...

BY MARTIN POLON



How many ways do we count the "blessings" or, if you prefer, the irreversible changes that the digital compact cassette (DCC) and the MiniDisc (MD) will bring to the record and recording industry merely by being in existence? Is it the inevitability of one format or the other surviving to "threaten" the compact disc (CD)? Is it the fact that low-bit-rate encoding and digital signal companding supposedly corresponding to the psychoacoustic realities of the human ear and brain have entered both the lexicon and the tool kit of the audio professional for good? Is it the potential for negative impact on the music consumer as the battle for the marketplace ensues between MD and DCC in 1993 and beyond? Or is it the potential "dilution" effect on the current retail distribution marketplace for recorded music? Or last of all, might it be the changes wrought on the after-session monitoring practices of the recording industry?

Why not just settle for all of the above? And while we are at it, we must also acknowledge that it would be wonderful if the two new formats could bring their digital magic to the audio marketplace without any downside issues and restore momentum to our sluggish recorded music industry.

First, we have to acknowledge that from this point forward, the process of recording and reproducing digital audio in its fullest dimension — that is, with complete unaltered digital signal information — will be increasingly challenged by those who believe that the process of reducing the amount of space needed to record can be accomplished with no real loss of fidelity. We are already seeing the use of digital audio tape (DAT) recorders being criticized as a medium for ASM (after session monitoring).

The next argument made is that what musicians really want is a transportable format compatible with home and car. Since the DCC and especially the MD seem to appeal to the automotive-minded artists and their producers, we can look forward to seeing the decisions about which tracks stay and which have to be redone being made in an Accura Legend traveling between the studio and the front door of "Le Restaurant." The current practice of supplying living room dubs on DAT for après-session second guessing over several bottles of Killian's Red is bad enough, but the digital duo of DCC and MD promises new levels of portable postmortems.

Then consider the plight of the record retailers who, in the average mall stores that do 80 percent of all recorded-music business in the U.S., must dilute their CD and analog cassette inventory by approximately half to carry even a rudimentary stock of DCC and MD recorded music! The average mall store carries 4000 compact discs in inventory. If space is made for DCC and MD of, say, 300 titles in a depth of three units, that is 900 pieces for each new system. Times two, that is nearly 2000 pieces or about half of existing stock. Reducing the depth of music inventory in each format, needless to say, is not the way

to draw customers, who look for diversity rather than for a large number of the same titles in a multitude of formats. As you might imagine, retailers are not enthusiastic about either reducing inventory of existing formats or building extensions onto their stores!

The reality now imposed on the DAT format is that no matter how well it has been received at the personal, project, and mainstream studio levels, it was virtually moribund at the consumer level before DCC and MD and is certainly on its way to be DOA (dead on arrival) in that home venue by this time next year! That certain loss of consumer impetus could doom DAT even in the studio world. DAT began as a consumer format and the R&D was funded by the promise of consumer applications. The DAT system cannot evolve further without a larger base than the professional market offers. And the large Japanese audio/video makers who currently drive the DAT marketplace have not been posting positive balance sheets in these markets and are unlikely to sustain DAT unless it remains profitable.

As to the ultimate winner in the home audio derby, it may be premature to count out the dark horse candidate, Dolby S. This consumer version of the professional SR system has been mated to high-quality analog cassette decks and has shown exceptional performance. Consider the fact that in professional studios, approximately 50 percent of all albums recorded are processed with Dolby SR as opposed to digital multitrack systems. This is done as much owing to artist insistence as to any other technical factor. If that kind of consumer acknowledgment of an affordable analog alternative should take place — coupled with the high cost (over \$10) of blank and prerecorded DCCs and MDs — then analog could still have a run for its money!

As to which system is superior, stay tuned to these pages for further looks into the audio future. One thing is sure, this digital horserace will never be boring! **EQ**

DAT MACHINES

continued from page 51

enough for most users. But problems can arise when setting up a duplication system. If you use all the same model of recorder, every time you push Record on a wireless remote, all machines will go into record. That's fine for the duplication decks, but not for the source machine! One option is to use only hard-wired remotes, but then you have to keep one in front of you for each machine, and it can be really hard to start three or four decks at once. Panasonic offers a solution with the SV-3900 and its accompanying remote, the SH-MK390. The SV-3900 responds to ES-bus serial control of all transport modes and functions, and a single remote can control up to 32 SV-3900 DATs. Convenient functions for dubbing are built in, and the remote may even be programmed to automatically assemble cuts in any order from one or more source decks on a single master deck, complete with 10 seconds of silence between cuts. The SV-3900 may also be computer controlled.

A final area to take a look at is the



TASCAM's DA-60 DAT offers timecode abilities at an affordable price.

quality of analog-to-digital and digital-to-analog conversion (ADCs and DACs). All machines are not created equal, and it can be startling to hear the same tape played back on several different machines. Despite the uniformity of the digital format, the sound still needs to be converted from digital data to analog waveforms before it can be listened to, and analog waveforms to bits and bytes before it can be recorded. The character and quality of each machine depends both upon the grade of DACs and ADCs, and the finesse and components with which the analog electronics have been built. One of the ways to make a machine less expensive is to use cheaper components, so it's not as though you're getting something for nothing

when you acquire a lower-cost machine. If at all possible, audition machines in an environment where you can compare their sound, and don't take as gospel a salesperson's word about which machine sounds best; as in most situations having anything to do with sound, it's largely a matter of personal taste.

No matter which DAT you end up with, you'll land squarely in the world of digital mastering. Even though the format isn't perfect, for most users it's a giant leap forward from the noisy and distorted analog universe. **EQ**

J.D. Sharp is available for questions and answers on America On Line, as "BananaDan."

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NEW (AND RECENT) DAT DEBUTS

Several new DAT machines have made their appearance recently, opening up the options for project recordists:

- In the portable arena, JVC's new XD-P1 Pro combines diminutive size with a full retinue of professionally oriented features. These include the complete absence of SCMS; analog and digital recording at 32, 44.1, or 48 kHz sample rates; optional extra-long-life battery; three-hour playback time with standard batteries (2.5 hours of recording); absolute time; and a digital-output microphone that switches between M/S stereo and shotgun mono patterns (the ADC is built in). High-quality recording is assured by one-bit, 64x oversampling ADCs and dual 18-bit DACs. Aluminum and magnesium components and frame deliver durability with low weight (22.6 ounces with battery and microphone attached.)

- Panasonic's SV-3200 falls on the low side of the \$1000 price barrier. It is an ideal machine as a second DAT in a studio, or for those users who find they can live with the limitations imposed by SCMS. It offers 44.1 and 48 kHz recording via the analog inputs, and all three sample rates in digital mode. One-bit, 64x oversampling ADCs and four one-bit DACs offer high audio quality. Panasonic's ubiquitous shuttle wheel is featured, which is particularly nice for shuttling around your tapes at low and medium speed.

- Sony will soon introduce a similarly configured "somewhat-professional" DAT in the same price range. Named the DTC-A7, this DAT machine offers 1-bit A/D conversion and advanced HDLC D/A converters. When it is in its long-play mode, the recording time is doubled by using a 32 Hz sampling frequency. Like Panasonic's model, the DTC-A7 also features recording at either 44.1 kHz or 48 kHz and is priced at under \$1000.

- The other interesting newcomer to the DAT world is Tascam's DA-60. It brings timecode and (optional plug-in) synchronization ability down to a more affordable price range. The sync option includes Sony 9-pin compatibility, making the DA-60 adaptable to a wide range of video editing systems with no fuss. It's also distinguished by providing four heads for monitoring while recording, a characteristic shared only with higher-end Sony DATs. Broadcasters will benefit from the two-second RAM buffer, which allows instantaneous starts. Auto Cue starts play at the first frame of the selected program's audio. The inclusion of both XLR and RCA audio jacks is easy to appreciate, and the XLR digital I/O switches between AES and SP/DIF format for compatibility with all systems.

- Fostex America has introduced the D-10 DAT Master Recorder, which features both Auto Cue and Instant Start features. The unit is simpler to operate and more precise than most other recorders as a result of several features specifically designed for the audio editor. Its Instant Start feature and onboard RAM saves the editor time when dropping in effects by eliminating pre-roll and loose cues. The unit sells for about \$2,850.



IN REVIEW

Sony DPS-F7 and DPS-R7



MANUFACTURER: Sony Corporation of America, 3 Paragon Drive, Montvale, NJ 07645. Tel: 201-358-4197

APPLICATIONS: Digital effects: Dynamics, EQ, Pitch Transposition, Reverb, and Delay.

SUMMARY: The latest generation of digital signal processing IC's, plus software adds incredible versatility with improved noise specs.

STRENGTHS: Easy to use. Algorithms for every application. Options include clean or soft clip modes, bass and treble enhancers, usable equalizers and dynamics processors.

WEAKNESSES: A more elaborate remote would increase operator speed.

PRICE: DPS-R7 — \$1335; DPS-F7 — \$1650 **EQ FREE LIT. #:** 120

SONY IS A NAME synonymous with digital multitracks, DAT, and the compact disc. It is less common, however, to find the Sony name among digital signal processors in a control room rack. That may soon change with recent additions to the Sony family.

The newest entry is the F7 Dynamic Filter Plus (\$1650) with dynamics (limiters, compressor/expander and gate), parametric EQ, dynamic filter, percussion and mono synths, vocoder, and subharmonic generator.

The hardware platform for all four models centers on Sony's custom digital signal processing (DSP) IC, the CXD2704, which features 32-bit internal architecture. DSP involves number crunching in a big way. For the outside world, the 16-bit format is our reality, but inside, the extra bits increase processing speed and improve accuracy. Sonic integrity is further aided by an 18-bit oversampling Delta-Sigma A/D converter, and a 49 MHz advanced pulse D/A con-

verter interfaces the unit to the outside world. The sampling rate is 48 kHz for three of the models; the R7 has a 40 kHz rate. (Reverb algorithms require lots of math. The reduced sample rate makes for less homework.)

WHAT'S THE DIFFERENCE?

Of the three analog controls on the left side of the physically similar units, only two hint that there are differences between models. While a concentric dual-input level control is common, the other two controls vary depending on the unit and the needs of the software.

All models deliver 100 factory presets and 256 user presets, prefixed "P" and "U," respectively. You will find an incredible assortment of options from which to create your own library of sounds.

The foundation for any of the effects is an algorithm — a computer program written in the language the DSP understands. Each effect is made

up of a number of algorithms that are organized into groups called "blocks." Once digitized, the signal follows a path that includes several blocks in succession. A typical arrangement might be:

Input—>Pre-Effect—>Reverb—>Post-Effect—>Output

A myriad of adjustments is possible within each block. Once the Edit button is pressed, the cursor can be positioned to the input block, where, for example, input level and pan can be adjusted. Parameters such as decay time and room size are found in the reverb block.

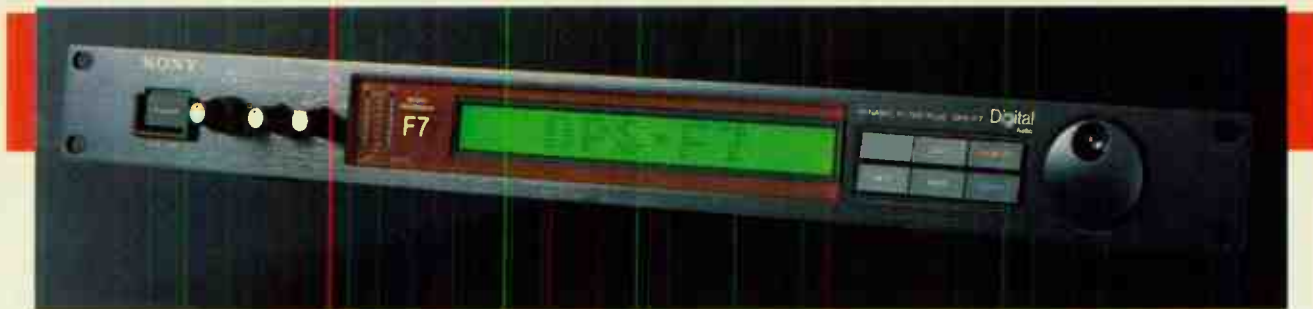
There are system blocks that affect features such as "dial sensitivity" and "baud rate" (communications speed of the remote). A back-up battery maintains the user presets and the internal clock. The output voltage level can be monitored in the system block. There's even room for your name and birthday!

The manual has great block diagrams, which do more to explain operations than does the poorly written text. The manual lists all the parameters and options for each algorithm. This is very helpful and easier than scrolling from either the front panel or the remote. An additional pamphlet is a handy reference for presets and algorithm info.

The DPS series is fairly easy to operate without the manual. (My very first test was sans manual, to determine the user friendliness of hardware and software.) "Saving" does require referring to the manual and is well documented via graphic blocks. One term, "Sync," is used to denote that the adjustment of two channels



SONY'S DPS-R7 Reverb



can be linked. While separate adjustment of left and right channels is available, "Sync" speeds the process.

The optional remote basically duplicates the front panel. One addition, the Channel Select switch, determines which DPS unit is accessed (there are 15, in all). I got pretty fast at editing presets and creating names via "The Dial." It would have been nice to have a few assignable sliders or a keypad, but even without, the remote is convenient because it can be placed where you need it.

THE DPS-R7 REVERB

I haven't yet seen the R7 in my maintenance travels, even though it's been around for almost two years. It's worth special mention here. The presets can keep you busy for weeks. Specific effects are dedicated to percussion, guitar, piano, strings, organ, voice, ethnic music, and space travel. There are surfaces of wood and stone; environments called "Narration Booth" and "Nemo's Submarine"; plus a dozen "halls," including the Colosseum and the Grand Canyon. Phasers, flangers, exciters, reversers, and autopanners add to the arsenal. Some producers shouldn't hear the R7, otherwise you'll never get to go home!

There are about nine presets dedicated to drums, ranging from cavernous to gated. The medium to medium-short decays are lacking. (I feel as though I'm ordering a steak!) The R7 proved its algorithms were up to the task, though, when the reverb times were shortened. Most did so without sounding like a chainsaw or the inside of a basketball. I am especially fond of the plate and foil reverb algorithm. The Sony R7 offers a very good selection of quality effects.

THE DPS-F7 DIGITAL DYNAMIC FILTER PLUS

The DPS-F7 really means "Plus"! It features compressor, expander, gate, and equalizer algorithms. There is also a tape saturation simulator, an exciter, and a dynamic filter. Six presets recreate wah-wah, auto-wah, and percussive wah effects. some with

MIDI control. A subharmonic algorithm adds an extra bass octave. There are four vocoder presets (not amazing), plus both monophonic (a la Moog!) and percussion synths with built-in effects.

The dynamics algorithms (compressor/expander, etc.) were very versatile. All feature a sidechain equalizer that can, for example, turn a limiter into a de-esser. The only shortcoming is the lack of a sidechain monitor, which prevents the ability to hear the equalizer in the sidechain. The dynamic filter is a frequency-variable, low-pass equalizer (a.k.a. a high filter) that is program sensitive. That is, it can roll off high-frequency noise when no signal is present. Hence the expression, "single-ended noise reduction."

Probably the toughest demands would be made of the equalizer. Not only must it sound good, it must also be quiet. The signal-to-noise lab test was disappointing (see below); however, the unit had no apparent sonic shortcomings when used with my Rock and R&B program material. The F7 EQ was a welcome musical relief from the EQs found in most mid-priced consoles. (Those quasi-parametric, fixed-bandwidth types are more suitable for drums than for vocals or instruments. Plus the pots always get scratchy — definitely not a digital phenomenon!)

The equalizer in the F7 features variable frequency, shelving bass, and treble. In between are four parametric bands, each sweeping the full spectrum with adjustable bandwidth. The term "q" is used to describe the "coverage area" or "bandwidth" of a peaking-type equalizer. Buried deep in the system block are two options for how q is displayed. The default uses numbers ranging from 17.31 to .267, which is meaningless compared to the option of describing bandwidth in musical terms, such as 1/12 to 4 octaves.

My acid test involved the use of the expander and its equalizer. I pulled a demo tape by a Philadelphia band called Cats. When first mixed,

one song called for a bright, compressed, loud mix. I chose an avant-garde approach at that time, mixing through a dbx noise reduction encoder with its 2:1 compressor and upper-mid emphasis EQ. This helped create a mix that was very exciting, albeit a bit thin and noisy on the fade. (Using the decoder would have restored the dynamic range and flattened the EQ, taking the excitement with it.)

The F7's first task was to restore the fade with the expander. Here I set Attack Time to 0 ms, Release Time to 500 ms, and Expansion Ratio to 1:2. To restore punch, low frequencies below 250 Hz were boosted 12 dB. Threshold was the only parameter left to be tweaked. Once set, the F7 didn't seem to have any trouble restoring both the fade and the bottom end while maintaining the excitement. That tune had never sounded better!

While signal-to-noise was specified at 97 dB for the F7, lab tests resulted in a noise figure of 85 dB, unweighted. (I chose an EQ algorithm set to flat.) This is still quite good for effects boxes, which are typically quite noisy. The noise levels of the R7 and F7 were quite acceptable even though the F7 didn't meet spec. I would, however, require that spec if the F7 found its way into a mastering application and the F7 does have that potential.

CHECK IT OUT

I can think of a few good reasons to check out the DPS series. The sound is CD quality. The R7's reverb algorithms are quite good. The F7 EQ can be an effective, affordable mastering equalizer — especially through MIDI control. No analog dynamics processor has so many sidechain options built in. In fact, a digital console with all of these features would be even better. (Hint, hint!)

Finally, the DPS series combines the best features of multieffect processors while realizing the additional flexibility and control that four dedicated boxes have to offer, which is inspiring to musicians, producers, sound designers, and engineers.

—Eddie Ciletti

Passport Producer



MANUFACTURER: Passport Designs, 100 Stone Pine Road, Half Moon Bay, CA 94019. Tel: 415-726-0280

APPLICATION: Multimedia integration program

SUMMARY: Integrates MIDI and digital audio files for various applications.

STRENGTHS: Provides an elegant means for synchronizing MIDI and digital audio files with text, graphics, animation, and QuickTime movies.

WEAKNESSES: Requires a really powerful Mac for full functionality; onboard MIDI and digital audio editors are somewhat limited; no click track provided.

PRICE: \$495

EQ FREE LIT. #: 121

MULTIMEDIA TODAY may be more hype than substance (as one product manager recently observed, "Multimedia is still a concept in search of a market"), but there's also no denying that it probably represents the future of communications. In its most general sense, the word "multimedia" has come to mean any kind of computer-generated presentation that integrates visuals and audio. If this conjures up images of corporate boardroom presentations that combine endless sales charts with tweazy canned Muzak,

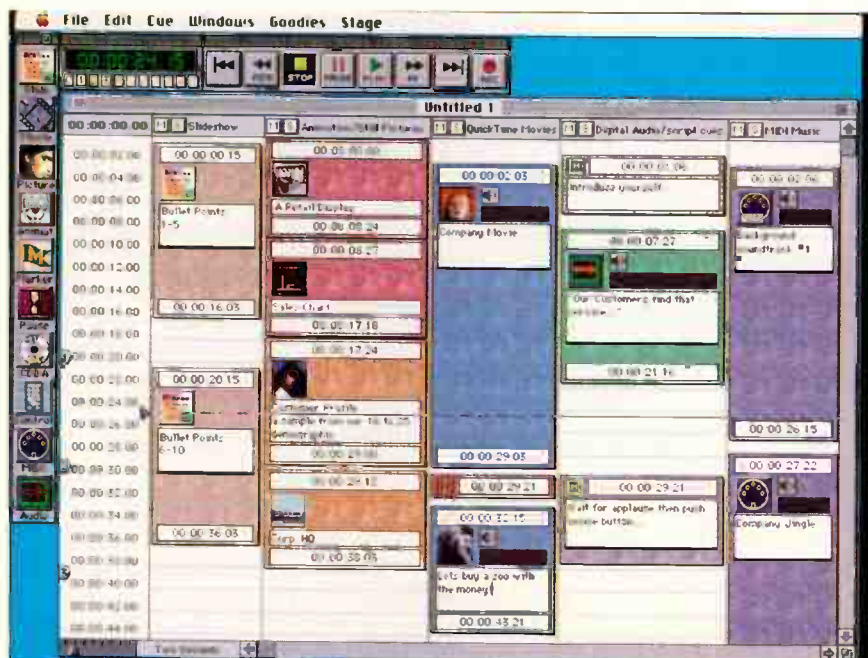
well, you're pretty much right — at the moment, anyway. But the future of multimedia — interactive entertainment, full-motion on-screen movies, high definition television (HDTV), and video teleconferencing — is an exciting one.

Since most *EQ* readers are, like me, mostly involved in music production, the question for us is: How can we incorporate the music we are creating into this burgeoning multimedia field? The fact of the matter (which may be surprising to some) is that it's

actually much easier to integrate audio into a multimedia presentation if you're using a Windows system than if you're using a Macintosh — even though the Mac is more popular among musicians. That's because Windows provides direct system support for the playback of standard MIDI files as well as 8- and 16-bit digital audio files (although both require external hardware). The current Mac operating system (7.1) still supports only 8-bit digital audio (though these files can be played back with the Mac's own hardware), and there are no MIDI file playback options. Sure, you can play and record 16-bit digital audio or MIDI files from within your favorite digital audio editor or MIDI sequencing application, but, because the Mac operating system does not support these formats, you can't access those kinds of files from within other types of applications such as QuickTime movie editors or animation programs.

Apple tends to guard its future product plans with Pentagon-like security, but rumors have been leaking out that a soon-to-be-released system upgrade will provide both 16-bit digital audio and MIDI file support. Until that time, however, if you want to synchronize a MIDI file or CD-quality audio with a QuickTime movie or other graphics file, you've only got limited options. By far the best of these options is provided by a new program called Passport Producer.

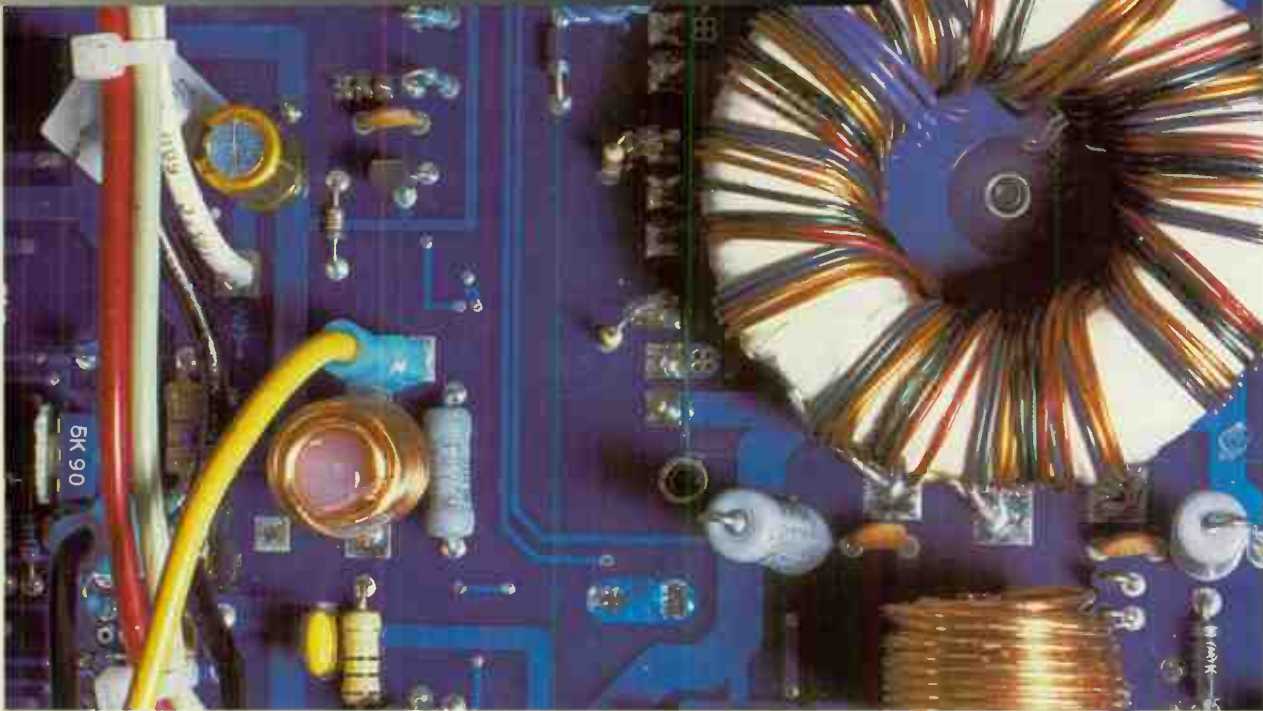
Like a MIDI sequencer, Passport Producer provides tape-recorder-like on-screen transport controls and an unlimited number of tracks into which data can be placed. Unlike a MIDI sequencer, however, you are not limited to just working with MIDI data. Using an on-screen palette, you can drag just about any type of multimedia file imaginable — MIDI, digital audio (8- or 16-bit AIFF or Sound Designer II format), QuickTime movie, PICT graphic, PICS animation, slide show, or even text files — into



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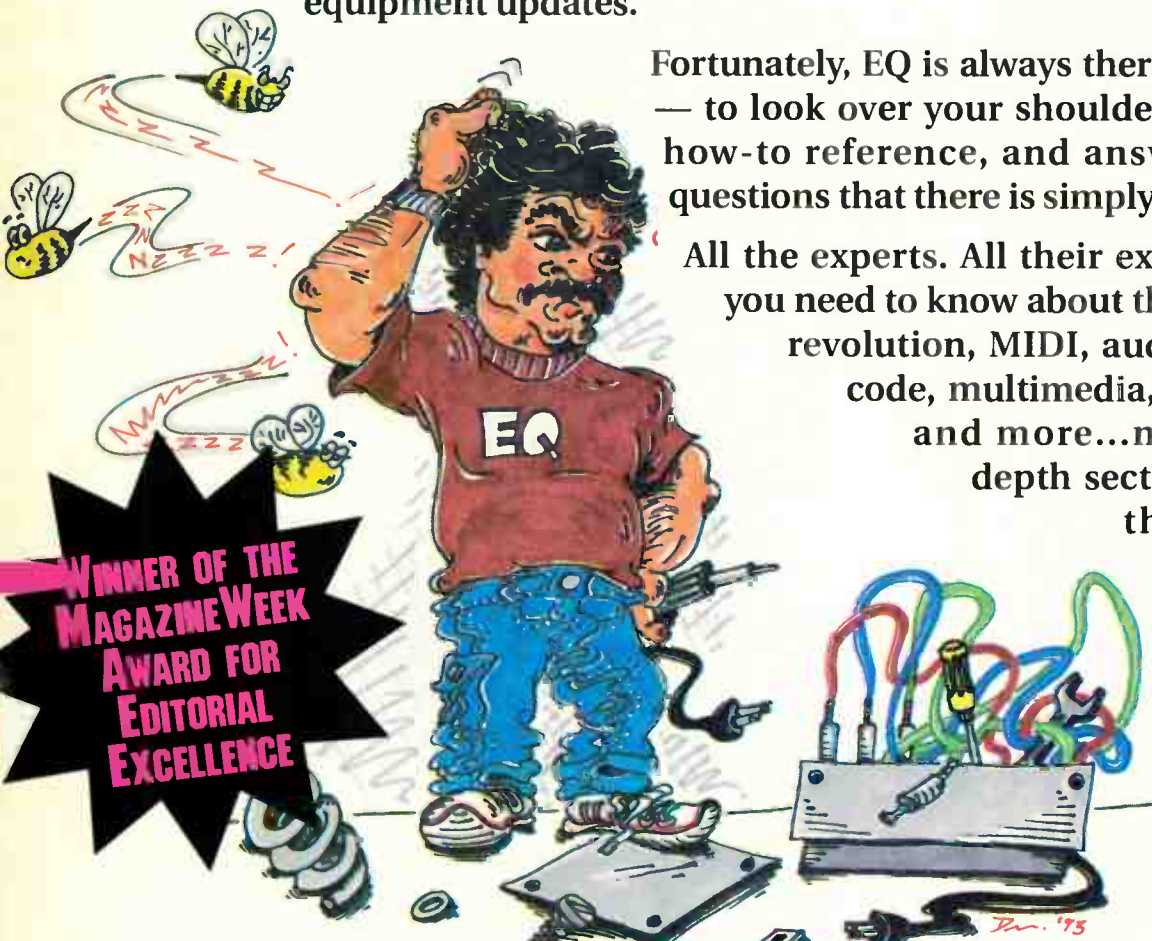
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any track at any time point (standard SMPTE timecode is used as a reference, and you can also lock playback to incoming SMPTE code). If you have a CD-ROM player, you can also use the program to play back selected tracks from an audio CD at specific points in time. Just as in a MIDI sequencer, individual tracks can be muted or soloed.

The overriding concept is to have these various tracks (each of which can contain a different type of media file) play back in sync with one another on a Stage, which can either be part or all of your monitor screen, or a dedicated second monitor, if you have one. This is no small task for a personal computer — even one with the power of the Macintosh — and the end result will vary widely depending upon your particular machine and its configuration.

For example, I tested the program on an unaccelerated Mac IIci with a 64k cache card (no slouch, but nowhere near the top-of-the-line Mac, either) and I found that synchronization worked with complete accuracy only when no more than two or three elements were played back simultaneously. Performance improved somewhat when I changed my monitor setting to eight-bit colors (graphics screen redraws require the most computing power), but, of course, the tradeoff was reduced graphic quality. In no instance, however, did audio quality suffer — both digital audio and MIDI files played perfectly, without a hiccup. Instead, the visual displays tended to get jerky and occasionally even fall behind the audio. Passport states that the program requires a Mac II or higher, but my experience suggests that it really only performs at full power on the bigger and faster (and more expensive) Macs such as the Quadra or new Centris series.

Passport Producer isn't just about playing back prerecorded files — the program also gives you an opportunity to create new files, or to edit your files in context, by providing internal editors as well as links to many popular editing applications.

For example, MIDI files can be directly edited in any of the Passport MIDI sequencers (Pro 5, Trax, and Audio Trax) as well as in MOTU's Performer or Digital Performer and Opcode's Vision and Studio Vision. When you select one of these editors from within Producer, the application launches, with the selected MIDI file loaded and ready for editing. The exception is with Vision and Studio Vision, which, because they do not support Apple Events, successfully launch but do not load the MIDI file. Similarly, audio files can be edited in Passport's Alchemy, Digidesign's Sound Designer, or Macromedia's Sound Edit. When you quit the selected editor, you are automatically returned to Producer. If you saved the changes you made, your newly edited file can then be immediately played back synchronously along with other tracks.

The internal editors for MIDI and digital audio files are somewhat no-frills, though, to be fair, Producer is not intended to serve as either a MIDI sequencer or digital audio editor. The audio editor supports basic cut, copy, and paste functions as well as providing zoom-in, zoom-out, and area silence routines. Unfortunately, all digital audio edits made with this editor are destructive and affect the original file permanently, so you might want to make sure you have a backup copy safely made before you proceed here.

The MIDI editor provides an impressive on-screen mixer that allows you to adjust track levels and panning in real time as well as transpose or reorchestrate your music with program changes. The dynamic changes you make here, however, are not recorded (only a snapshot of the final fader positions is), so it does not allow you to do automated mixing (to do this, you'll need to go to one of the external MIDI sequencers that supports that function). There are also internal editors provided for QuickTime movies and other graphics media file types, as well as a slide editor that allows you to quickly and easily create slideshow presentations from standard text files.

Passport Producer also enables you to record new 16- or 8-bit AIFF digital audio or standard MIDI files "on the fly" while watching the other elements of your multimedia presentation play back on the Stage. This is an excellent feature that allows you to record narration while watching the visual presentation or to trigger MIDI or digital audio sound effects in sync with the on-screen graphics. But, owing to the fact that the program always assumes that newly recorded MIDI data is recorded at an unchanging 125 bpm, you can't really use this for the recording of complete MIDI musical passages unless you're somehow working at precisely that tempo (unlikely) or are doing extreme free-form music that will require no quantization afterwards. In addition, no click track is provided — even though the manual does tell you how to create one yourself in a MIDI sequencer. I can't help but think that it wouldn't have taken much effort for Passport to include a simple 125 bpm MIDI file click track with all the other (mostly excellent) clip music examples that are provided.

Last, but by no means least, the accompanying documentation — a detailed tutorial booklet and a comprehensive reference guide — is well written though somewhat weighted towards the graphic functions of the program. Overall, it's clear that Passport has delivered a knockout punch with Passport Producer — they've achieved the rarity of producing a singular type of software that solves a whole array of synchronization problems for the multimedia producer. If you're a musician using a Macintosh and you are interested in getting into multimedia, it's hard to imagine another program that can be more useful to you than this one.

—Howard Massey

Howard Massey heads up On The Right Wavelength, a MIDI consulting company. His latest book is The Complete Sound Blaster.

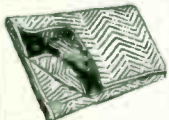
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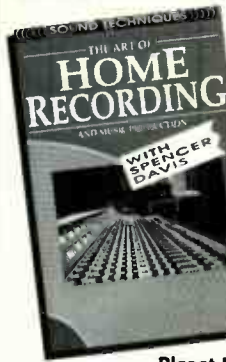
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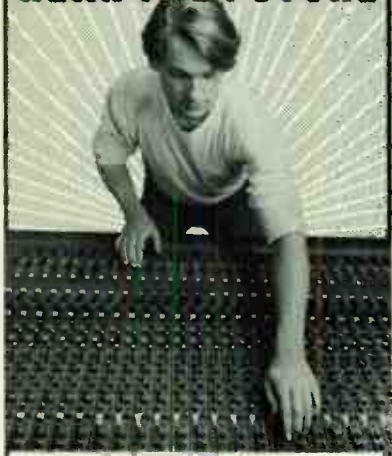
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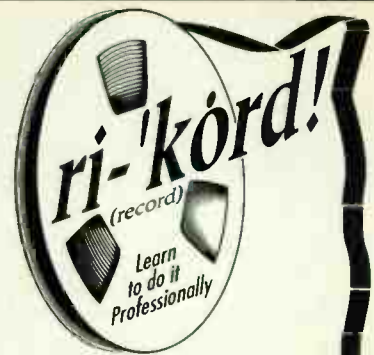
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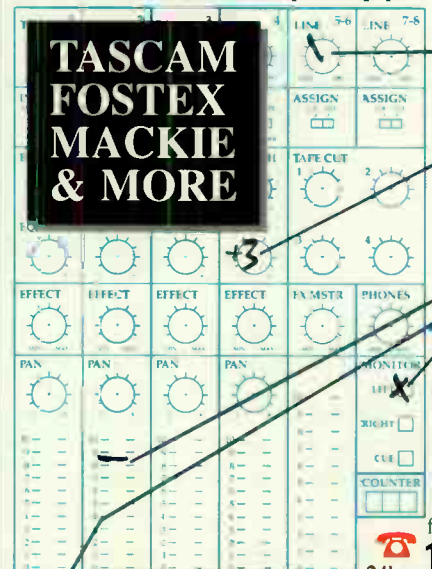


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DAVID HAFLE, for whom the company is named, was responsible for the design of those wonderful Dynaco amplifiers that introduced many of us to the sound of a quality power amp. I built a Dynaco Stereo 150 (75 watts/ch — a medium-power amplifier at the time) from a kit, and that amplifier is still in service 18 years later. The new Trans-Nova design is the work of Professor Jim Strickland, the Hafler engineer awarded a patent for the electronic circuit design used in this new amplifier series. Strickland deceptively uses FET devices in a simple three-stage circuit that significantly reduces the components in the signal and

sidechain paths of the audio circuitry.

The result of this foreshortened audio path is an amplifier that really does stay out of the way of the signal. The amp has a very open, transparent sound stage that allows imaging detail and depth to be revealed in high-quality recordings. Of course, the limiting factor is always the loudspeaker used, but if excellent loudspeakers are at hand, then the Hafler model 9500 is capable of delivering sufficient current and voltage swing to really display the subtleties within the recording.

The 9500 provides two channels with 250 watts into 8 ohms or, in

bridged-mono mode, 750 watts into 8 ohms. The signal-to-noise ratio is typical of all good amplifiers these days, in excess of 100 dB. The Techron TEF 20H1 measured the Total Harmonic Distortion to be below 0.03 percent and the frequency and phase response to be absolutely flat throughout the audio band. It was one of the most boring-looking measurements I have ever done, leading me to believe the manufacturer's specification that the full-power bandwidth really is 0.15 Hz to 300 kHz. This does, however, leave open the possibility that in some applications it would be very wise to filter RF noise out of the signal just before it reaches this amp; otherwise you may one day find that your loudspeakers don't have any high frequencies because someone keyed a poorly adjusted CB radio and dumped 250 watts of 100 kHz noise into your tweeters. Perhaps Hi-Fi enthusiasts do not worry about these things as much as those of us who depend upon our loudspeakers for our livelihood.

The Trans-Nova 9500 I received had a silver-colored brushed-metal 19-inch rack-mount front panel, three rack units high. This was, however, a "Hi-Fi" version of the amplifier. The "professional" version will not be



available until sometime this fall. This means that presently the input connection is made with unbalanced gold-plated RCA or phono jacks.

Although still popular in consumer audio products and some project studio equipment, the *phono* connector (not to be confused with the 1/4 inch *phone* connector, i.e., headphone) has never been welcome in professional audio. There have been some heroic attempts to make a reliable and practical cable connector that mates with the phono jack, but only one of these (Neutrik Profi phono connector — NC2C/2) has overcome the principal drawback of this connector — that ground is connected after the signal. Connecting the signal ground last can result in massive transients being sent to the device and, in the case of a power amp, on to the loudspeaker with catastrophic results. Input circuitry can even be destroyed by ground differentials when equipment is connected using a typical phono plug. These problems do not usually occur if all the equipment is off when connected, but only a real optimist would expect that to always be the case. Even the Neutrik NC2C/2, which does make ground first, does not suit every phono connector application, but is certainly worth checking out if you must use this form of connector.

The drawbacks of using a phono connector also include the problem of interfacing balanced professional audio equipment with an unbalanced device. We have all become accustomed to the series of workarounds for dealing with this problem, but I would prefer to wait for the professional model that will include balanced XLR-type input connections.

The 9500 does not include any form of input attenuator, so end users will be required to make necessary gain-structure changes in their monitor chain before the amplifier. (My preference in many applications, anyway.) An attenuator that can be calibrated and mounted externally to the amplifier can have many advantages, not the least of which is that should

an amplifier fail, an identical unit can be substituted without guessing at the level setting of the previous amp.

The 9500 is, in fact, a very minimal amplifier. It offers no visual indication for out-of-limit signal conditions such as clipping, DC voltage, or RF noise. The front panel simply has an illuminated power switch. The rear panel has the aforementioned phono connectors; two sets of five-way binding posts; a switch for selecting between stereo or bridged-mono mode; and the IEC-type AC power connector. The sides and much of the rear panel are covered with the heat-sink fins for convection cooling of the amp. The amp is not modular and service requires removing a series of hex-head screws to access the components inside. Although field service is discouraged by the manufacturer — a seven-year warranty is offered instead — the full component layout and circuit diagrams are included in the owner's manual.

The Hafler 9500 delivers audio signals to the loudspeaker in a manner that makes the job seem effortless. There is sufficient power to retain peak headroom at significant sound pressure levels in all but the least efficient loudspeakers and the bridged-mono mode is capable of driving 8-ohm subwoofers with considerable force. The 9500 is not specified to drive extremely low impedances, but the manual states that the unit will cope with low impedances but pays a penalty in heat production. This is typical of many amplifiers that are not designed to drive 1-ohm loads. The 9500 has the advantage of using lateral MOSFET output transistors that are not susceptible to thermal runaway. So, while low-impedance loads will warm up the room, they probably won't cause the amp to burst into flames.

The tubelike circuit design gives us an amplifier that sounds as nice amplifying a string quartet recording as it does reproducing a thrash band at concert level. I can't wait to hear the professional version.

—Wade McGregor

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SHORTS

WC Music Research "DNA Groove Templates"

"By applying these templates, you have the potential to make your sequences sound like they were laid down by the drummers on those classic tunes."

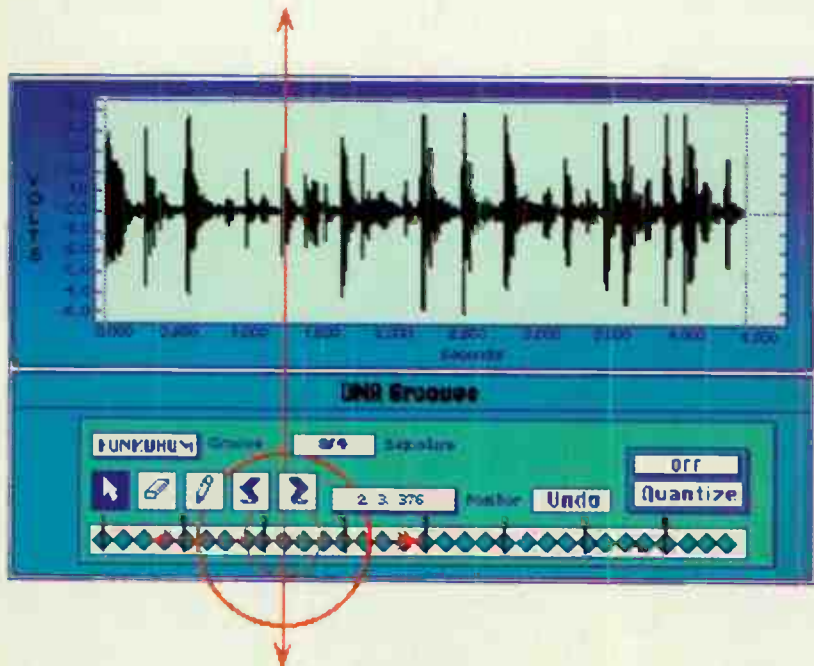
One of MIDI music's greatest problems is that too much of it is rhythmically perfect. Quantization, that ubiquitous and tempting tool, creates rhythms that a real musician would never play. Human beings push and pull the rhythm — it's one of the major factors that makes live music exciting. Ironically, sequencers are perfectly capable of recording this give and take, but too many people ignore that and depend on quantization to cover up their less-than-ideal keyboard chops.

One solution is to record a rhythmic phrase from a record into a sampler and repeat it over and over underneath the original melodies and harmonies. This works fine for dance music, but its use in other genres is pretty limited (and the legality of it is sometimes hazy). A better solution would be to find some way to extract the "essence" of a great drummer's playing and apply it to original rhythm tracks.

WC Music Research, a Toronto-based software company, have found that solution. They have come out with a line of "Groove Templates" (\$110) they call "DNA." These templates are tiny computer disk files that are used in conjunction with Steinberg's Cubase sequencer on the Mac, Atari, or PC.

Cubase has a feature called "Groove Quantize" that takes a track and moves individual notes back and forth in time according to patterns of late and early timings, which are user-definable. For example, you can have it advance beats 1 and 3 in a bar and delay beats 2 and 4, for an R&B-ish "in the pocket" feeling. These patterns can be stored as a separate file and loaded into any other sequence — and that's what WC's DNA Groove Templates are.

The files were created from the playing of real session drummers. The



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EQ MAGAZINE WE DEFINE THE PROJECT STUDIO

project studio \praj-ekt 'st(y)ud-e-o)\ *n* **1** : the personal work place of a musician, engineer, songwriter, producer or multimedia artist, designed to maximize musical and sound creativity in an affordable technical environment **2** : the most active aspect of the professional recording and sound market circa 1993, due to advancements in desktop audio, MIDI, hard disk recording and developments in affordable analog and digital technology **3** : the market trend first defined by EQ Magazine in 1990, which now serves its readership with practical, hands-on, how-to information



REVIEW SHORTS

folks at WC precisely analyzed the drum tracks on a number of well-known songs, in various styles, and created quantization files based on the timings of the beats and subbeats on the recordings. By applying these templates to your tracks, you have the potential to make your sequences sound as if they had been laid down by the drummers on those classic tunes.

Most of the 36 songs (they come six to a disk) released so far are based on straight-ahead 16th-note grooves, but WC has gone farther than that, and applied the same timing adjustments to 10 different beat patterns for each song, so that you can apply the feel to a 3-against-4 pattern, triplet 16ths, 8th-note shuffles, 32nds, and so on. Also supplied are variations on the grooves, which push or pull specific beats, individual pulses within beats, or fills.

The concept is pretty easy to understand, although it can take a while to figure out the best way to use the grooves. The authors encourage experimentation, such as using different grooves on different parts of a drum set. The company is looking at ways to include duration and velocity information into its files in the future and is also talking to other sequencer manufacturers about making their programs work with WC's grooves. In addition, they have put together a package featuring Clyde Stubblefield, legendary drummer for James Brown, the first in a planned series of "Beat Blocks" featuring different drummers. It consists of a CD with several hundred two-bar patterns played by Stubblefield on an acoustic drum set, and a floppy disk with the grooves from those patterns. It's distributed by East West Sound Warehouse, tel: 213-848-8436.

WC is to be commended for introducing a marvelous idea that can't help but improve the quality of many MIDI musicians' sequences. I'm looking forward both to playing with it more, and to seeing where WC can go with it.

—Paul D. Lehrman

Contact WC Music Research at PO Box 1275, Station K, Toronto, Ontario, Canada M4P 3E5; tel. 416-444-6644. EQ free lit. #123.

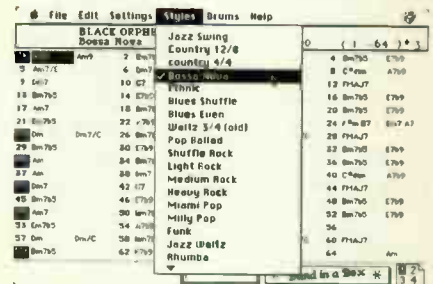
PG Music's Band-In-A-Box

"Band-In-A-Box can't be easily characterized, simply because it's so many things."

It's easy to fall into technology's trap, where you get so wrapped up in how things work that you lose sight of what it is you're trying to accomplish in the first place. This is particularly true for the MIDI musician who uses a computer to aid and abet in the process of creating music. But isn't it written somewhere that making music is supposed to be fun?

I think it is, and if you're anything like me, the fun factor may have evaporated somewhere between the time you got your MIDI interface correctly configured and the first time your computer crashed. But there's hope for us yet, in the form of a terrific little program called Band-In-A-Box.

Band-In-A-Box (\$59 [standard edition], \$88 [professional edition]) can't be easily characterized, simply because it's so many things. It can act as a programmable autoarranger (in this regard it emulates the one-chord arranger functions found on many home organs and on devices like the Yamaha QY10 and QY20), and it can also take on the function of a rudimentary MIDI sequencer. It can be used for "Music-Minus-One" practice sessions, and also as a drum pattern editor — it even has some "algorithmic composition" components. Perhaps most important, if you're doing live gigs (and are willing to take your computer onstage with you), Band-In-A-Box can literally live up to its name, providing flexible accompaniment for your sterling performance. Adding to this chameleon-like quality is the fact that essentially identical versions of the program are sold for each of the "Big Three" computer systems — Macintosh, Atari, and IBM (both Windows and DOS versions are available,



and all major PC sound cards are supported).

The basic premise behind Band-In-A-Box is that you apply a "style" — a preprogrammed accompaniment that includes drum patterns, bass line, and chording—to any "song," which consists, naturally enough, of a specific chord progression and melody line. You can create your own styles (and songs) from scratch, using either the mouse/computer keyboard interface or input from a MIDI controller, or you can simply choose (or edit) one of the preset styles. The standard edition comes with 24 of these; the professional edition comes with 75. There are also several dozen preprogrammed complete songs provided, including most of the standards you'd need for a wedding-type gig.

As icing on the cake, your entire Band-In-A-Box performance can be recorded and saved to disk (optionally as a standard MIDI file, for exportation to a MIDI sequencer). Much as I'd love to see it, there's no provision for importing a MIDI file into Band-In-A-Box. The owner's manual (which is dense and somewhat confusing) gives fairly detailed instructions for exchanging files between computers or transferring from computer to hardware sequencer.

—Howard Massey

For more information, contact PG Music, Inc. at 266 Elmwood Avenue, Unit 111, Buffalo, NY 14222. Tel: 800-268-6272; 416-528-2368. Fax: 416-628-2541. EQ Free Lit #: 124.

Howard Massey heads up On The Right Wavelength, a MIDI consulting company. His latest book is The Complete Sound Blaster.

ACROSS THE BOARD

continued from page 130

armed at the machine. When you punch into Record, the track you thought you disarmed goes into record also. Not a good thing. On one occasion, with the two machines locked up and the slave in Record, I punched Stop on the master machine and the slave kept right on going, still in Record. In both of these instances, if the machines had been in a separate machine room, I would have been dead. Probably shot by Walter for erasing lots of stuff.

The service part of Sony was great, though. They got Don Eklund over to Maui on the weekend to get things straightened out. Some of the problems seem to be in software that hasn't been fixed yet.

As a final thought, let me say that technology at its highest level allows only big companies like the Sonys of the world to produce complex pieces of equipment such as the 3348 and the 3324S multitracks. Any piece of gear this complex is bound to suffer from infant mortality. I have no problem with that,

WE INTERRUPT THIS COLUMN...

Dear Roger:

Sony's reputation for timely delivery of products that work perfectly "out-of-the-box" has been achieved as a result of years of consistent performance. On the other hand, in this particular instance, to use your reference, "Murphy" was our co-pilot. Perhaps a squadron of "Murphy's" would be more like it. Everything that could go wrong, did. In any case, we are reviewing our handling of this order to ensure that this type of problem does not occur again.

Regarding the technical difficulties you mentioned, we talked with Don Eklund, the Sony service engineer who went to Maui (he appreciated your kind words, by the way) to look after the machines. He indicated that he was unable to reproduce the "track arming" problems cited in the column during his visit to Maui and that these problems have not been reported by other customers so far. This doesn't rule out that these problems occurred, and we are hopeful that we can quickly get to the bottom of the issue.

As a happy user of Sony digital multitracks for quite a while, we look forward to a continued constructive relationship with you and are pleased that, despite the difficulties you have experienced in the last few weeks, that you and Walter would still choose Sony if you had to do it over again.

Courtney Spencer
Vice President, Audio Products
Sony Business and Professional Products Group

and present my experiences here so that others who wish to own a 3324S can avoid disaster. Remember, Murphy is my co-pilot. It is my job to lose a master tape once in a while so that you don't have to. Walter and I would still choose Sony machines if we were starting again, but after reading my column I know what to watch out for.

P.S.

Well, on this trip to Maui working on

Walter's album, I am staying in a house by the studio. It is paradise up here, overlooking the islands. The shower is outdoors, surrounded by lava rocks and exotic plants. I went out earlier to take a shower, but there was a yellow and black spider blocking the only way in and out. I'm not saying he was big, but I ran his license plate number through NCIC and found out that he had a record. It said, "24 people frightened, 16 bit." **EQ**

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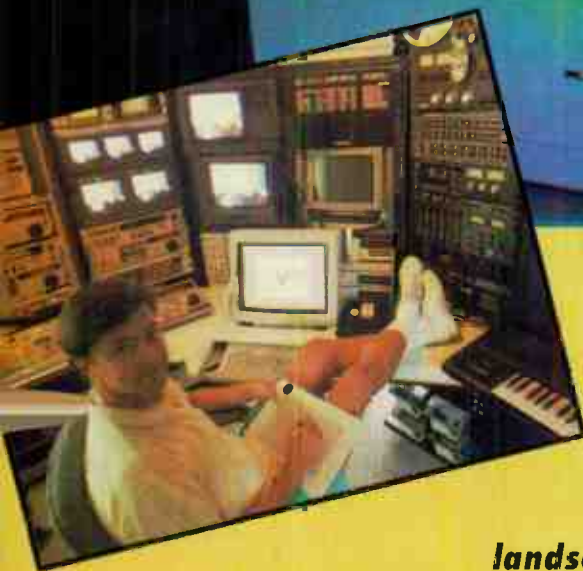
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Photo by Ed Colver

If only doing it digitally was as easy as 1's and 0's

BY ROGER NICHOLS

A quick little DAT timecode caveat. If you've read any of the technical manuals that come with some of the timecode DAT machines, you know that there is an added benefit to recording timecode on a DAT tape. The plus is that you can record one timecode format, such as 24 fps, and play back in another format, such as 30 fps, thereby performing a timecode format conversion. I have used this to my advantage a few times.

The reason for this is that the internal frame rate for DAT is actually 33 1/3 frames per second. Since this does not easily relate mathematically to any of the other frame rates, what is actually stored on the DAT tape is its own internal time reference, *not* the actual timecode that you patched to its timecode input. Who cares? Well, you may care when you can't lock up your timecode DAT properly. Let me explain.

When you record timecode on an analog piece of tape, all of the bits are recorded just the way they come in. The phase relationship of all of the bits in the timecode to the audio on your analog tape is the same when you play it back as it was when you recorded it. It ain't necessarily so with DAT timecode. In order to have everything come out right, the timecode bit rate must have some relationship to the sample rate of the DAT digital audio.

Synchronizing the timecode with the digital audio can be done more than one way. The easiest is to send the tape out and have somebody else do it. Another method would be to generate the timecode with the generator built in to the DAT machine. The built-in generator is always synchronized with whatever sample rate is being used. The same is true of digital multitrack machines. If they have an internal generator, it is synchronized with the sample rate. If you transfer audio digitally from multitrack to DAT and transfer the timecode from the multitrack simultaneously, you will be in good shape.

Yet another foolproof method would be to have the timecode generator and the DAT machine synchronized to a common reference such as video sync. The DAT sample rate clock will be derived from the video sync signal and so will the timecode bit rate. Everybody will be happy.

When I mix a project, I also print the mix to my timecode DAT machine, feeding it the timecode from the Sony 48-track. If at some later date I need to add some more guitar, I can lock up the mix with the 48-track and just add in some more guitar without recalling the entire mix. The problem here is that if the multitrack is at 48k and the mix DAT is at 44.1k, there will be some slippage because the timecode is referenced to the multitrack sample rate and not the DAT sample rate. This will have the same ill effects as recording free-running timecode onto the DAT machine.

To solve the problem, use video sync as the common source of reference between the multitrack and the digital mix machine. If you are using external

A/D converters, most of them will accept video sync as a reference for generating the sample clocks. When you go to lock the two machines back up, use the video sync reference for both decks and the lockup will be flawless.

The days of striping analog tapes with free-running timecode are over. If you want to avoid problems, remember, when it comes to *sync* or *swim*, proper synchronization will keep you from having to jump off the deep end.

BIGGER FISH TO FRY

Most of the time you can't go wrong with a Sony product. Usually, if there are two pieces of electronic equipment that perform the same function, one made by Sony and one made by someone else, I would choose Sony and never look back. I have had nothing but good luck with the Sony 48-track, but I can't say the same for the new 3324-S 24-track machine. Walter Becker recently got two of them for his project studio in Hawaii.

We decided on two 24-tracks instead of one 48-track for a couple of reasons. One: We could make safeties of master tapes without going to an outside facility. Two: With two 24-tracks locked up, we effectively could have an infinite number of slave tapes. Walter placed the order and we waited.

There were delays in getting the machines. On the projected delivery date, we had five musicians sitting in Maui waiting to record. Sony knew we were in desperate need of the machines, but the machines still sat on a loading dock in San Jose for a week.

To make a long story short, when we got the machines, one of them didn't work. The heads were plugged in backwards after checkout in San Jose. We found out that the salesman didn't really know what was required to do what on the 3324S. It turns out that Walter needed to purchase more options at \$2000 to \$6000 each. All this with musicians sitting in the studio for a week waiting.

As we used the machines more, we found little things that Sony still hasn't fixed. Sometimes when you disarm a track on the remote, it stays

continued on page 128

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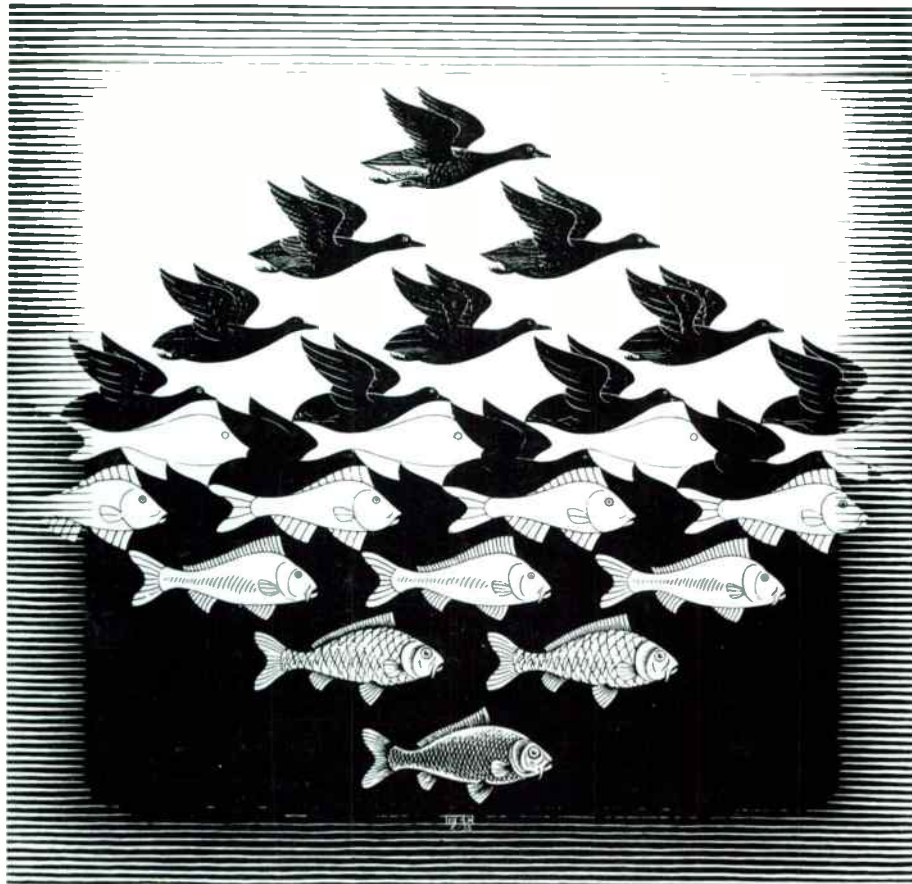
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If you think only your eyes can play tricks on you...



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

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

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

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

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

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