Creating multiple mixes • Tascam 788, Roland XV-5080, and 8 more reviews

Electronic Musician®

www.emusician.com

November 2001

TRUTH OR CONSEQUENCES

IMPROVE YOUR STUDIO'S ACOUSTICS

DIRECT ACTION

EVERYTHING YOU NEED TO KNOW ABOUT TUBE DIRECT BOXES

FOLLOW THE MONEY

WHO REALLY MAKES THE DOUGH IN THE RECORDING INDUSTRY?

COMPOSING WITH JAVA

FREEWARE GALORE

#BXNMDSF **********AUTO** 3-DIGIT 109
#10987LNG616EG008# JAN 2004 ECMN 122
GEORGE LANGBERG
9F
S0184
616 EAGLE VALLEY RD
TUXEDO PARK NY 10987-4740

A PRIM

$6.95

0 71486 01816 2

NEW! 24-TRACK 24-BIT HARD

For a limited time, get Mackie's non-

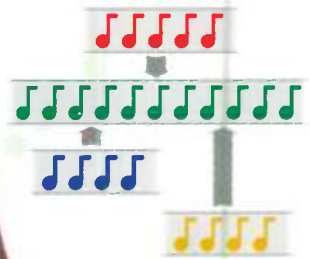
- Plug-and-play recording
- 20Gb internal recording drive plus pull-out bay for removable M90 hard disks and Mackie Media Project ORB™ drives
- 24 Tracks and 192 Virtual Tracks for up to 100 minutes of continuous recording @ 48kHz
- 24 channels of 24-bit, 48kHz analog I/O included!
- Full Meter Bridge
- Transport Controls, Track Arm buttons, Locate and Loop
- 100 BaseT Ethernet port
- 3.5 inch drive bay for importing tempo maps and software upgrades
- Sync to SMPTE, MIDI, Word Clock and NTSC/PAL video blackburst
- Non-destructive cut, copy and paste editing with 999 levels of Un-Do
- Perfect ADAT® or DA-88 replacement for home or project recording

LINEAR vs NON-LINEAR RECORDING.

Tape-based recorders (and even some hard disk recorders), record in a linear manner. They record data in a continuous "stream" (the green stream of notes in our drawing).

If you want to change something on a track, the recorder permanently erases the old data and records new data over it (red notes in the drawing below).

*The **non**-linear MDR24/96 records any number of alternate segments on separate parts of the hard disk and automatically "punches them in" during playback. You never lose your any previous work.*



©2001 Mackie Designs Inc. All Rights Reserved. Mackie and the Running Man figure are registered trademarks of Mackie Designs. Mackie Media Project is a trademark of Mackie Designs Inc. ORB is a trademark of Castlewood Industries, ADAT is a registered trademarke of Alesis.

DISK RECORDING FOR $1999*

linear MDR24/96 at a special intro price.

Greg Mackie's goal has always been to deliver professional creative tools at reasonable prices.

The new MDR24/96 is our price-busting commitment to nonlinear hard disk recording. Read about its rich feature-set and you'll see we didn't skimp anywhere.

PLUG AND PLAY RIGHT OUT OF THE BOX.

Now you can retire those tape-based digital recorders and enjoy the convenience and enhanced creativity that comes with instant-access hard disk recording.

Ready to go with twenty-four channels of analog I/O *already installed*, the MDR24/96's familiar tape recorder style controls and simple operation will have you tracking and mixing down in no time.

TWO REMOTES. TWO REMOVABLE MEDIA OPTIONS.

Remote 48 (*Remotus Deluxai Way-coolus*)

Our new recorder uses the same affordable, removable recording and backup drives as our landmark HDR24/96 Recorder/Editor. Mackie Media Project M90 pull-out drives and 2.2GB ORB™ disks make saving and storing projects a breeze. (And of course the MDR24/96 ships with a 20Gb internal hard disk to get you started).

Removable ORB™ drive (*Songus Backupus Sneakernetai*)

It also uses the same compact Remote 24 and ultra-mondo Remote 48 controllers.

NON-LINEAR MEANS NEVER HAVING TO SAY YOU'RE SORRY.

Remote 24 (*Getzajobdonus Economical*)

The MDR24/96 is a *non-linear*, *non-destructive* recorder. That means you can punch-in "over" a section of a song as many times as you want without erasing it — and then choose the take you like best later (see explanation on the lefthand page). Non-linear recorders also use drive space more efficiently than linear or "tape mode" hard disk recorders.

You can do basic cut, copy and paste editing with 999 Un-Do levels using the MDR24/96's front panel controls.

MIX AND MATCH 'EM!

Run MDR24/96s alone or in pairs with any analog or digital mixer. Slave it to the HDR24/96 Recorder/Editor and Remote 48 controller and scrub tracks right down to the waveform level for ultra-precise editing. Or install MDR24/96's in your 'B' and 'C' rooms and edit projects on an HDR24/96 in the 'A' room.

***GOTCHA-FREE FINEPRINT!**

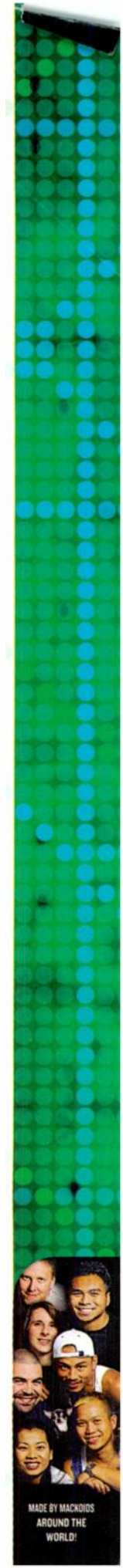
No, you don't have to buy six MDR24/96s to get this price. But we *do* have to point out that $1999 is suggested U.S. street price and that your price may vary. This is a limited time, introductory price and it *will* go up after our bean counters come to their senses and make us stop practically giving MDR24/96s away.

So don't tary, Harry. Don't wait, Kate. Check out the no-compromise MDR24/96 24-track hard disk recorder at your Mackie dealer today. ■

Mackie Media 20Gb M90s (*Hardiskus removabalis*). 24-track recording capacity @48kHz is typically 90 to 100 minutes.

MACKIE®

800.898.3211 • www.mackie.com



The beast in a titanium cage.

THE NEW *Fantom* WORKSTATION

76 KEYS · OVER 1000 SOUNDS · D-BEAM CONTROLLER · SRX-EXPANSION ·
FLEXIBLE LINEAR AND PATTERN RECORDING · REALTIME PHRASE SEQUENCING ·

90 MULTI-EFFECTS · NEW VARIABLE ARPEGGIATOR

INTUITIVE DESIGN · OUR BEST EVER · ***NOW GO PLAY.***

Roland®

FAXBACK INFO: 323.890.3780 DOC#10563 · PHONE: 323.890.3700

WWW.ROLANDUS.COM

"Phantom" is a registered trademark of and is licensed by Phantom Guitar Works.

I N S I

FEATURES

42 DIRECT ACTION

When musicians and engineers talk about using tube-based signal processors to "warm up" sounds, tube direct-injection (DI) boxes are too often overlooked and underappreciated, despite being a mainstay of the modern signal path. This article explores the world of tube DIs, including a comparative evaluation of eight models.

By Michael Cooper

62 COVER STORY: TRUTH OR CONSEQUENCES

To perceive the true character of your mixes, you need to listen to them in a well-tuned control room with a flat frequency response. Even acoustically treated rooms can have uneven, flawed frequency responses unless you take additional measures. Here are two tried-and-true methods for making your personal studio into a quality listening environment.

By Michael Cooper

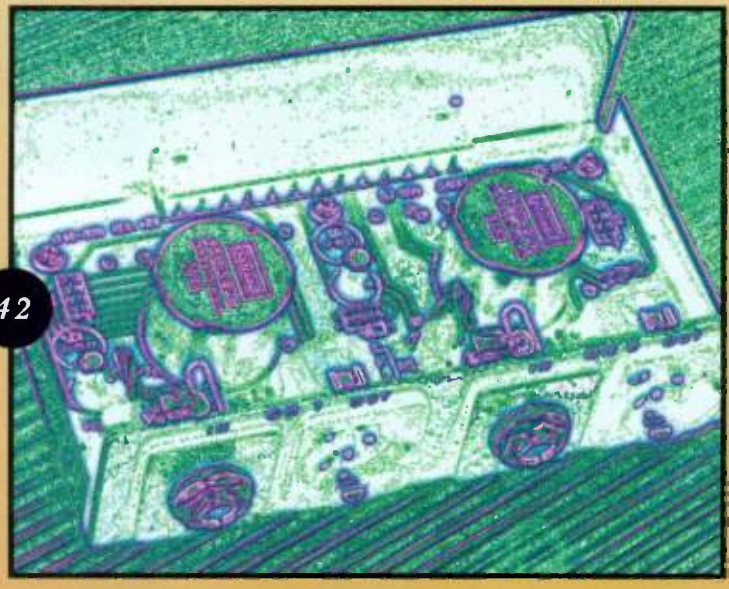
78 MARK MY WORDS

Markup languages tell a computer how to properly place text onscreen and in print, and they are critical to making the Web work for you. EM explains the most common languages, indicates which are the most essential for musicians to know, and shows you how to use them effectively.

By Alan Gary Campbell

62

Cover photo by Leslie Hirsch



42

DEPARTMENTS

8 FRONT PAGE

12 LETTERS

14 FIFTEEN YEARS AGO IN EM

20 WHAT'S NEW

30 WEB PAGE

34 VINTAGE PAGE

192 AD INDEX

196 MARKETPLACE

201 CLASSIFIEDS

Electronic Musician® (ISSN 0884-4720) is published monthly by PRIMEDIA Business Magazines & Media Inc., 6400 Hollis St., #12, Emeryville, CA 94608. © 2001. This is Volume 17, Number 11, November 2001. One-year (12 issues) subscription is $36; outside the U.S. is $85. Periodical postage paid at Oakland, CA and additional mailing offices.

Electronic Musician®
NOVEMBER 2001 VOL. 17, NO. 11
www.emusician.com

15 YEARS EM 1986–2001

COLUMNS

40 **PRO/FILE: The Final Frontier**
Kevin Moore, formerly of Dream Theater, launches *You Go Now.*

88 **RECORDING MUSICIAN: Got You Covered**
Strategies for making multiple mixes.

96 **SQUARE ONE: Going Direct**
How to use direct boxes to match all your inputs and outputs.

126 **WORKING MUSICIAN: Follow the Money**
Deconstruct the money flow in the record industry.

210 **FINAL MIX: The Art of Being Wrong**
Mistakes are inevitable; how will you handle them when they arise?

REVIEWS

132 **TASCAM 788** portable digital studio

142 **ROLAND XV-5080** synthesizer module

150 **MOTU 828 (Mac/Win)** computer audio interface

156 **PSP StereoPack and MixPack (Mac/Win)** audio plug-in bundles

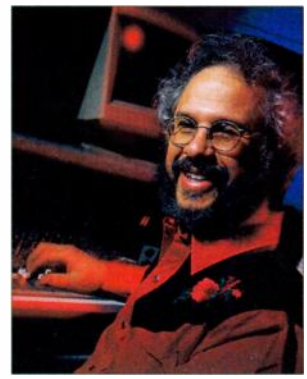
162 **WAVES Gold Native 3.0 (Mac/Win)** audio plug-in bundle

172 **PRESONUS DigiMax** mic preamp and A/D converter

178 **STARR LABS Ztar Z1 and Z1-S** MIDI controllers

184 **QUICK PICKS:** **Sonic Implants** *Afro-Cuban Percussion* (GigaSampler) sample CD-ROM; **IK Multimedia** *T-Racks* 24 (Mac/Win) mastering software; **Sonic Foundry** *World Pop Loops for Acid* sample CD-ROM

Lessons Learned


ANTHONY PIDGEON

One of the important ways the music industry differs from most "mainstream" industries is the relatively low emphasis on academic training. That is typical of industries that involve or support the creative arts. The tradition in the creative arts focuses more on studying with a mentor than on going to school, and even on the business side, many people learn their jobs by doing them.

People in the music industry just care about getting the job done—whether they produce or perform music, manufacture music products, run a talent agency, or teach private lessons. You get most jobs in this industry based on networking, experience, and a proven ability to deliver. After all, if you must have that special guitar part on your new song, you don't care whether the guitarist has a music degree. In America most audio engineers have no degree in audio engineering; often they have no degree at all. Many successful manufacturer marketing reps came up through the music-store ranks and have no schooling in marketing.

That's less common in mainstream businesses that aren't directly related to the creative arts, especially in the professions. Attorneys, doctors, accountants, and schoolteachers cannot practice unless they've been certified. For that matter, truck drivers need a license to drive big rigs, and many attend truck-driving school.

On the positive side, the lack of emphasis on formal training promotes the set of values often dubbed the American Dream. If you develop your abilities, work hard, and take care of business, you can be successful.

On the downside, we in the music business put up with a certain amount of bumbling and reinventing the wheel. We also see surprisingly unprofessional behavior; our industry often tolerates an amazing degree of flakiness and unreliability. Admittedly, we're in an industry filled with musicians, which means we have a disproportionate number of free spirits and creative wackos. That can make things interesting and entertaining, but it also can be frustrating.

Although not a requirement, academic training is nevertheless highly desirable in our industry. Mentoring is great, but a full academic education (which should include mentoring) adds considerable value. A well-trained musician is more likely to be able to step in and give you what you want with minimal fuss. Audio engineers with degrees in engineering understand why sound and recording equipment works the way it does and how to use that knowledge to get the desired results. Well-educated people often have an encyclopedic knowledge of what has been successful and unsuccessful in the past, reducing bumbling.

Perhaps most important, you need to know how to be a professional. Music and business programs can help, but even they don't always teach you how to be a good leader—or follower. You might need to learn those lessons on your own.

The music industry's openness has let many of us thrive regardless of our academic backgrounds, which is great. But if we don't have the advantages of formal training, we need to address the drawbacks with self-education and an understanding that something has been lost as well as gained by our informal approach.

Electronic Musician

Editor in Chief Steve Oppenheimer

Managing Editor Patricia Hammond
Associate Editors Brian Knave, Dennis Miller, Gino Robair, David M. Rubin, Geary Yelton
Assistant Editors Marty Cutler, Matt Gallagher
Copy Editors Erin Hutton, Jennifer Moline, Anne Smith, Mark Smith
Contributing Editors Jeff Burger, Mary Cosola, Larry the O, George Petersen, Scott Wilkinson

Web Editor Paul Lehrman

Senior Art Director Dmitry Panich
Art Director Laura Williams
Associate Art Director Karyn Kraft
Graphic Artist Mike Cruz
Informational Graphics Chuck Dahmer

Publisher John Pledger

Associate Publisher Erika Lopez
Advertising Director Joe Perry
Northwest Advertising Associate Joanne Zola
Southwest Advertising Associate Mari Stancati
Sales Assistants Kathya Fuentes, Joe Madison

Classifieds/Marketplace Advertising Director Robin Boyce-Trubitt
West Coast Sales Associate Kevin Blackford
East Coast Sales Associate Jason Smith
Classifieds Assistants Heather Choy, Monica Cromarty, Diane Williamson-Suber

Marketing Director Christen Pocock
Marketing Project Manager Angela Muller Rehm
Marketing Trade Show and Events Coordinator Alison Eigel
Marketing Coordinator Starla Estrada
Marketing Art Director Wendy Shiraki

Senior Production Manager Curtis M. Pordes
Group Production Manager Melissa Langstaff
Senior Advertising Production Coordinator Julie Gilpin
Computer Systems Coordinator Stanley Faulkner

Group Circulation Director Philip Semler
Circulation Marketing Manager Austin Malcomb
Circulation Fulfillment Coordinator Jef Linson

Human Resources/Office Manager Julie Nave-Taylor
Human Resources/Office Coordinator Janette Rosbroy
Receptionist Lara Duchnick

National Editorial, Advertising, and Business Offices
6400 Hollis St., Suite 12, Emeryville, CA 94608
tel. (510) 653-3307; fax (510) 653-5142
Web www.emusician.com

Subscriptions, Customer Service
PO Box 1929, Marion, OH 43306
tel. (800) 245-2737 or (740) 382-3322
For fastest service, visit our Web site at www.emusician.com.

Back Issues
tel. (800) 441-0294 or (913) 967-1707

Primedia Business Magazines & Media
9800 Metcalf Ave., Overland Park, KS 66212

Primedia Business Magazines & Media
Timothy M. Andrews, Chief Executive Officer
Jack Condon, Chief Operating Officer
Ron Wall, President
Pete May, Vice President, Entertainment Division
Stephanie Hanaway, Division Director of Marketing

Primedia Business-to-Business Group
David G. Ferm, President and CEO
Andrea Goldschlager, Vice President and Group CEO
Craig Reiss, Chief Creative Officer

PRIMEDIA Inc.
Tom Rogers, Chairman and CEO
Charles McCurdy, President
Beverly C. Chell, Vice Chairman

All rights reserved. This publication may not be reproduced or quoted in whole or in part by any means, printed or electronic, without the written permission of the publishers.

POSTMASTER: Send address changes to *Electronic Musician*, PO Box 1928, Marion, OH 43306. Canadian GST #129597951. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 0478741.

PHOTOCOPY RIGHTS: Authorization to photocopy items for internal or personal use of specific clients is granted by Primedia Business Magazines & Media Inc., provided that the base fee of U.S. $2.25 per copy, plus U.S. $00.00 per page, is paid directly to Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923 USA. The fee code for users of this Transactional Reporting Service is ISSN 0884-4720/2001 $2.25 + $00.00. For those organizations that have been granted a photocopying license by CCC, a separate system of payment has been arranged. Before photocopying items for educational classroom use, please contact CCC at (978) 750-8400. Organizations or individuals with large-quantity photocopy or reprint requirements should contact Reprint Management Services at (717) 339-1900. Microfilm copies of *Electronic Musician* are available by calling Bell & Howell Information and Learning (800) 521-0600 or (313) 761-4700.

Electronic Musician makes its subscriber list available to carefully screened companies that offer products and services that may interest you. Any subscriber who does not want to receive mailings from third-party companies should contact the subscriber service department at (800) 245-2737 (U.S.), (740) 382-3322 (outside U.S.), and we will be pleased to respect your wishes.

PRIMEDIA
A PRIMEDIA Publication

Printed in the USA.
Also publishers of *Mix*®, *Onstage*™, and *Remix*™.

The E-MU XL-7 on Tour with THE CRYSTAL METHOD

"The XL-7 is yet another piece from E-MU that's revolutionized our live show. Triggering sounds, locking things up - it's all at our fingertips."

The XL-7 Command Station features:

- 13 velocity sensitive pads w/aftertouch
- 40 assignable knobs and buttons
- Over 100 BPM-based synth parameters
- Up to 128 MB of sounds
- Full blown Real-time/Grid/Step Sequencer
- Controls your entire external MIDI setup

Get your hands on an XL-7 Command Station at your local E-MU Dealer today!

Check out *Tweekend* - The Crystal Method's latest masterpiece, featuring an arsenal of E-MU gear.
www.thecrystalmethod.com

E-MU®

1600 Green Hills Rd., Scotts Valley, CA 95067
Tel: 831.438.1921 Fax: 831.438.8612 www.emu.com

© 2001. E-MU Systems, Inc. d.b.a. E-MU / ENSONIQ. All rights reserved. E-MU® and the E-MU logo are trademarks owned by E-MU Systems, Inc. registered in the United States as indicated by ® and in numerous countries worldwide. All other trademarks are the property of their respective holder.

KARMA ...INSPIRATION

Technical Specifications:

- 61-key synth action keyboard with velocity and aftertouch sensitivity
- 62-note polyphony
- 32 Mbyte wave ROM, expandable to 64 Mbytes with 2 EXB-PCM expansion boards
- 640 Programs (including GM Level 2)/384 Combis – expandable to 896 Programs/640 Combis
- Support for EXB-MOSS (adds 128 new Programs/64 new Combis)
- 102 Insert/90 Master effects (up to 5 Insert, 2 Master effects plus 3-band EQ)
- 16-track 200,000 note sequencer, 200 Songs, 20 Cue Lists, 100 patterns per Song, 150 preset drum patterns, 72 RPPR patterns per Song, 16 preset/16 user Template Songs
- Joystick, 4 assignable knobs, 2 assignable switches and 1 assignable slider

KARMA Features:

- 1190 Generated Effects (1 GE per Program, 4 GEs per Combi or Song). A GE contains over 400 parameters to generate notes, control synth and effects parameters, and provide randomization of these events
- 8 knobs, 2 switches and 2 scene memories, plus joystick, slider and pedals for real-time control over GE parameters
- 4 programmable Chord Memory buttons for triggering chord voicings easily

Korg USA
316 South Service Road
Melville, NY 11747

Dear Korg,

Korg products have always been terrific, but my new Karma Music Workstation is simply amazing. I continue to be blown away every time I play it. I already own a Triton, so I'm familiar with the sounds, effects and sequencer, which are great, and I like that it's compatible with all my Triton sounds.

What makes this instrument truly revolutionary is KARMA. It's brilliant! This technology is versatile, innovative and always inspires me to come up with new ideas. I'm amazed by the control that it gives me and the way I can turn a few knobs to create a completely new part. KARMA certainly is the most unique system I've seen in a long time. I produce a lot of dance music, and this keyboard continues to breathe new life into my tracks. Plus, it saves me tons of time! But I'm afraid to bring it to a live gig because someone might figure out my tricks. (ha ha)

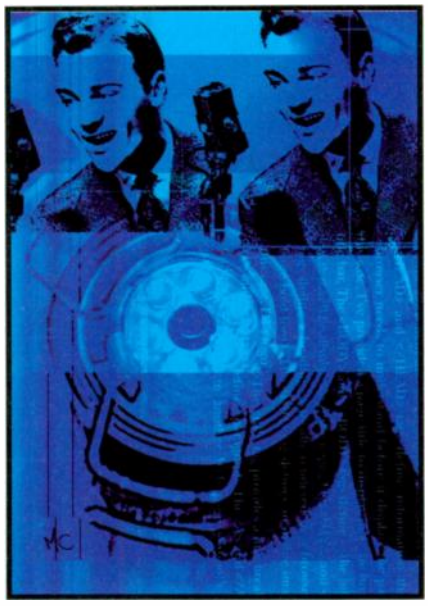
Karma is truly the most inspiring workstation I've ever played. Thank you for creating such an outstanding instrument.

Sincerely,

Chuck Johns

Chuck Johns

STORY #23
Chuck Johns Queens, NY
6/21/01
DANCE TRACKS
KARMA SESSION
KORG
KARMA
MUSIC WORKSTATION
GOOD KARMA. WICKED SOUND.
KORG
For a free copy of the Karma Video intro, write to: Korg USA, Attn: Karma Video, 316 South Service Road, Melville, NY 11747. Or visit www.korg.com/karma and e-mail us your request.
©2001 Korg USA. For the Korg dealer nearest you: (800) 335-0800. For more info via faxback: (631) 393-8530. Doc #3607.
KARMA™(Kay Algorithmic Realtime Music Architecture) is a trademark and patented technology licensed from Stephen Kay, Karma Lab LLC, www.karma-lab.com



MIKE CRUZ

MP3.COM VORTEX

Thank you for the third-party music Web sites article ("Working Musician: Keep It on the Download," September 2001). Artists often get sucked into the MP3.com routine without checking out the options. I am surprised, however, that the author didn't mention Ampcast.com. Ampcast is a great hosting site that has several advantages. You can upload any kind of music file, letting you take advantage of some newer and better compression codecs. Also, the CD program offers more flexibility and control of graphics and packaging than any Web site I've used. You can use Red Book audio (rather than reconstituted MP3s) for your CD. Add unlimited MP3 and music-file storage, six cents per download payback, and almost instant song approval, and you have a site that beats MP3.com hands down.

MP3.com can take three weeks or longer to approve a song, the digital automatic music CDs look rather cheap, and the site has a ridiculously convoluted process for updating material. I've never bothered to pay the $20 monthly fee to be treated right at MP3.com, but I can tell you the free service is more trouble than it's worth.

A. Moore
via e-mail

RADIO DAYS

Karen Stackpole dates Foley back to the heyday of radio ("Recording Musician: Sounds in the Key of Life," September 2001). If she is referring to the radio dramas of the '30s and '40s, then she should use the term *sound effects*. Ray Erlenborn, Barney Beck, Bob Mott, and Ross Murray were sound-effects engineers.

Harry Swan at CBS and Arthur Fasig at NBC were some of the earliest sound-effects engineers. Both were characterized as sound experts by their respective networks by late 1929. Author Doty Hobart profiled Swan and Fasig in the March 1930 issue of *Radio Digest*.

Beginning in September 1922, elementary sound effects were used in radio productions, with the apparatus adapted from that used in stage plays—thunder sheets and so forth. Smaller-scale effects were also employed, such as footsteps and telephone bells.

The term *Foley* is used throughout the media, but when referring to the heyday of radio drama, it is totally out of place.

Henry Howard
via e-mail

AND FOR OUR NEXT NUMBER

Hats off to EM and Gary Hall for the DVD cover story ("World of Options," August 2001). I've had to research the subject, so I can appreciate how much work went into it. It's the best DVD overview written with a user context I've ever read. Bravo.

Ralph Goldheim
via e-mail

ALL YOU NEED IS CASH?

Thanks for the article about distribution ("Working Musician: Distribution Roundtable," August 2001). It shed light on how the industry looks at the future of getting music to people. One comment by Ron Sobel touched a nerve: "We will also learn how to take advantage of digital distribution to reward and incentivize music as a service and not as a product." Thinking of creating music (or any other art) as a service is a radical shift in the relationship between the creator and his or her public.

Did John Lennon provide a service? How about Beethoven, Van Gogh, or Tennessee Williams? Food for thought.

Arnold Friedman
via e-mail

The distribution article was informative and thorough. As an unsigned artist, I don't know about many aspects of the music business. How do I get signed? What do I do with my record once it's finished? Who do I sell it to and how? Why are some bands so successful and famous?

Although the article didn't quite answer all of those questions (and wasn't meant to), it did point out one important process in getting your music heard and getting it to the world. I now know a few companies to contact, what they specialize in, and what I can expect. As an independent artist trying to make a living in the music business, I found that the article really helped bridge a lot of gaps. Thanks again for sharing the information.

Benny Sanches
via e-mail

R.E.S.P.E.C.T.

As I thumbed through the June 2001 issue, Gene Lowinger's letter ("Oppressed Males Unite!") caught my eye.

Are you kidding me? What is up with that guy? I know the dude has a right to say what he wants, and you have a

THE NEW DIGITAL WORKSTATION FOR PEOPLE WITH MORE SENSE THAN DOLLARS.

If this all-in-one digital workstation looks familiar, that's because the new Yamaha **AW2816** strongly resembles its TEC Award-nominated big brother, the AW4416. In terms of features and performance they're remarkably similar. So, the AW2816's price – just **$1,999*** complete – makes excellent financial sense. Once again, Yamaha gives you more for less.

- 16+2 track, 24-bit recording with no data compression (44.1 or 48Khz)
- 28 Input channels (including digital stereo input and dual stereo effects returns)
- Dynamic automation of all mix settings, including fader movements, parameter changes and scenes
- 2 Assignable 32-bit effects processors
- Premium Yamaha CD recorder for data and audio
- I/O expansion slot for digital interface options or the new WAVES® Y56K processor card
- Large, back-lit 320x640 display screen
- MIDI control of computer based recording systems
- 4-Band parametric EQ and dynamics on all channels, all the time**
- 18 Busses, plus comprehensive digital patch bay, with easy routing

YAMAHA

CREATING 'KANDO' TOGETHER

www.AW2816.com

© 2001 Yamaha Corporation of America, Pro Audio Products, P.O. Box 6600, Buena Park, CA 90622. For literature, call (800) 937-7171 ext. 615 or visit yamaha.com/proaudio
Yamaha is a registered trademark of Yamaha Corporation. All rights reserved. *Estimated street price **Dual stereo returns feature EQ but no dynamics

FIFTEEN YEARS AGO IN EM

Once in a while, you get an opportunity to talk with someone special, someone whose work transforms lives. In the November 1986 issue, Freff got a rare and precious interview with one of the greatest electronic musicians of all time, Wendy Carlos—and he made the most of it.

In 1986, 18 years after *Switched on Bach* put electronic music on the map for practical purposes, Carlos was preparing to release *Beauty and the Beast.* She was poised to stretch our ears with her amazing microtuning explorations. After a long introduction, Freff and Carlos had an in-depth discussion of her latest work. In addition to analyzing her compositions and discussing microtuning, Carlos offered sage advice about the importance of setting limits within which to create art rather than getting lost in a sea of possibilities.

Complementing the Carlos interview were four applications features about alternate tunings. David Doty started the ball rolling with an explanation of Just intonation. Robert Rich followed with advice about using Just intonation with MIDI synthesizers, especially the popular and affordable Sequential Six-Trak and Casio CZ-101.

Alan Gary Campbell took over from there, explaining the sound-production technology behind various electro-acoustic and electronic instruments. Campbell then described how to retune those keyboards to Just and Mean Tone tuning.

Vanessa Else's "Opening the Door to Music Math" explained the math required to understand scales and tuning. Else included tuning tables and interval-relationship formulas for Pythagorean, Even-tempered, and Just tunings.

Robert Carr supported the tuning stories with an analysis of popular electronic tone-production methods, including additive synthesis, subtractive synthesis, FM, and sampling. Stanley Junglieb provided a sidebar about vector synthesis, and Carr added one about simple waveforms and understanding overtones and harmonics.

The November issue was by no means limited to discussions of tuning and synthesis methods. In the "Careers" section, Paul Lehrman (the current **EM** Web editor) offered advice about starting a music-software company, and Craig Anderton explained the ins and outs of freelancing in the musical-electronics business. The "MIDI" section featured Rick Schwartz's roundup of MIDI Thru boxes and switch boxes and offered several examples of how to configure your MIDI rig.

The "Circuit" section began with a Jack Orman story about building your own AC line filter. John Loffink followed with a DIY article about building a digital, voltage-controlled counter for syncing analog sequencers to other sequencers, drum machines, and so on.

The reviews section comprised two stories, both interesting. Tony Thomas took a close look at Yamaha's FB-01 FM synth module. Of special interest, in the wake of Alesis's recent problems, is Anderton's review of that company's seminal Midiverb and Midifex, which set a new price and performance standard for digital effects processors.

Overall, I consider the November 1986 issue one of the best published in **EM**'s first year as a monthly magazine. Almost every story is still relevant.

—Steve Oppenheimer

● LETTERS

right to print his opinion, but just because one article in a million isn't about male engineers, musicians, and producers, but about women, it's called *reverse sexism?*

I don't think reverse sexism is possible in the music industry! If Lowinger paid attention, he would notice that the majority of magazines cater to his gender. I never read the article he criticized ("Electric Ladyland," April 2001), but I have read millions of others, and seen millions of ads, that are geared toward males.

How do you think women feel when most magazines target males? For females, *sexism* is just another word in their daily vocabulary. I appreciate **EM**'s writing an article about women, and I wish I could have read it. Please don't take my opinions as some "angry woman thang." It just hurts to see women have such a hard time in the music industry.

I wish more people would recognize women engineers and give support to the younger generation. It's not just for the men. Thank you for listening and keep up the good work.

Ana Ierlick
via e-mail

Ana—You can check out "Electric Ladyland" at www.emusician.com. You also might enjoy reading "Breaking the Sound Barrier" (interviews with top female industry pros Lora Hirschberg, Rachel Portman, K. K. Proffitt, and DJ Rap) from the February 2001 issue, also available on our Web site.—Steve O

FUTURAMA

Steve O's "Front Page" in the August **EM** was worth the price of a year's subscription. I teach a course in goal setting and goal achieving; Steve O's suggestion about writing a short story showing the future as the goal setter would like it to be is a technique I plan to incorporate into my lesson plan. Two points are worth passing along.

First, luck is what happens when opportunity meets preparation. Second, by internalizing your goal or desire—making it so much a part of you that you can see it clearly, believe in it, and

LIBERATE your thinking

analog ears | digital minds

Pure analog sound—all of us at Universal Audio know there are times when there is no substitute for it. Our UA Classics such as the LA-2A, 1176LN and 2-610, reflect our passion for natural sounding audio that is true to the original, yet enhances the sound you hear. Our new M610 single channel pre-amp also reflects that passion with its all tube, high quality sound. With our analog legacy spanning back more than 40 years, it's easy to see that our digital minds understand the needs of today. Our new Powered Plug-Ins are the perfect example, because our analog ears are at the heart and soul of each and every one.

Our UAD-1 card, with its super-computer DSP chip technology, is what drives these Powered Plug-Ins. Adding a UAD-1 to your host-based digital audio workstation means you'll never have to sacrifice audio quality again. You're free to use the full power of your DAW without compromise—running Powered Plug-Ins with minimal impact to your CPU—to create your music without limitations.

the heartbeat of your music

UA Powered Plug-Ins take every nuance of our analog passion and deliver it digitally with exquisite effects like RealVerb Pro, and true-to-life emulation of our legendary LA-2A and 1176LN classic hardware—all running on our super-charged PCI card. Just one listen and you'll hear how Powered Plug-Ins will liberate your DAW, even better—liberate your ears, mind and music.

To find out more, visit an authorized UA dealer, www.uaudio.com, or call us at 831.466.3737.

To see and hear the new M610 and get a special first look at the newest Powered Plug-Ins, come to our booth 1366 at the 2001 AES Show Nov 30 - Dec 3 in New York, or check us out online for a virtual preview at: www.uaudio.com

UNIVERSAL AUDIO

© 2001 Universal Audio, Inc. All rights reserved worldwide. The Universal Audio logo, 1176LN, LA-2A, Powered Plug-Ins, UAD-1 and RealVerb are trademarks of Universal Audio, Inc. All other marks are property of their respective owners. All features, specifications, and other data subject to change without notice.

hold it dear—you create a powerful psychic energy field that will attract the people, circumstances, events, and opportunities needed to make your goal come true. The trick is to visualize your goal as if it has already been achieved.

Eric Beheim
via e-mail

NO, NOT RICHARD GERE

I have subscribed to **EM** since 1987. At that time, I used an Atari computer and Dr. T software. I have often wondered what happened to the good doctor. He disappeared from the scene, and nobody wrote about his fate. I later became a PC user and searched long and hard for software that contained some of the spirit of Dr. T's programs. Opcode's *Vision* was one program. Alas, Opcode disappeared before it could come out with an audio version of *Vision* for the PC (not to mention the program *Max*, which I waited many years for).

Now that I am due for a hardware upgrade again (my Pentium/150 MHz running Windows 95 is ready for the Museum of Computer Technology), I am looking at the question: Mac or PC? Also, with the advent of FireWire, I realize I could use a laptop to do everything I have dreamed of doing.

The Mark of the Unicorn 828 computer audio interface, for example, works with Macs and PCs. Recently I asked an expert what he would do; he said that a PowerBook G4/400 MHz was better suited to doing computer-based recording and digital signal processing (DSP) than the fastest, most powerful PC. He attributes that to the differences between Windows and the Mac OS. If that's true, why isn't someone at **EM** writing about it in clear terms? **EM** seems to avoid direct, unambiguous statements comparing the technical advantages of using one or the other platform (regardless of software) for computer-based recording and DSP.

Rob Waring
via e-mail

Rob—If that were true, as you say, you would have a good point—but it isn't necessarily true. Your expert is entitled to his views, but evaluating the relative advantages of the Mac and Windows operating systems for musicians is not that simple and unambiguous. I've heard bitter debates between "experts" on both sides of that argument, and I'm not convinced that one platform is superior for musicians.

Perhaps more important, some music software is available on only one platform, and you might feel that the advantages of your preferred applications outweigh the alleged technological disadvantages of the hardware and OS. Furthermore, some important differences are a matter of personal preference, not a matter of technology.

That said, we will certainly consider running a story that spells out the differences so you can draw your own conclusions.

Max *is now a product of Cycling '74 (www.cycling74.com), which is headed by David Zicarelli, the developer of Opcode's version of the software. Cycling '74 recently released* Max *4.0 for the Mac and expects to ship Windows and Mac OS X versions by the end of this year.—Steve O*

CAN'T GET ENOUGH OF EM?

emusician

ONLINE THIS MONTH:

- **Current issue contents**
  Get text files for every story.
- **EM article archives**
  Download the text of past features, columns, and reviews—for free!
- **EM links**
  emlinks The emlinks icon in various articles indicates that we have provided online audio or video examples for those stories. The example files will be posted on the first day of each month.

Visit us on the Web at www.emusician.com, the online home of *Electronic Musician.*

SERVICES FOR EM READERS:

- Free reader service! Our reader-service card is now online. Get the product information you need directly from manufacturers. It's quick and easy—no more mailing and waiting.
- You can subscribe to *Electronic Musician, Onstage,* and *Remix* or get help with your existing subscription.
- Want to work at **EM**? Check out our employment opportunities online.

TECHNICALLY SPEAKING

With all the product reviews **EM** publishes, it wouldn't be a bad idea to include technical-support reviews. That's a problem the reviewers probably never have to deal with, because when they test a unit, they probably have direct access to adequate support. But for those who have to walk the tough path, good technical support is almost as important as the machine or the software itself.

Richard Van Slyke
via e-mail

Richard—Throughout the years, the **EM** *editors have repeatedly discussed the best way to evaluate and write about tech support. You hit the nail on the head: the manufacturers know who the reviewers and editors are, so we are unlikely to experience the same support problems the average reader faces. Even if we were able to do an undercover investigation—dangerous ground for those who have no experience in such matters—we could not sustain it for long.*

That said, your point is valid, so the editors will discuss how we could meaningfully evaluate technical support. If you have specific suggestions, please feel free to write us again at emeditorial@primediabusiness.com.—Steve O.

ERROR LOG

September 2001, "Special Delivery," p. 84: The correct photo credit is Lorene Warwick.

WE WELCOME YOUR FEEDBACK.

Address correspondence and e-mail to "Letters," Electronic Musician, 6400 Hollis Street, Suite 12, Emeryville, CA 94608 or emeditorial@primediabusiness.com. Published letters may be edited for space and clarity.

WAVES New RESTORATION

Software bundle establishes a new standard for restoration and noise reduction.

Fast and incredibly simple to use, providing real-time feedback.

Ideal for music, post-production and forensic professionals.

X-NOISE

Intelligently learns from a section of noise and then applies broadband noise reduction.

X-CLICK

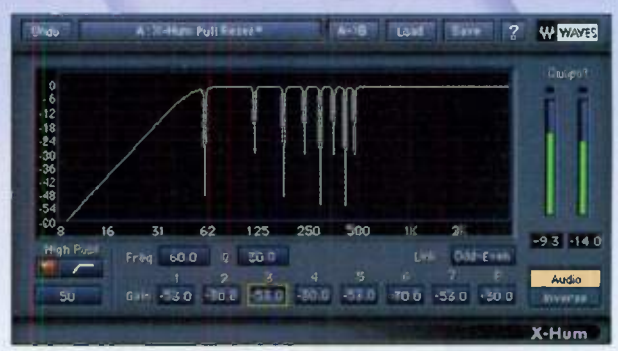
Effectively removes clicks from vinyl records as well as digital spikes.

X-CRACKLE

The 2nd stage in record restoration eliminates crackles and surface noise.

X-HUM

Removes ground loop hums, rumbles, microphone pops, and DC-offset.



See your WAVES dealer. Free 14-day demo at www.waves.com.

North and South America
Waves Inc., 306 West Depot Ave., Suite 100, Knoxville, TN 37917 USA, Tel: 1-865-546-6115, Fax: 1-865-546-8445
Rest of the world
Waves Ltd., Azrieli Center 1, Tel Aviv 67011, Israel, Tel: +972-3-608-1648, Fax: +972-3-608-1656

WAVES

Push the envelope. Move in a new

As an instrument it could not have existed until now.

As a control surface its language is 3 dimensional.

As a tool it is boundless.

Surface One is a completely unique virtual control surface that uses a fiber optic touch-sensitive material as its primary interface.

The user-configurable trigger objects can represent virtual faders, buttons, and knobs, and can be linked to multiple messages. All objects can be assigned to any MIDI commands.

Surface One introduces no latency to your MIDI messages, and is compatible with any MIDI-compatible software programs or hardware.

direction. Feel the future of technology.

SURFACE ONE™

Features include:

• 8 virtual pads, which can be subdivided into 5 individual triggers, offering a total of 40 objects • 11 virtual buttons • 16 knobs with 360 degree rotation • 2 in/2 out MIDI operation • USB compatiblity • Functions with and without a computer

midiman

800-969-6434 • WWW.MIDIMAN.NET/S1/EM • EMAIL: INFO@MIDIMAN.NET

USB MIDI

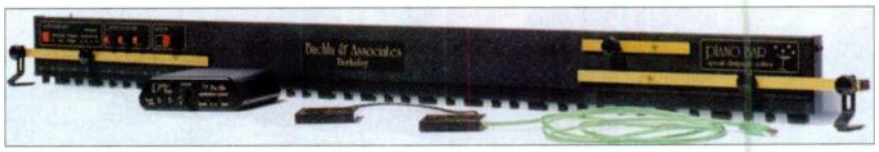
WHAT'S NEW

By Marty Cutler

PMI STUDIO PROJECTS C3

The Studio Projects C3 ($599) is a large-diaphragm condenser microphone from PMI Audio Group that offers a trio of polar patterns: cardioid, omnidirectional, and figure-8. The microphone has a dual 1-inch gold-sputtered Mylar capsule, and it requires 48V phantom power.

Applications for which the C3 is intended include choir overheads, vocals, pianos, stringed instruments, and drums. The microphone features a maximum sound pressure level (SPL) of 142 dB for 1 percent total harmonic distortion (THD). The C3 comes with a 10 dB pad switch in addition to a highpass filter that rolls off 6 dB per octave at 150 Hz. PMI Audio Group rates the frequency response of the microphone at 20 Hz to 20 kHz, and gives the signal-to-noise ratio as 76 dB. PMI Audio Group; tel. (877) 563-6335 or (310) 373-9129; e-mail info@pmaudio.com; Web www.studioprojectsusa.com.



BUCHLA & ASSOCIATES PIANO BAR

The Piano Bar ($2,350) from Buchla and Associates brings powerful MIDI implementation to acoustic pianos without the need for instrument modifications. The unit is quickly and easily installed; nothing touches the piano keys or interferes with the sound and feel of the piano, and you can adjust the Piano Bar to accommodate a variety of pianos and key spacings.

The Piano Bar's MIDI features include transposition, zones and layers, and support for MIDI Program Change and Bank Select commands. Assignable knobs on the front panel of the unit can send MIDI Control Change messages on any channel. For each piano key, the controller has LEDs that light up when MIDI messages are received. The Piano Bar gives you 25 presets and room for 100 user programs.

The Piano Bar's I/O box features a built-in, XG-compatible, 32-note polyphonic synthesizer with more than 500 instruments and drums. The rear panel sports a pair of RCA analog outputs, two stereo mini headphone outputs, and MIDI In and Out ports. The main unit has a ¼-inch expression-pedal jack. The Piano Bar also comes with a carrying case, a pair of pedal sensors, and the power supply. And yes, the bubbles in the front panel's stenciled champagne glass light up! Buchla and Associates; tel. (510) 528-4446; e-mail sales@buchla.com; Web www.buchla.com.

BOSS WP-20G

The WP-20G Wave Processor ($299) may look like just another guitar stompbox, but unlike traditional boxes, it employs the Composite Object Sound Modeling (COSM) technology of Roland's Virtual Guitar series processors. The WP-20G accepts 13-pin connectors from Roland GK-2 and other divided pickups to produce synthlike sounds. Settings include Saw Lead, Square, Sitar, Slow Gear, Ring Mod, and Acoustic. You can modify the timbre of a sound using the Color knob. Onboard effects, among them delay and chorus, provide additional sonic options.

Like the units in Roland's V-guitar series, the WP-20G requires no MIDI triggering, and tracking is immediate, accurate, and, above all, polyphonic. Jacks on the rear of the pedal provide an unbalanced ¼-inch output for the straight guitar sound, an unbalanced ¼-inch output for the processed guitar signal, an unbalanced ¼-inch effects return, and the requisite 13-pin input jack for connecting your instrument's divided pickup. A rear-mounted switch allows you to toggle the unprocessed signal on and off. If you use the WP-20G with the Roland GKP-4 parallel box ($145), you can simultaneously play as many as three additional devices that accept 13-pin cables, including MIDI guitar converters and other Roland V-guitar processors and amplifiers. Roland Corporation U.S.; tel. (323) 890-3700; Web www.rolandus.com.

Visit our Demo Room at www.emusician.com

You'll agree.

"The D1600 offers a good balance of straightforward operation and sophisticated capability."

"I suspect a lot of folks will see this machine as a luxury ride commanding a midsize price...give the D1600 a good look before you decide to spend more."
- Keyboard Magazine.

"The touch screen is quite wonderful; I could get around the unit fast...[The D1600] sounds great, is intelligently designed, and easy to use."

"...you can now produce truly pro-level recordings with a compact, budget-friendly box."
- EQ Magazine.

We think you'll agree. The D1600 Digital Recording Studio—all you need to record, mix and master your next CD.

D1600

- Recording Format: 24-bit/16-bit uncompressed, 44.1 kHz
- 8 track recording/16 track playback @16-bit mode
- 20 GB swappable internal IDE hard drive
- 100 scenes/4 locate points per song
- 3-band EQ per channel
- Four XLR inputs w/phantom power
- 24-bit A/D, D/A conversion
- 4 track recording/8 track playback @ 24-bit mode
- Optional internal 8x CDRW drive
- 24 channel, 8 bus digital mixer with scene memory and MIDI automation
- Up to 11 effects simultaneously
- 24-bit optical S/PDIF I/O
- Total of 128 tracks (8 virtual tracks per track)
- 106 effects algorithms
- 215 PCM drum rhythms
- Built-in tuner

Visit korg.com/d1600 for a demo.
Version 2.0 software and video manual now shipping and available online!

©2001 Korg USA. For more info via fax, call (631)390-6510 doc# 4196. www.korg.com

KORG

REV UP ▲▲▲▲

▲ ARTURIA

Cross-platform compatibility is not the only new feature in Arturia's *Storm* version 1.5 (Mac/Win, $199; upgrade from versions 1.0 and 1.1, free). The soft synth has improved performance and takes a smaller toll on the CPU.

Storm supports ASIO drivers and provides improved VST compatibility, and its redesigned user interface has a menu bar. *Storm*'s 20 software synth modules have redesigned filters. Arturia; tel. 33-43-802-0555; Web www.arturia.com.

SOUND QUEST

A MIDI and digital-audio programming environment for Windows computers, *Infinity* 2.0 (Win, $499; upgrade, $149) lets you build your own virtual synthesizers. It supports DirectX Instruments (DXi), VST, DirectX 8.0, and MFX.

Synths designed with *Infinity* offer Panel, Patch, and Tree views. Panel view displays the synth's user interface. All panel controls send native VST, MFX, or DXi automation events. Alternatively, the controls can send your MIDI messages to external devices to automate them.

Patch view shows the synth's architecture so you can design an instrument or processor. You can include knob, fader, switch, envelope generator (EG), and oscilloscope controls, and also customize your instruments using bitmapped skins.

In Tree view, the signal flow of your device is organized in folders. Clicking on the filter folder, for example, opens up the filter and its associated modulation routings in the Patch View window.

The package includes a large assortment of ready-to-use soft synths, organs, drum kits, and audio processors. You also get more than 140 macros for common synth and processor components, such as EGs, compressors, and mixers. *Infinity* 2.0 bundles the new *Infinity Player,* a standalone freeware program for using *Infinity*-authored synths and effects without a host program. *Infinity* 2.0 requires a Pentium II/200 MHz computer with 32 MB of RAM and Windows 95, 98, or ME. Windows NT 4.0 or 2000 users need 64 MB of RAM. Sound Quest Inc.; tel. (800) 667-3998 or (250) 478-4337; e-mail sales@squest.com; Web www.squest.com.

▲ DEFECTIVE SOFTWARE

Simultaneous playback of a VST Instrument and AIFF files or real-time audio input are among the new features in *VSTi Host* 3.0 (Mac, $35; upgrade from version 2.0, $10). The program supports ASIO-compliant hardware, allows you to record audio output to AIFF files, and lets you route audio in real time through four VST effects. The redesigned user interface features a virtual MIDI keyboard and online help.

VSTi Host 3.0 requires a PPC/604e/180 MHz, Mac OS 8.1, and enough RAM to run plug-ins. Running a sequencer host application will increase RAM requirements. Defective Software; e-mail dan@defectiverecords.com; Web www.defectiverecords.com.

IZ TECHNOLOGY

With the release of version 3.1 software, the Radar 24 hard-disk recorder can save files to UDF-formatted DVD-RAM media. You can choose Broadcast Wave or WAV file formats. The software is a free download from the iZ Technology Web site.

A Mac or Windows computer that is equipped with a DVD-RAM or DVD-ROM drive will let you drag and drop files authored on the Radar 24 into native digital-audio programs. The software upgrade includes support for Ethernet file transfers between Radar 24 units. iZ Technology; tel. (604) 430-5818; Web www.izcorp.com or www.recordingtheworld.com.

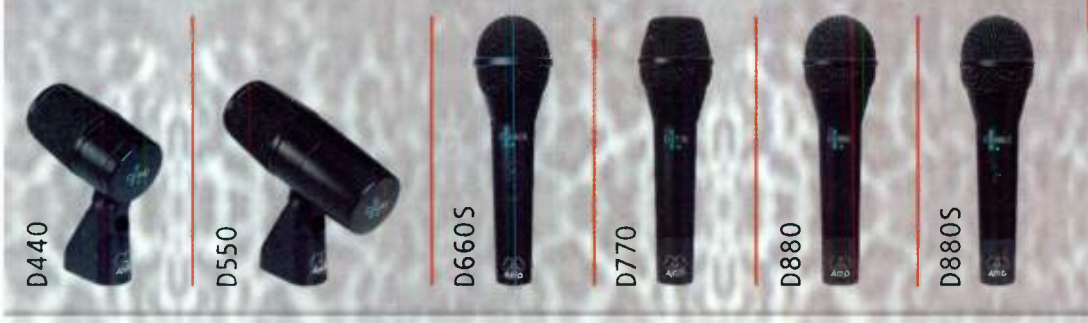
▼ BIAS

Version 3.0 of *Deck VST* (Mac, $399) adds support for VST plug-ins, ASIO drivers, and Tascam's US-428 for automated mixing. The program has an updated user interface and offers 64 simultaneous tracks of recording and playback and as many as 999 virtual tracks.

Deck VST 3.0 ships with more than 25 VST plug-ins. One, Waves *AudioTrack,* gives you parametric/graphic EQ and dynamics processing. Upgrading from *Deck* 2.7 is free; from OSC *Deck,* it's $199 and from Macromedia *Deck II,* $149. *Deck VST* 3.0 requires a PPC/604e/266 MHz, 32 MB of RAM, OS 8.0, *QuickTime* 3.0, and *Sound Manager* 3.2.1. BIAS; tel. (800) 775-BIAS or (707) 782-1866; e-mail sales@bias-inc.com; Web www.bias-inc.com.

Visit our Demo Room at www.emusician.com

AKG emotion series



$198 msrp $238 msrp $98 msrp $129 msrp $142 msrp $155 msrp

AKG

914 Airpark Center Dr. • Nashville, TN 37217 • Phone: 615-620-3800
Fax: 615-620-3875 • e-mail: akgusa@harman.com • akgusa.com

H A Harman International Company

SOUND ADVICE ▲▲▲▲

▲ DAN DEAN PRODUCTIONS

Every instrument included in *Dan Dean Solo Brass* ($649) is sampled chromatically. The ten-CD collection for GigaStudio offers as many as eight layers, recorded from *ppp* to *fff* for each note of every instrument. Dean recorded the samples in 24-bit, 44 kHz stereo and used Apogee's UV-22 bit-depth reduction system to convert sounds to 16-bit resolution.

Instruments included in the collection are bass trombone, cimbasso, euphonium, French horn, tuba, trumpet, and piccolo trumpet. Each instrument was recorded with and without vibrato. Ensemble presets take advantage of slight pitch and timbre variations between multiple samples to provide natural ensemble effects. Patches use Control Change messages to create realistic performances. For example, Modulation Wheel messages let you switch between staccato, portato, muted, and other sampled articulations. You also get presets that can switch articulations with MIDI Velocity. Dan Dean Productions; tel. (206) 232-6191; e-mail dandean@dandeanpro.com; Web www.dandeanpro.com.

KID NEPRO

Kid Nepro's *Millennium-3* ($150; CD-ROM or Zip disk) is a collection of sounds for Akai's MPC 2000 and 2000XL samplers. The sounds include kick and snare drums geared toward hip-hop, bell trees, basses, rock and funk guitars, wah-wah sounds, orchestra hits, band riffs, and drum beats.

The sound set also offers new samples that were created using the Korg Triton sample-playback engine in combination with Korg's MOSS physical-modeling board. Those include classic synth sounds, soundtrack-style pads, and vintage synth emulations. Kid Nepro; tel. (246) 420-4504; e-mail kidnepro@aol.com; Web www.kidnepro.com.

▼ NATIVE INSTRUMENTS

The *Tonewheel Set Vintage Collection* ($99) for Native Instruments *B4* offers four new tonewheel organ sets, enabling the software organ to go beyond B-3 emulations. The new sets model Vox Continental and Farfisa

Compact organs as well as an Indian harmonium. The fourth set lets you simulate aged or rejuvenated B-3 organs with conditions ranging from "clean" to "far beyond repair." In addition, the new virtual tonewheels let you tune *B4* to six different frequencies.

You get three versions of the Vox Continental: Soft, Hard, and Mix. The Farfisa Compact organs include versions with and without the Tone-Booster. You also get 24 new drawbar presets.

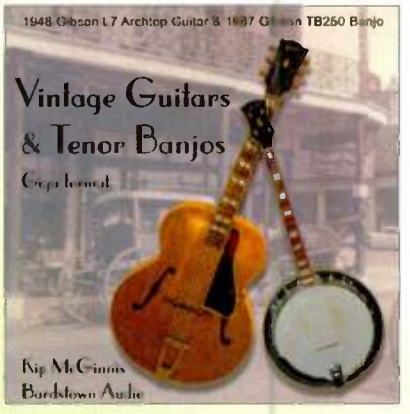
Despite the new tonewheel organs, the *B4*'s interface and functions remain the same. Consequently, you can process the new organs through the Rotary Speaker or the Tube-Amp modeling. You can also use the original drawbar presets with the new organs. Native Instruments; tel. (866) 556-6487; e-mail info@native-instruments.com; Web www.native-instruments.com.

▼ BARDSTOWN AUDIO

Bardstown Audio's *Vintage Guitars and Tenor Banjos* CD-ROM ($199; GigaSampler) offers samples made from a 1947 Gibson L7 guitar (recorded acoustically, with a pickup) and a 1967 Gibson TB-250 Mastertone tenor banjo. You get six instruments, divided between samples played with the thumb and others played with a pick.

Bardstown Audio sampled the electric archtop guitar through a DeArmond floating pickup to avoid pickup contact and interference with the natural vibrations of the guitar body. The pickup was mounted by the neck of the instrument to impart a warm tone. All the acoustic guitar and tenor banjo samples are stereo recordings.

Producer Kip McGinnis recorded the electric guitars through an Avalon M5 preamp into a Millennia TCL2 compressor with vintage Mullard tubes. Apogee converters provided the A/D conversion. McGinnis sampled acoustic instruments through a pair of Brüel and Kjaer 4012 cardioid condenser mics. Bardstown Audio; tel. (502) 349-1589; e-mail info@bardstownaudio.com; Web www.bardstownaudio.com.



Visit our Demo Room at www.emusician.com

2001: THE YEAR WE MADE CONTACT

INFINITY

Infinity 2.0 - *NOW SHIPPING!*

The complete sound design and multimedia control studio:
Create synthesizers, samplers and effects devices on your PC.

The Ultimate Plug-In

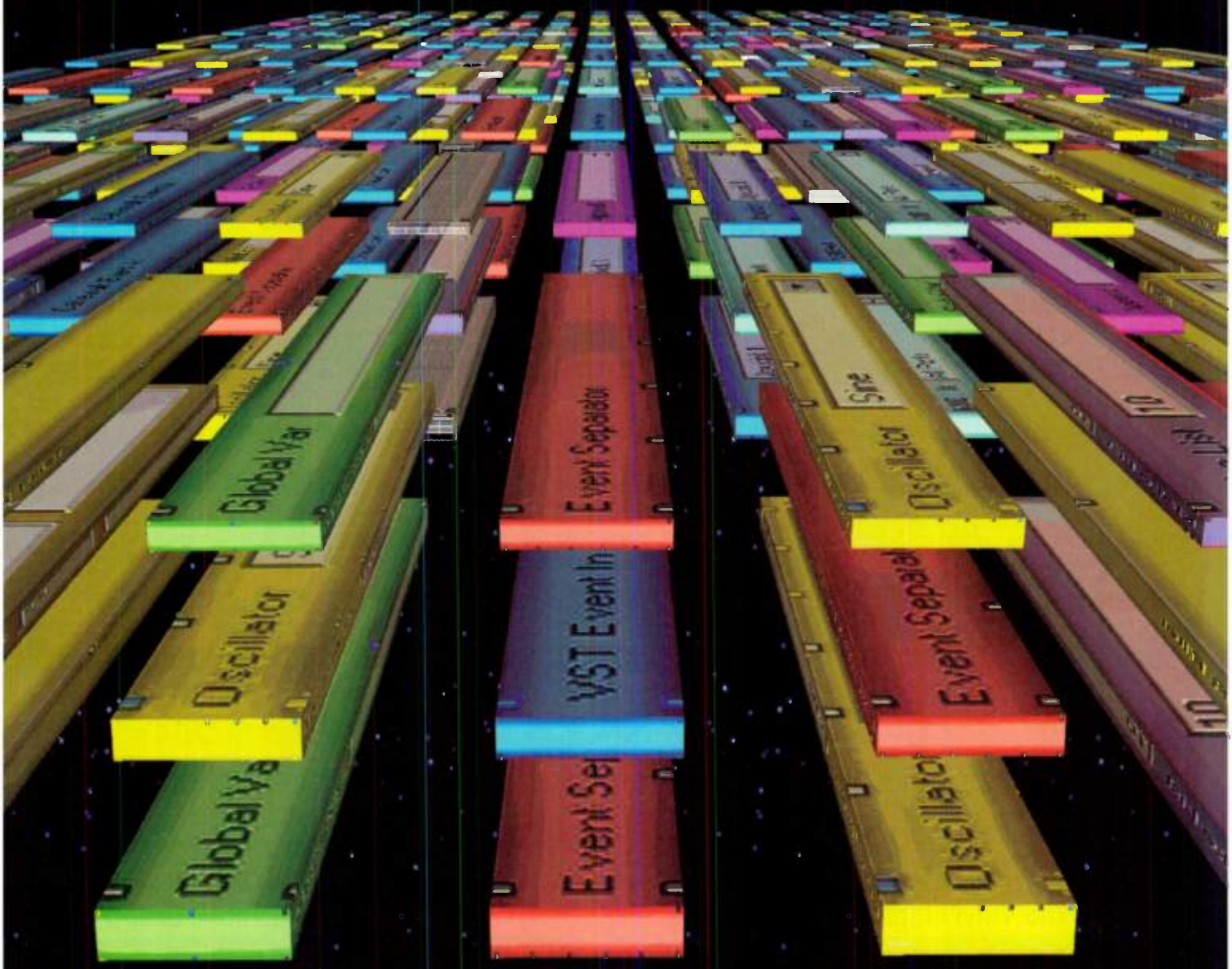
Plug your creations in anywhere:
Cakewalk MFX, DXi
Cubase VST, VSTi
& Direct X 8.0 compliant.

A vast module library

Over 350 objects performing MIDI, Synthesis, Digital Audio processing and many other functions: Lay them out and connect them in infinite ways to create the instruments of your dreams.

Full instrument library

Including an army of premade instruments ready to use right out of the box: Additive, subtractive and FM synths. Drum Kits, Samplers and Effects units. MIDI processors too!



Drop by your local dealer or visit our Web Site to download free demos and check out the latest news.

SOUND QUEST
MUSIC SOFTWARE

Sound Quest Music Software Inc. - 1140 Liberty Drive, Victoria, BC, V9C 4H9

www.squest.com

"When I need cutting edge sounds, I call EASTWEST or visit www.soundsonline.com" - Chris Kirkpatrick of *NSYNC

Downtown Beats

AUDIO

Looking the latest Nu Pop/Hip Hop/R&B beats that can be heard on record but not found on any current Sample CDs? Check out "Downtown Beats". It features the hottest and latest breaks ala Cherion Studios (Britney, N'Sync, Backstreet Boys) or Destiny's Child, or Outkast. the groove is right here. Beats, breakdowns, hits. Wicked beats all organized. (ID#2037)

Breakz From the Nu Skool

AUDIO-WAV/AKAI

Breakz From the Nu Skool is the first of two sample CD's in BT's signature collection and features cutting edge breakbeats hand mangled through hundreds of plug-ins, stomp boxes, pressed to vinyl, you name it! Best of all this CD is sample accurate! No more flaming as you stack loop upon loop. Once you've busted some Breakz From the Nu Skool, you won't look back!! (ID#2039)

Twisted Textures

2 AUDIO/AKAI

It²s time to unleash the power of art, spirit, and sound with BT's new sample CD, Twisted Textures - a massive two disc collection of sounds, pads, and waveforms, organized by emotion, that will lead you into all realms of the human condition and beyond. So no matter what project you are working on, Twisted Textures has a sound for you. (ID#2040)

Club Trackbuilders

2 AUDIO

Club Trackbuilders uses six producers from four different countries to create an unparalleled double cd of the latest breaks and samples of kicking club music. Construction kits in the 2-step, hard house, techno and drum&bass styles with plenty of extra breaks, loops and sounds (1200Mb+). A must have for dance/music producers working on the edge. (ID#2038)

Brutal Beats

2 AUDIO/1 WAV

Brand new from the producers of CHEMICAL BEATS! BRUTAL BEATS is a 3-CD set (2 CD audio plus WAV CD-ROM) loaded with aggressive 'John Bonham' style drum grooves. 'Straight' (mildly compressed) and 'Compressed' (pumping) mixes are provided, with up to TEN stages of digital and valve limiting/compression. Over 100 radically mutated dance remixes are included. (ID#2029)

Monster Beats

1 AUDIO/1 WAV

The mother of all powerful, driving, 'Kick you in the head' new generation loop CDs. Hard as rock natural born grooves with attitude from classic, untamed, British rhythm ace Chris Whitten. Real human feel but tight with mature, rich and organic sounds side by side with ground-breaking, jaw-dropping, leading edge production techniques. ZERO-G (ID#2012)

KLB Essential Trilogy

1 AUDIO/1 WAV (EA. VOL.)

Introducing Keith Le Blanc's Essential Trilogy, a 3 disc series (available separately, or get all three for the price of two). Vol.1 is "Hip Hop Hard Phat" where Keith lays down his freshest Hip Hop beats; Vol. 2 is "Old Skool Beats: Class of 2000", the beat gospel according to KLB; and Vol. 3 is "Out There", probably the weirdest drum collection ever produced! AMG (ID#2003)

Dance Mega Drum Kits

AUDIO/AKAI

This collection includes over 5000 Drum & Percussion samples assigned to 569 "ready-to-play" drum-kits for all dance-music styles... HipHop, RnB, new RnB, Rap, Soul, Funk, Live drum kits, Ballades, House, Disco, 2Step, Techno, Pop, Drum machines, 70's Kits, 80's Kits, Percussion Kits. A BONUS Akai/Emu CD-ROM is included for the price of an Audio CD (ID#2030)

QL Rare Instruments

3 CD-ROMS AKAI/GIGA

Rare Instruments (from QL Brass producer) features 16 ground-breaking, ethnic, multi-sampled instruments. "The result is jawdroppingly playable and gorgeous sounding ethnic instruments that will make you want to throw out your existing ethnic libraries and will inspire you to write music with an ethnic influence more often." - SONIC CONTROL (ID#2024)

Complete Celt 2

3 AUDIO

Complete Celt 2: Jigs, Reels & Polkas. Some of the finest Celtic musicians in the British Isles, including Riverdance's Luke Daniels, bring you a triple CD set of authentic, specially recorded licks and performances to add a Celtic influence to your tracks. Celtic Fiddle, Uillean Pipes, Mandolin, Bagpipes, Voice, Bodhran, Mandocello, Accordian etc. AMG (ID#2009)

XX-Large Pads 2

2 AUDIO/AKAI

XX-Large Pads 2 includes 800 new stereo pad-sounds, layers and single chord pads, orchestral strings, ambient and multimedia atmospheres, dance pads, film and FX layers... The best sounds of the latest synth generation were used. All Multi-samples are introduced with a small demo on the Audio CDs. All sounds are perfectly looped on the CD-ROM version. (ID#2036)

da nu R'n'B hip hop

2 AUDIO/ACID/PHRAZER

A unique variety of new RnB Hip Hop styles. 2 CDS packed with a whole bunch of flippn nu stuff from da East Coast. Twistin' construction kits, supablastin' beats, for all ya people out dere who dig da flava of Missy & Busta ... Dis one's a killa! All of the material is also excellent for commercials. Over 2 hours of content including extended song arrangements. (ID#1073)

The Vinyl Frontier 2

1 AUDIO/1 WAV

Simeon's back with a sequel to the hugely successful Vinyl Frontier covering completely new ground. This CD is much more up-tempo and features loops ideal for a wide range of modern dance styles - the heaviest lo-fi drums, from head-nodding hip-hop to ruffneck drum'n'bass, underground rhythms and raw soul breaks are all included. AMG (ID#2010)

Groovemasters Bass

2 CD AUDIO

2 CDs filled with High Quality Bass Grooves and multisamples using more than 8 different basses. A large selection of fixed tempo loops, played to the grooves from GrooveMasters Drums. so they work seamlessly together, giving you a super groovin' rhythm section. Also included is a huge selection of free tempo loops, to create the ultimate grooves . (ID#2021)

Quantum Leap Brass

5 CD-ROMS/7 FORMATS

"Quantum Leap Brass sounds great, and in one or two areas (notably the consistency of the attacks) raises the standard of professional sampling. That fact, combined with the overall quality, justifies giving it the Key Buy Award. The performances are first-rate, accurate, and well co-ordinated. The sounds are immaculately recorded throughout"- KEYBOARD

CALL 1-800-833-8339

EASTWEST

WWW.SOUNDSONLINE.COM

ENTER TO WIN $5,000 WORTH OF SAMPLE CDS ONLINE

XXL Club Edition 1

XXL Club Edition 1 from Best Service includes classic HIP HOP, classic R&B, and POP. 850 Drumloops and 350 additional sounds (60-120 bpm) are included in the collection. Chords, Synths, Hits, Basses, Guitars and Guitar licks, Brass Hits & Stabs, Effects, Pianos... All of the included drumloops are perfectly timed and sorted into bpm groups. BS (ID# 2031)

XXL Club Edition 2

XXL Club Edition 2 from Best Service includes new R&B, SOUL, and HIP HOP. 800 Drumloops and 400 additional sounds (60-120 bpm) are included in the collection. Chords, Synths, Hits, Basses, Guitars and Guitar licks, Effects, Organs, Pianos... All of the included drumloops are perfectly timed and sorted into bpm groups. Available in Audio and Akai. BS (ID# 2032)

XXL Club Edition 3

XXL Club Edition 3 from Best Service includes DISCO, HOUSE, DANCE, 70's and NEW FUNK. 1350 Drumloops and 350 other sounds (115-140 bpm) are included in the collection. Chords, Synths, Hits, Basses, Guitars and Guitar licks, Brass hits and stabs, Effects, Organs, Pianos... All of the included loops are perfectly timed and sorted in bpm groups. BS (ID# 2033)

XXL Club Edition 4

XXL Club Edition 4 from Best Service includes 2STEP, GARAGE, and FREESTYLE. 1300 Drumloops and 400 additional sounds (115-140 bpm) are included in the collection. Chords, Synths, Hits, Basses, Guitars and Guitar licks, Orchestral Effects, Organs, Pianos... All of the included loops are perfectly timed and sorted in bpm groups. BS (ID# 2034)

Skunkworks

NOW SHIPPING - STEELY DAN guitar maestro JEFF 'SKUNK' BAXTER delivers the ultimate guitar sample collection. The sounds are killer, the playing is impeccable, including super tight rhythm guitar grooves and soaring solos and guitar effects - but that's not all!! You get acoustic to heavy metal, and everything in between, there's simply nothing better! (ID#2023)

Techno Identity

Double mixed mode audio/akai collection (for the price a single audio CD) jam-packed with loops, lines, licks, fx, basses, rich single sounds, breaks, rolls, noize, tribal beatz, murder alarm fx, hooklines, alien vox, vinyl fx. Direct access to all drum samples in akai-format. All sounds are vinyl tested. You'll freak when you hear what this 2 CD set has to offer. (ID#2041)

8 Bit Stylez

Low tech sounds for high level music. fat! raw! incredible! C64-material remastered for all ya dance projects: nu rnb, hiphop, house, drum & bass, 2step, techno, chill'n tunes, jingles, www... power construction kits, overkill drumloops, sharp licks, game music & fx shots, machine vox, tons of single sounds... from the legendary C64-SID-chip. Attack the highscore! (ID#2042)

XSample Vols.10/11/12

Three new volumes in the 'super high quality' XSample series - Volume 10 Solostrings II: features Violin, and Violoncello (ID#2025); Volume 11 Solostrings III: features Viola and Double Bass(ID#2026); and Volume 12 Woodwinds II: features Clarinet, Bassetthorn and Bass Clarinet (ID#2027). Order all three volumes and save over 1/3 off the regular list price.

pro samples

Introducing the PROSAMPLES series, a combined effort from three of the World's most critically acclaimed Soundware developers, BEST SERVICE, EASTWEST, and ZERO-G, to bring you a series of high quality sample libraries, in six different formats in one package, to ensure that each PROSAMPLES volume is compatible with all of your sampling software and hardware - all for the unbelievable price of $49.95 for each volume! So why is this series so special? As many of you know, BEST SERVICE, EASTWEST, and ZERO-G have collectively dominated the Soundware industry for more than a decade. The PROSAMPLES series includes material from sample libraries that have already received over thirty international awards! During this time BEST SERVICE, EASTWEST, and ZERO-G have received more Keyboard KEY BUY AWARDS, Sound On Sound FIVE STAR AWARDS, Future Music PLATINUM AWARDS, and the highest ratings from Electronic Musician and other leading international magazines, than any other Soundware developer. The color coding above each title indicates which awards the titles, from which the ProSamples version was made, received (the review quotes also come from these titles). Each PROSAMPLES volume (with the exception of the multi-sampled instruments, which do not include ACID) includes the following formats: AUDIO, ACID, AIFF/MAC, AKAI S1000, EXS24 and WAV/PC for $49.95!

01-Hip Hop & RnB 1 (from Ill Jointz)
02-Hip Hop & RnB 2 (from Black Butta 2)
03-Drum & Bass 1 (from Drum'n'Bass)
04-Percussive Loops (from Percussive Adventures)
05-Pop & Rock Drumloops (from Steve Smith Drums)
06-Experimental Grooves & FX (from Asylum)
07-Future Beats 1 (from Chemical Beats)
08-World Vocals (from Deepest India)
09-Future Beats 2 (from Fields of Motion)
10-House (from Total House)
11-Classic Orchestra (from Advanced Orchestra)
12-Dance Vocals (from Voice Spectral 2)
13-Choirs (from Classical Choir/Hallelujah)
14-World Grooves (from Festa Latina)
15-Dance Drums (from Dance Mega Drums 2)
16-Guitar & Bass (from Quantum Leap Guitar & Bass)
17-Guitar Licks (from Jeff Baxter Skunkworks)
18-Steinway Grand Piano (from Ultimate Piano)
19-Pop Brass (from Quantum Leap Brass)
20-Orchestral Brass (from Quantum Leap Brass)
21-Drum & Bass 2 (from Total Drum & Bass)
22-Hip Hop (from NY Cutz)
23-Trip Hop (from Twisted City)
24-Breakbeat (from Planet of the Breaks)
25-Pop & Funk Brass (from Phantom Horns)
26-Nu RnB & Hip Hop (from Da Nu RnB HipHop)
27-Dancefloor Bass (from XXL Bass)
28-Vocal House (from Houseworx)
29-Dance Drumloops (from XX-Large)
30-World Instruments (from Ethno World)

ONLINE AUDIO DEMOS

Listen to online demos of these CDs at www.soundsonline.com. Insert the 4-digit ID# listed at the end of each product in the online home page search window.

▶ YAMAHA S03

The S03 ($629.95) from Yamaha is a 64-note polyphonic synth with a 61-note keyboard that offers over 700 sounds (including a batch taken from the S80 keyboard). The unit is 16-part multitimbral and is compatible with General MIDI and XG standards.

The synth's sample-playback engine features a wide assortment of pianos (including the S80's Stereo Grand), basses, solo and ensemble strings, pads, lead sounds, and drums. Patches are divided into an XG bank with 480 sounds and 20 drum kits, a preset bank with 128 patches, and a user bank with slots for 128 programs and drum kits. You also get 32 user-programmable Multi slots. A digital multi-effects section provides 11 reverb types, 11 chorus types, and 42 variation effects.

The Velocity-sensitive keyboard does not send Aftertouch. However, the synth responds to external Aftertouch messages. You get a master volume slider and wheels for Pitch Bend and modulation.

Yamaha bundles several software programs with the S03. *XGworks Lite* 3.0A (Mac/Win) is a MIDI and digital audio sequencer, *S03 Voice Editor* (Mac/Win) is an editor-librarian, and *TWE Wave Editor* (Mac/Win) is an editor for tweaking and importing digital audio into *XGworks Lite*.

Analog outputs are a left-and-right pair of unbalanced ¼-inch jacks. Two ¼-inch jacks are provided, one for a foot controller and one for a footswitch. MIDI connections are In, Out, and Thru ports and a Mini-DIN jack for connecting to a computer serial port. Yamaha Corporation of America; tel. (714) 522-9011; e-mail info@yamaha.com; Web www.yamaha.com or www.yamahasynth.com.

▶ CAKEWALK PLASMA

Cakewalk's *Plasma* (Win, $49.95) integrates MIDI and audio loop sequencing with software that caters to aspiring DJs and remix artists. The program supports DirectX Instruments (DXi), DirectX audio effects, Sonic Foundry's *Acid*-format WAV files, standard WAV and MP3 files, and joystick-controlled mixing.

Based on Cakewalk's *Sonar* MIDI and digital audio sequencer, *Plasma* gives you drag-and-drop audio looping and enables you to create as many audio and MIDI tracks as your computer's processor, hard drive, and RAM can handle. *Plasma* ships

with the *Plasma FXPad* plug-in, which lets you use a joystick or mouse for real-time control. Cakewalk bundles an *Acid*-format loop library and the *DreamStation* DXi software synthesizer to get you started. The package also includes *FruityLoops Express* for generating new *Acid*-format loops.

Plasma's minimum system requirements are a Pentium II/300 MHz with 64 MB of RAM and Windows 98, 2000, ME, 2000, or XP. Cakewalk; tel. (888) CAKEWALK or (617) 423-9004; e-mail sales@cakewalk.com; Web www.cakewalk.com.

▼ SAMSON S-COM 4

The S-com 4 from Samson ($279.99) is a 4-channel compressor/ limiter and expander/gate. You can use each channel independently or configure the unit as two stereo pairs.

The S-com 4 features an Automatic Envelope Generator, which automatically sets threshold and release times. The Smart Knee Detector automatically applies hard- or soft-knee compression. The expander/gate section offers a switchable release-time control. Every channel has an enhancer for restoring high frequencies dulled by heavy compression.

Each channel offers five-segment LED meters for monitoring I/O levels and gain reduction. Two-segment LEDs for each channel indicate when the gate is open or closed. Individual channel controls include knobs for expander/gate threshold, compressor threshold, and output level. You also get switches for gate release speed, enhancer on/off, and stereo-link for each channel.

The rear-panel sports balanced XLR and ¼-inch inputs and outputs for every channel. The unit also includes a switch for selecting –10 dBV or +4 dBu operation. Samson Technologies Corporation; tel. (800) 328-2882 or (516) 364-2244; e-mail sales@samsontech.com; Web www.samsontech.com. ❀

Visit our Demo Room at www.emusician.com

The Perfect Pro Tools® Companion: TASCAM MX-2424

If you have one of these...

...you need one of these.

MX-2424 24-TRACK 24-BIT HARD DISK RECORDER/EDITOR

Why is the **TASCAM MX-2424** the perfect companion to your Pro Tools or other DAW system? One word: *compatibility*. The MX-2424 offers your choice of two native audio file formats: Sound Designer II on Macintosh-formatted drives, and Broadcast Wave on PC formatted drives. These files support time stamping, giving you a fast, convenient way of transferring audio into your Pro Tools or other DAW system that supports time stamped audio files. Instead of spending hours aligning each track to its approximate original location, your recordings will be where they belong with sample accuracy.

Other reasons to get an MX-2424 for your Pro Tools rig? Since the MX-2424 records to SCSI drives, you can hot-swap them between systems without powering down your computer and recorder. You can record remote performances conveniently, leaving your computer in the studio. You can enjoy a familiar interface with the classic feel of a tape recorder. And perhaps most important, you can bet that the MX-2424 will satisfy your highest expectations in audio quality. If your editing/mixing system is based around Pro Tools or any other DAW, check out the ultimate companion piece – the MX-2424 – at your TASCAM dealer today.

*If you don't have a DAW system, **TASCAM's MX-View** waveform editing software runs in native Mac and Windows versions and connects via a fast 100Mb Ethernet interface. With MX-View, you get sophisticated, sample-level waveform editing, drag-and-drop editing on the fly, click and pop repair with the pencil tool, onscreen metering for up to six MX-2424s, editing across multiple machines, easy management of virtual tracks and much more.*

For all the details on the MX-2424 go to
www.mx2424.com

All copyrights are the property of their respective holders

TASCAM
a whole world of recording

WEB PAGE

By Gino Robair

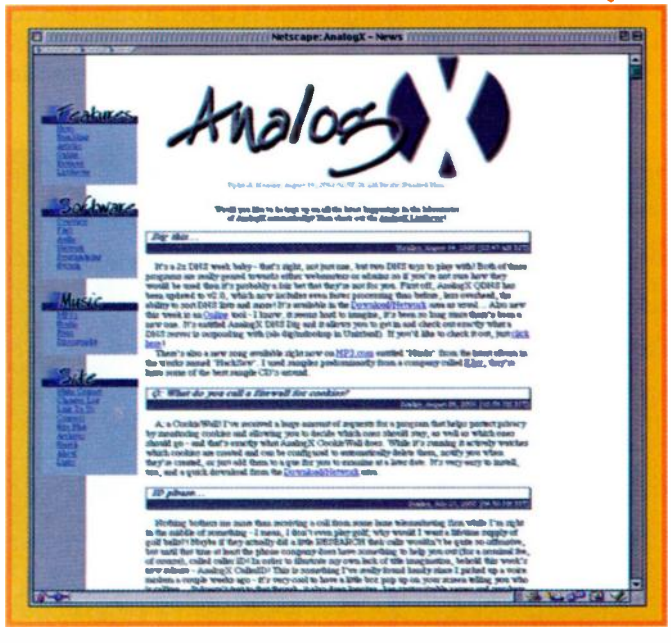
WEB SITE OF THE MONTH

One big question for any band maintaining a Web site is how to get return traffic. Typical methods include regular updates, photos, tour diaries, live recordings, and contests. But without the press muscle of a multinational corporation behind you, how do you substantially increase your e-mail list and drive new visitors to your site? AnalogX has an answer: offer freeware.

AnalogX (www.analogx.com) is a Web site, a band, and the Internet persona of songwriter and programmer Mark Thompson. The AnalogX site includes software utilities for programmers and musicians; movie, game, and music reviews; and, of course, music. The site is also completely free of banner advertising.

AnalogX has become so popular—it gets 12 million hits a month—that its creator was forced to hide his e-mail address deep within the site's pages. The AnalogX listserv has amassed 400,000 addresses in only three years.

Thompson has developed more than 70 simple-to-use software plug-ins and utilities for Windows, and normally, a new program is released each week on AnalogX. In the site's Audio category, for example, he has created a suite of ten DirectX plug-ins (including *DCOffset,* covered in the October 2000 "Web Page"), four WAVE utilities, three MIDI utilities, four utilities for the Ensoniq Paris system, and nine apps in the Misc Music Utilities category. Best of all, they're all freeware. "It's all free because it's hard to compete against free," Thompson says.



For Paris, Thompson created a program for automating its MiniMixer's controls using MIDI. More generalized applications include *Delay Calculator,* which calculates delays in milliseconds from tempo and bpm; *BitPolice,* which measures the resolution of DirectX audio plug-ins; and *Say It,* a speech synthesizer.

Thompson also created PrePal (www.prepal.com), which tracks trends in used-gear prices by automatically monitoring newsgroups and auction sites. PrePal includes prices for more than 2,000 products—including keyboards, microphones, monitor speakers, and recording equipment—from more than 100 manufacturers. Besides the product name, the site gives you the original list price, the average used price, the number of used sales that have been tracked by the system, and resale popularity. Updated frequently, PrePal accepts visitor suggestions and corrections.

DOTDOTDOT.COM

In the mid-'70s, the Odyssey, ARP's duophonic analog synthesizer, gave Moog's Minimoog a run for its money. With its 37-note keyboard and crisp sound, the Odyssey was a popular item on the road and in the studio and appeared on numerous recordings. During the eight years the synth was in production, three versions were produced, with incremental improvements enhancing each version. The **Ultimate ARP Odyssey Information Resource Page** (www.overacker.com/ody/index.html) is a great place to research the instrument's fine points. The site includes patches, schematics, modifications, history, and lists of parts, accessories, and technicians.... Speaking of ARP instruments, **Cirocco Music Systems** (CMS; www.cmssynth.com) provides service and upgrade packages for ARP 2000–series instruments. CMS recently revamped its Web site, which also features its line of high-quality analog synthesizer modules.... Visit Jim Martindale's **File Download Time Calculator** (http://www-sci.lib.uci.edu/HSG/AATimeCalc.html) before downloading a large file, whether you're using a 56 kbps modem or a T-1 line. Simply type in the size of the file you plan to download; the site will calculate the download time for 32 types

of connections, including various modems, fiber-optic connections, and wireless transmissions.

WEBCAST

Cool School Online (www.coolschoolonline.com) is an interactive, Web-based learning center that specializes in desktop audio. Developed by Cool Breeze Systems, creator of Cool School Interactus Training CD-ROMs, Cool School Online offers courses on the most popular sequencing and editing systems as well as diverse recording topics.

The lessons include text, pictures, sounds, streaming QuickTime movies, interactive examples, and links to related Web pages. After each section of a course, you can take a multiple-choice quiz; at the end, you can test yourself with a final exam.

Recent offerings include DAWs 101, an overview of the concepts behind digital audio workstations; DA Storage Basics, which covers topics related to digital-audio storage, including archival tips, and FireWire and SCSI technology; Sessions, a series of courses covering recording sessions from start to finish; and introductory courses on Mark of the Unicorn's (MOTU's) *Digital Performer,* Emagic's *Logic Audio,* and Digidesign's Pro Tools.

Students who sign up with Cool School Online can post messages to course-related message boards, use the online glossary, and chat with other students or the instructor. Each course or movie library costs $49.95: you have access to courses for 30 days and movie libraries for ten hours a month for one year after purchase. Minimum system requirements are a 56 kbps connection, Netscape *Navigator* 4.0 or Microsoft *Explorer* 5.0, *QuickTime* 3.0, and *Shockwave* 7.0.3.

DOWNLOAD OF THE MONTH

Are you looking for a browser that takes up little space and is quick on the draw? Based in Oslo, Norway, Opera Software offers *Opera* (www.opera.com), "the world's fastest Internet browser," according to the company. At 2 MB, it's relatively small compared with mainstream browsers. In addition, *Opera* adheres to HTML standards much more rigorously than other browsers, which means the program can shed light on sloppy Web-page design.

Opera is available for the following computer platforms: Windows, BeOS, EPOC, and Linux/Solaris. *Opera* is also available in beta versions for OS/2 and Mac OS 7.5.3 through 9.1, and in a preview form for Mac OS X. The freeware versions of *Opera* for Windows force you to deal with banner ads, which slow the program's performance. However, for $39 you can get the ad-free version and take advantage of the speed for which *Opera* is becoming known.

The latest version of *Opera* for Windows, version 5.12, includes Java and XML support and is available in 13 languages, including German, Italian, French, Icelandic, Afrikaans, and Russian (with support for Cyrillic characters). Also in the works are editions in four Celtic languages—Breton, Irish, Scottish Gaelic, and Welsh.

After downloading *Opera,* check out *Opera Composer. Opera Composer* lets you create a customized browser, so you can design a startup screen, add images to the buttons and toolbar, and design a new skin.

BAND ON THE WEB

Some bands have all the luck: Wetwerks (www.wetwerks.com) formed in 1998 after guitarist and vocalist Seth Warden and drummer Rob Parzek submitted a demo to a local modern-rock station's Next Big Thing contest. The demo won them a performance slot opening for Blink-182 and Everclear at a station-sponsored festival. To do the gig and to fill out the band, Warden and Parzek enlisted college chum Nate Giordano on bass, and the trio quickly wrote a set's worth of material. Since then, Wetwerks has continued to develop its blend of funky grooves; heavy, riff-laden chording; and rap-inspired vocals.

The band's eponymous debut showcases Warden's solid vocal presence. It was recorded in Parzek's personal studio in upstate New York, using an Ensoniq Paris digital audio workstation (DAW). The production is texturally rich and lends a major-label quality to the release. For example, the drum tracks combine samples of acoustic and electronic instruments with sequences and loops. Because of space limitations, the drum parts were tracked using Roland V-drums, and the guitars were recorded using amps and the Line 6 Pod. "The vocals were tracked in the bedroom using dirty laundry as sound-dampening material," Parzek says.

To get the visibility it needs, Wetwerks put together an impressive Web site. It includes a number of fan-oriented items such as band-member bios, an automated e-mail list, a message board, concert announcements, and concert and studio photos. All of the album's songs are available in RealAudio and MP3 formats on the Tunes page. If you like what you hear, follow a link to Fulfill-net (www.fulfill-net.net), where you can purchase the CD and other merchandise, securely, online. A clever addition to the site is a specialized Wetwerks.com skin for the *Winamp* player, which you can use while listening to the band's MP3s.

"Our site not only lets people buy our disc, but it's also an image enhancer," Parzek says. "The Web is the place where we can create a mood. It can provide current information about the band and deliver content to people everywhere, which gives us constant exposure."

WEB APP

What could be more exciting to a composer looking to push the envelope than a universally accepted, platform-independent language combined with a powerful software "toolbox" for creating music? With the help of interactive-music software developer Phil Burk, composer and software designer Nick Didkovsky (aka Dr. Nerve) has united Hierarchical Music Specification Language (HMSL) and Java to form Java Music Specification Language (JMSL), an application that can be used to create Java-based algorithmic and interactive pieces for the Web and standalone environments.

HMSL is a Forth-based, object-oriented programming language developed in the 1980s at the Mills College Center for Contemporary Music, in Oakland, California, by Burk and composers Larry Polansky and David Rosenboom. In 1997 Didkovsky began porting HMSL into Java. After some initial experiments, Didkovsky and Burk collaborated to completely rewrite HMSL using Java, and JMSL was born.

JMSL combines the hierarchical scheduling capabilities of HMSL with the many Java-development resources that are available. The combination gives composers a variety of tools, such as distribution functions and sequence generators. Composers can even use JMSL to schedule nonmusical events over time.

Built into JMSL is *JScore,* a programmable, extensible music-notation editor that has algorithmic features. "Because much of the computer music I write is traditionally notated for live performers, I needed something that would be a step up from the suite of interconnected HMSL composition tools and off-the-shelf notation tools I rolled together on the Amiga computer," Didkovsky says. "*JScore* has gone way beyond that. You can add custom music transformation classes directly into the *JScore* menu bar with one line of code. I have mutation transforms in there, a hocket transform, melody scramblers, and a retrograde transform. The user can program custom transforms and add them in. *JScore* transcribes complex algorithmically generated music as well, so you can convert abstract algorithms to common music notation. *JScore* is like a music-notation editor on steroids."

Additional application programming interfaces (APIs) supported by JMSL include Sun Microsystems' JavaSound (see "Web Page," May 2001), Burk's JSyn (see "Web Page," June 2000), and Grame's MidiShare. Each of those APIs can be used in a Web site in such a way that they are transparent to the user. For more information, visit www.algomusic.com.

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

Best Prices. Largest Selection. Amazing Service.

Sweetwater
music technology direct

Get the gear you want. Get it now!

If you only shop at your local music store, you're missing out on a lot!

Sweetwater offers you

- The BEST prices!
- The LARGEST variety of top brands in stock and ready to ship!
- FREE lifetime service and tech support by the industry's leading music specialists!
- Hassle-free shopping!

Make the smart choice for your music. Buy direct from Sweetwater today!

Call Now and Save!

Our toll-free number:
1-800-222-4700
— or —
Visit our website:
sweetwater.com

Experienced and Knowledgeable Salespeople

Factory-authorized service center

FREE LIFETIME Technical Support

Sweetwater
music technology direct

Experience the Sweetwater Difference Today!
1-800-222-4700

©2001 Sweetwater, Inc.

335 Bass Road • Fort Wayne, IN 46808
Tel: (219) 432-8176 • Fax: (219) 432-1758
http://www.sweetwater.com

MANLEY KORG KURZWEIL Steinberg E-MU HAMMOND
GLYPH AKAI YAMAHA ALESIS MACKIE. Takamine Roland digidesign
BBE MOTU BOSS PRS

By Julian Colbeck

Roland MC-202 MicroComposer

Produced: 1983–85
Made in: Japan
Designed by: Roland product design team
Number produced: 4,000
Synthesis system: Subtractive analog
Price new: $595

Today's prices:		
	Like new	*$450*
	Like, it's okay for its age	*$400*
	Like hell	*$375*

Long before Roland reinvented itself as a purveyor of DJ-friendly groove gear, the MC-202 was the original groove box. Despite being almost 20 years older than the Roland MC-303 and MC-505, the MC-202 fits snugly into the hip, knobby, bass-heavy world of dance music.

Introduced in 1983—the same year as the first MIDI instruments—the MC-202 lacked MIDI capabilities. You could scarcely give one away. Roland Corporation's chairman Ikutaro Kakehashi once told me it was the company's worst-selling keyboard product. That may be an exaggeration; now Roland says the fabled TB-303 sold even fewer.

The "MC" in MC-202 stands for MicroComposer, which is Roland's fancy name for a sequencer. The MicroComposer has been a Roland specialty since the MC-8 and MC-4 were unveiled in 1978. As an all-in-one sequencer and sound source, the MC-202 is a direct descendent of the MC-4 and Roland's SH-101 monophonic synthesizer. It was designed to be a host for the SH-101, the TR-606 Drumatix drum machine, and the TB-303 Bassline. If only Roland's marketing department had thought to call the MC-202 a workstation, or even a "walkstation" (you can run it on six C batteries and monitor it with headphones), its sales might have turned out differently.

The MC-202 is small but chunky with a 32-pad keyboard for entering notes rather than playing, an LCD (a rarity at the time), and sliders and buttons for controlling the synth section. Saying that the MC-202 is reminiscent of the SH-101 puts it mildly; aside from the absence of a noise generator and a slight reworking of the low-frequency oscillator (LFO; fewer waveforms, but with a delay parameter), the sound engine *is* an SH-101.

Like the SH-101, the MC-202's design features an oscillator and a suboscillator; nonetheless, you can build up a fairly substantial sound because the pulse wave, sawtooth wave, and suboscillator have volume-control sliders. Pulse width can be set manually or modulated by the LFO or the ADSR envelope generator (EG). The LFO, which generates a sine wave, has simple rate and delay controls. The resonant 24 dB–per–octave lowpass filter can be modulated by the LFO or EG, but it must conform to the amplifier's EG unless the amp is in its Gate position. A free-flowing slider controls keyboard tracking.

Understandably, the MC-202 specializes in bass and lead synth sounds. From thick, rich pulse-wave spreads to precision sawtooth sounds spiked with resonance, the MC-202 belies its size and price when it comes to low-end power.

Even with the ahead-of-its-time LCD of notes and Gate times, the MC-202 is hardly user-friendly. You can store sequences internally if batteries are installed, but for permanent storage, you should offload data to cassette tape; a jack is provided for that purpose.

The MC-202's sequencer can store 2,600 notes on two tracks. Input methods are quirky by modern standards. In real time, you play along with the metronome using the little keyboard pads, but that isn't as easy as it sounds.

DANIELE MARZIALI

A total failure in its day, the MC-202 has become a mainstay of the Roland vintage-gear scene. It may not rival the TB-303 and SH-101 in popularity, but it comes close. Because so few were made, it's also rather rare.

What is finer than Gold?

You can also enter data in "tap" mode, tapping in the notes first and the rhythm afterward, or use step-time input, complete with dotted rhythms and rests. You can add expression with Portamento and Accent; Accent controls the filter cutoff or the amplifier level. With enough practice, an expert user can enter just about any monophonic line, style, or rhythm into the MC-202's sequencer.

Its dual-channel sequencer is configured to trigger the internal sound on one track and an external sound source—such as the SH-101, the TB-303, or even another MC-202—on the other using the Control Voltage (CV) and Gate jacks. Both tracks can control external instruments, but only one can trigger the internal synth engine.

Theoretically, the MC-202 is equipped for the outside world. It can sync up a host of rhythm-based instruments, including the TR-606 and TB-303, and its sequencer can control almost any synth that has 1V-per-octave CV and Gate inputs. The MC-202's CV and Gate outputs are not completely satisfactory in speed and range, though, because an incoming signal lags unacceptably as it journeys through the internal circuitry before triggering a note.

However, DIN Sync (aka Sync24) is available and provides more reliable results. You can sync the MC-202 to MIDI if you have a MIDI converter that features DIN Sync. Some users have successfully experimented with synchronization using FSK sync straight into the MC-202's Tape Sync In jack, which fools the MC-202 into thinking it's receiving the data from tape.

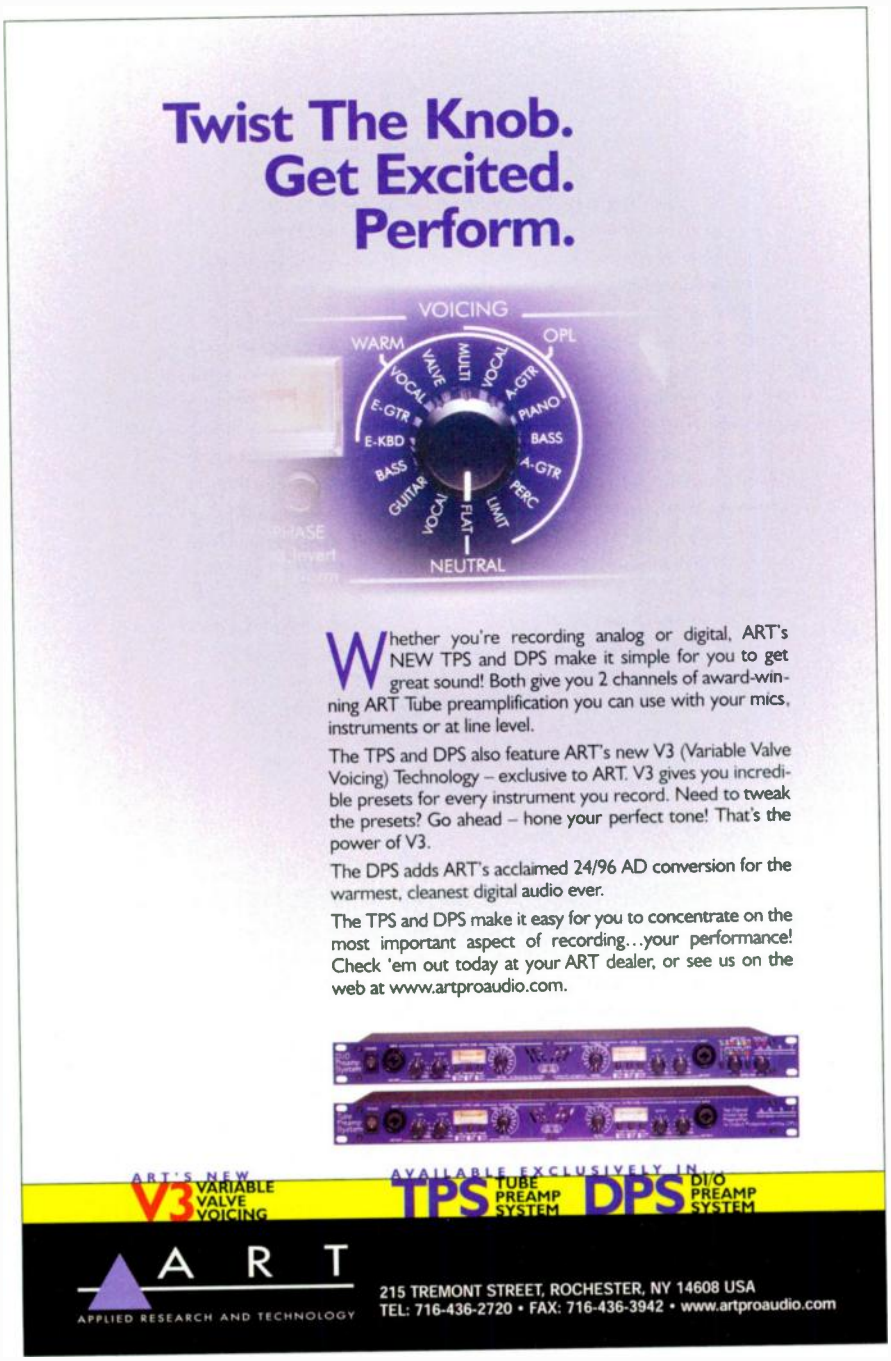
A small subculture of modifications, and even a few computer applications, have sprung up for the MC-202; one of the more fascinating is *202 Hack*, a shareware Java application that converts Standard MIDI Files into MC-202 sequence data. You can purchase the application from Defective Records (www.defectiverecords.com), the dance-music label co-owned by *202 Hack*'s author, Dan Nigrin.

Although the MC-202 is now a sought-after throwback, it has not attained the status of the Roland TB-303, and it probably never will. When you compare both instruments sound for sound, though, it's a close call. Current prices, which are generally less than half of those for a TB-303, make the MC-202 a comparative bargain.

Julian Colbeck *has toured everywhere from Tokyo to São Paulo with artists as varied as Yes, Steve Hackett, John Miles, and Charlie.*

PRICE GUIDE

The quoted prices reflect typical street prices you must expect to pay in U.S. dollars. The buy-in on vintage instruments, as with vintage cars, is just the beginning, though. Most of the original manufacturers are long gone, so maintenance and repairs are expensive.



We welcome your feedback. E-mail us at emeditorial@primedia.com.

Our Holiday Special.

This is luxury! The best value music production software and the most successful software sampler, together in one package. This is fun! Creative freedom combined with technical perfection. This is the deal! Purchase the Gold EXS Edition before 31st December 2001 and save over 40% on the combined price of Logic Gold and EXS24. A special holiday offer, only at your specialist Emagic dealer. Only while stocks last.

>> Realtime MIDI and audio arranging and editing
>> Freely configurable user interface
>> Professional realtime notation, with layout + printout
>> Up to 64 stereo audio tracks with dual hardware support
>> 32 Bit internal signal processing
>> Compatible with ASIO, EASI, Direct I/O, and many more
>> Digital mixer, 4 band EQ, 8 inserts and 8 busses
>> Full automation of effects, mixer and more
>> 35 high quality Emagic effect plug-ins
>> Supports VST, VST2, DirectX, and more formats
>> Practically unlimited amount of MIDI tracks
>> Environment for comprehensive MIDI control
>> Up to 24 virtual samplers, each with 64 voices
>> Sample accurate playback timing
>> Compatible with AKAI, Soundfont2, SampleCell
>> Compatible with WAV, AIFF and SDII
>> Supports up to 24 Bit / 96 kHz samples
>> Powerful low-pass filter with Fatness control
>> 2 ADSR envelopes and 2 LFOs
>> Modulatable sample start point
>> Pitch envelope or glide

Technology with Soul.

www.emagic.de

THE NEWEST TECHNOLOGY!
THE HOTTEST DEALS IN THE U.S.A.!

ZOOM MRS-1044 $699.99 List: $1199.00

AVALON DESIGN **VT-747-SP Call!**

JBL LSR-25P $499.99 A Pair

Tannoy System 600 $1199.99 A Pair

Yamaha AW-2816CD $1999.99 List: $22399.00

SAMSON S-Com Plus $179.99

SAMSON S-Phone $169.99

Tannoy Reveal Active $779.99 A Pair

Korg D1600 $1599.99 List: $2000.00

MPX-100 $199.99

t.c. electronic **Finalizer Express** $999.99

Roland DS50A $499.99 A Pair

Korg D-12 $899.99 List: $1150.00

Event PS-5 $469.99 A Pair

RFX-2000 $199.99

Roland VS-1880 $1499.99 List: $2795.00

Bluetube $159.99

TC Works **Powercore** • $1099.99
Universal Audio **Powered Plug-ins™** • $799.99
Emagic **EMI 2/6 USB Audio i/o** • $349.99
M-Audio **Omni Studio** • $379.99

BOSS BR-532 $395.99 List: $495.00

A R T

Tube MP-Studio $109.99

DIGITAL RECORDING
SIGNAL PROCESSING, GROOVE BOXES

Roland VS-2480 CALL For Lowest Price!

Allen & Heath Mix Wiz DX $999.99 List: $1195.00

Fostex VF-16 $999.99 List: $1399.99

Mackie Digital 8-Bus CALL For Lowest Price!

Mackie HDR2496 $1999.99 List: $4999.00

Alesis HD24 $1999.99 List: $2499.00

Roland VSR-880 $499.99 List: $1795.00

Roland

Tascam DM24 CALL For Lowest Price!

TASCAM

Visit our website for the best deals in
Guitars • Drums • Live Sound • Books & Video

1·800·4·SAMASH
www.samash.com

SYNTHS, DIGITAL PIANOS, SAMPLERS, CD RECORDERS
YAMAHA
Yamaha YP-80 999.99 List: $1295.00
Roland FANTOM CALL! For Lowest Price!
NEW!
Roland RD-700 CALL! For Lowest Price!
Roland
Korg Karma $1799.99 List: $2255.00
FREE BONUS!
KORG
Tascam CD-RW4U $459.99 List: $579.00
TASCAM
Pioneer CDJ-1000 $1149.99 List: $1299.00
Pioneer
Neumann TLM-103 $659.99 List: $895.00
Marshall MXLV-67G $219.99 List: $279.99
AKG
AKG C-1000S $199.99 List: $288.99
Roland RD-2 Groove Box $495.99 List: $595.00
Korg MS2000R $699.99 List: $850.00
Korg Electribe•M $399.99 List: $499.00
Akai MPC-2000XL $1499.99 List: $1649.00
AKAI
Zoom ZRT-123 $169.99 List: $299.00
Roland CDX-1 DiscLab $1299.99 List: $1495.00
YAMAHA
Yamaha RS-7000 CALL! For Lowest Price!
nord lead 2
Nord Lead 2 Sound Module 999.99 List: $1399.00
Denon DP-DJ151 299.99 List: $599.00
DENON
Digital Output!
Korg Triton Rack 1599.99 List: $2500.00
HHB CDR-830 $549.99 List: $795.00
ALESIS
Alesis MasterLink $999.99 List: $1695.00
SONY
LOWEST PRICE EVER!
Sony CDR-W33 $469.99 List: $699.00
DENON
Denon C550R $699.99 List: $850.00
Shure KSM44SL $699.99 List: $1393.60
SHURE
Stageworks LD3 $129.99 List: $299.99
Stageworks
Audio Technica AT4035 $199.99 List: $349.99
audio-technica
CAD M-177 $169.99 List: $289.00
RED HOT DEAL!
NO PAYMENTS! INTEREST! FOR 12 MONTHS ON ANY ON-LINE PURCHASE!*
want a FREE catalog?
Call 1-800-4-SAMASH or log on to www.samash.com
We Will Beat Any Price!
LOWEST PRICE GUARANTEED!
50 STATES/60 DAYS
FREE SAME DAY Shipping on most orders over $100!**
OPEN 24 hours 7 days
Be sure to enter our on-line contest to win great gear!
Mention Code EM3DP When Ordering!
samash.com
The on-line musical instrument megastore!
1·800·4·SAMASH • www.samash.com
Samash.com is part of the Sam Ash family of companies, including 30 musical instrument megastores nationwide.
*On your Sam Ash credit card, subject to credit approval. If balance on these purchases is paid in full before the expiration of the 12 months promotional period and your Account is kept current, accrued Finance Charges will not be imposed on these purchases. If balance on these purchases is not paid in full, Finance Charges will be assessed from the purchase date at the Standard Rate of 20.96% APR. For Accounts not kept current, the Default Rate of 24.96% APR will be applied to all balances on your Account. Minimum Finance Charge $1.00. Offer expires 12/31/2001.
**Applies to orders shipped in the contiguous United States. Items that require special shipping due to size or weight are excluded from this offer. See our website, www.samash.com, for complete details. Offer expires 12/31/2001.

PROFILE

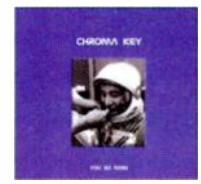
By Matt Gallagher

The Final Frontier

Kevin Moore was the original keyboardist in the progressive-rock band Dream Theater before embarking on a solo career as Chroma Key. "I quit the band because I wasn't getting off on that kind of music anymore," he says. "I'd been doing another kind of writing that was more mood oriented. I started to write in what ended up being Chroma Key style."

A haunting, cinematic work in the vein of Pink Floyd and Brian Eno, Chroma Key's *You Go Now* was coproduced by Moore and sound designer Steve Tushar. Moore's vocals and spoken-word samples from obscure vinyl records hover over lush, expansive washes of synthesizers, piano, guitar, bass, and sampled drums and percussion. "I love soundtrack albums," Moore says. "An approach I take with my music is to leave open a lot of space and have a continuous mood throughout the album, as opposed to a big variety of music."

In Chroma Key's music, space is the means as well as the destination.



A rented space in Los Angeles's Chinatown was Chroma Key's recording studio. "We were right next to the on-ramp of a freeway," Tushar says. "Getting the greatest sound is not essential. You need some lo-fi and some hi-fi. You can pretty much make anything work and record it anywhere as long as you have a good preamp," he says, adding that they recorded everything through a pair of Neve mic preamps.

The duo tracked *You Go Now* on a Pentium II/450 MHz PC built by Tushar running Steinberg's *Cubase* and beta versions of *Nuendo*. Their studio included a Soundcraft Digital 328 mixer, Mark of the Unicorn (MOTU) 2408 hard-disk recording system, and MOTU MIDI Express MIDI patch bay. Moore and Tushar miked vocals with an AKG C 414 and used a Shure SM57 on guitarist David Iscove's amp. Their outboard processors consisted of the Alesis MidiVerb II, Alesis QuadraVerb 2, Ensoniq DP/4, and an FMR Audio RNC1773 compressor. They mixed all but one track to a Panasonic SV-3700 DAT machine.

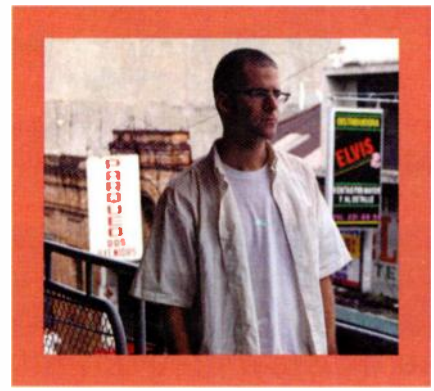
Chroma Key's writing process was collaborative. "I would show Steve some piano ideas, and he would come up with loops—or I'd do that—and then we would work from there just layering stuff, usually in [Sonic Foundry's] *Acid*," Moore says. "Then everything would end up in *Cubase* or *Nuendo*." Tushar spiced up audio tracks, often mangling Moore's Yamaha CP-70 electric-piano parts, with his collection of software plug-ins, including Waves' Native Power Pack bundle, Sonic Timeworks' *Phazer*, and Waldorf's *D-Pole*.

Four synthesizers appear on *You Go Now:* the Access Virus, Kurzweil K2000, Moog Memorymoog Plus, and Nord Rack. Moore enjoyed featuring the Virus's vocoder, and Tushar chose the K2000 for shaping drum sounds. "Plug-ins can't emulate lowpass resonant filters or distortion," Tushar says, "so I'd still go back to my K2000 for that."

Several vocal samples are from an album of radio transmissions from Apollo space missions. "The NASA stuff was just an LP I picked up in a used record store—highlights of the moon landings," Moore says. "A lot of it was just, 'Well, the crew is sleeping right now,' and it seemed to be mundane information for this really extraordinary experience. 'Astronaut Down' was inspired by that.

"My idea for the album was completely different from what it ended up being," he says. "I was planning on it being more acoustic, like the late Talk Talk stuff. We got into this groove, and I liked the way the songs were coming out, so the whole album ended up being electronic. I can't really plan what albums are going to be like. They just take over and do what they want to do. The songwriting is sort of mixed up with recording for me." ❦

For more information, contact Fight Evil Records; tel. (603) 962-8442; e-mail fight@chromakey.com; Web www.chromakey.com.



PATRICK MOORE

You Go Now/Chroma Key

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

You love your guitar!
She loves you back!

A sound relationship seeks perfection.

Perfection?

G•MAJOR
GUITAR PROCESSOR

The affordable TC Electronic Multi-Effects Processor for the accomplished guitarist that runs no less than seven different high quality effects and a tuner simultaneously.

G•MINOR
MIDI FOOTSWITCH

(Optional)

The G•Minor triple MIDI footswitch gives immediate access to the most fundamental functions of the G•Major such as Program changes, Tap tempo, Tuning on-the-fly and more specifically realtime effects selection.

G•MAJOR features:
Delay, Reverb, Chorus, Flange, Pitch, Filter, Modulation, Compressor and Noise Gate. In total more than 25 algorithms!

100 factory presets • 100 user presets
1/4" balanced jack I/Os • Chromatic Style Tuner
24 bit A/D & D/A • 24 bit S/PDIF Digital I/Os

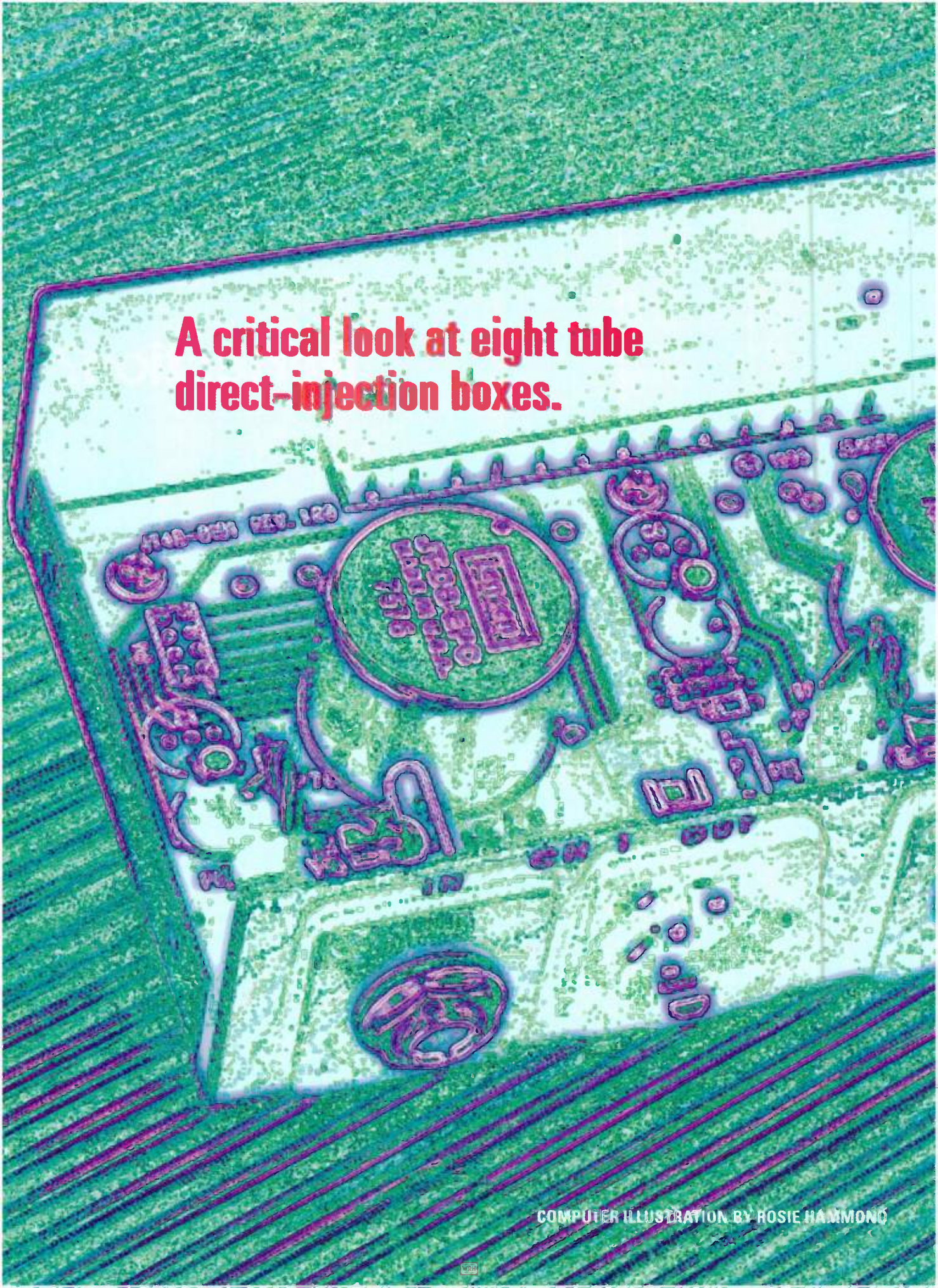
G•Major's intuitive user interface combines extensive control over realtime MIDI parameters with TC quality - to get you closer to your ultimate goal...

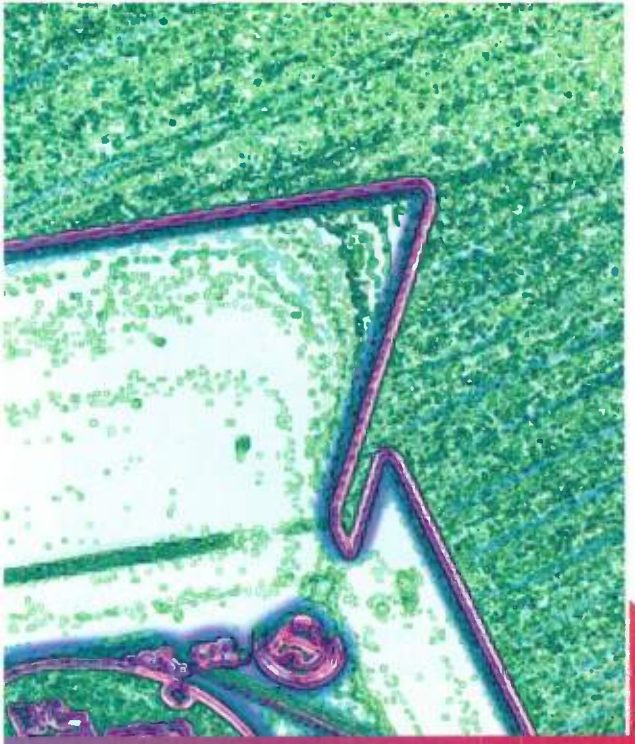
Perfection.

TC ELECTRONIC INC. USA
✆ (805) 373 1828 • [FAX] (805) 379 2648
WWW.TCELECTRONIC.COM

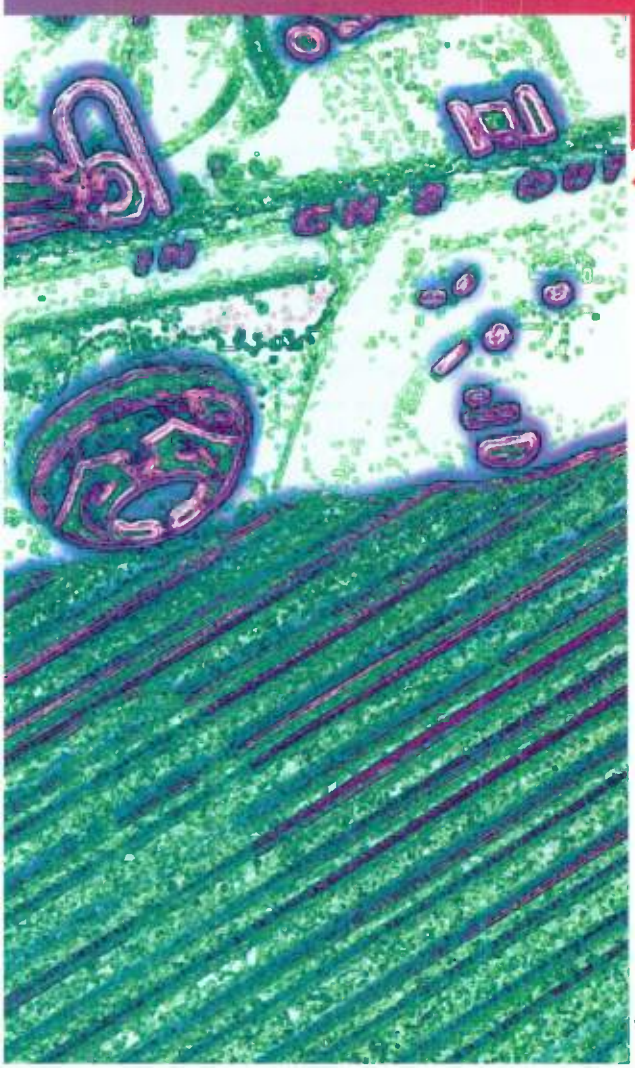
25 ANNIVERSARY

t.c. electronic
ULTIMATE SOUND MACHINES


A critical look at eight tube
direct-injection boxes.
COMPUTER ILLUSTRATION BY ROSIE HAMMOND



DIRECT ACTION



In 1980, James Demeter was thumbing through a tube-electronics book when he stumbled upon the schematic for a cathode follower circuit. That circuit would become the basis for the Demeter VTDB-2 Tube Direct, the first commercially available tube direct-injection (DI) box. The VTDB-2 appeared on the scene at a time when the pro-audio industry was fixated on solid-state equipment and many studios were discarding tube units like poison apples. Although fully aware that his "tube direct box" was a new and wonderful-sounding invention, Demeter thought no one would give a hoot, so he failed to copyright the product category name.

Today, more than a dozen tube DI boxes are on the market, and they don't appear to be going away anytime soon. Recording engineers have fallen in love—or in some cases, back in love—with the sound of tubes, and tube direct boxes are now an integral part of the modern recording chain.

What makes tube DIs so useful and compelling that nearly all pro engineers feel they must own at least one? This article will explore the benefits of DI boxes in general and tube DIs in particular. I'll offer practical examples of how to get the most out of DIs, including proper interfacing with mic preamps, recording consoles, and guitar, bass, and keyboard amps. Because all tube DIs are not alike, I'll discuss the pros and cons of different designs and feature sets so you know what to look for when purchasing a new unit. Finally, I'll look closely at the features and audio quality of eight of the hottest tube DIs on the market. I'll begin by looking at how the tube DI box evolved and why it is such a useful recording tool.

STOP THAT RACKET

Unwanted noise can bring a recording session to a halt. One perennial source is unbalanced instrument cables used with electric guitars and basses. That's because unbalanced cables are prone to picking up radio frequency interference (RFI) from sources such as TV sets, computers, and digital-effects processors. They may also pick up hum or buzz from electromagnetic interference (EMF), the evil offspring of lighting fixtures, AC outlets, and power supplies.

Guitar cables act as involuntary antennae for those invisible demons. As you boost the output of a guitar or bass being played through an amplifier, you also boost any induced noise the cable picks up. Nothing is more distracting than hearing the ninth inning of a baseball game broadcast through your guitar amp while you're trying to lay down a hot solo.

By Michael Cooper

DIRECT ACTION

A DI box solves such noise problems in two ways. First, it converts your instrument's unbalanced, high-impedance, instrument-level output signal into a balanced, low-impedance, mic-level signal, which is much more immune to induced noise. That allows you to run longer, balanced cables (from the output of the DI box) without creating a huge antenna for sonic garbage. Second, recording with a DI box lets you forego the use of microphones, which indiscriminately record environmental noise along with the musical performance flowing out of your amp.

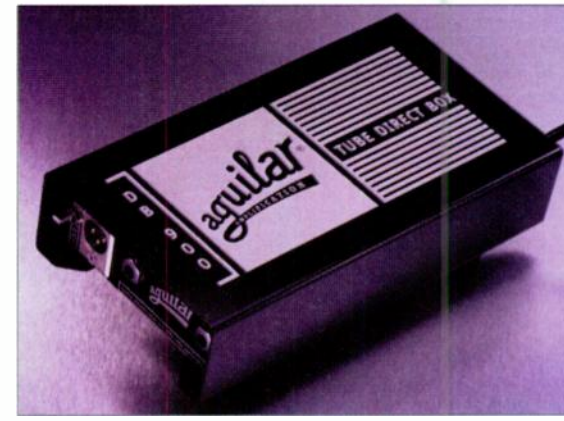
The sound of a miked amplifier or acoustic guitar can be a wonderful thing, too, so you may not want to eliminate its contribution to a song. In that case, the DI track can serve as an adjunct to the mic signal(s), or vice versa, depending on how you choose to mix the tracks. In addition, blending the DI and mic tracks together can help increase the overall signal-to-noise ratio of the combined signals.

There are other worthwhile reasons to use a DI box besides simple noise prevention. A good DI box also preserves signal quality in other ways, and typically, it provides a sound that is quite different from that of a miked amp.

SOUND OF MUSIC

Most readers know that long guitar cables can act like capacitors, killing high frequencies and resulting in a dull, lifeless sound. A good DI box can condition the instrument's output signal; that makes it less susceptible to the negative effects of long cable lengths and thus preserves the high-end sparkle of the instrument. But that isn't the only way a quality DI box can preserve the integrity of the original signal.

Every element of the recording chain, from room acoustics to recording medium, exerts a persistent influence on your tracks. Your room, for example, may impose boomy or weak bass, comb filtering, flutter echoes, or other unwanted sounds on your recordings. Or perhaps your guitar amplifier is a little ragged-out after its umpteenth bar gig,



The ultrapristine and detailed Aguilar DB 900 Tube Direct Box delivers fat, focused electric bass and lush, resonant synth tracks brimming with nuance.

and you can hear the tubes giving out and a speaker starting to break up. Moreover, that $400 mic doesn't sound as great on guitar as you had originally thought—not to mention that it's picking up the sound of the drums pounding away in the adjacent room.

A DI box is immune to room sounds and acoustic bleed from other instruments, so it eliminates those problems. In addition, it lets you record direct to tape (or hard drive), thus bypassing the mic and guitar-amp stage of the chain. The result is a cleaner, drier, more focused sound. What's more, the recording setup is greatly simplified: there's no need to hassle with mic choice and placement, mic stands don't clutter the performance area, and you can bring the performer into the control room to discuss arrangement tweaks without worrying about control-room monitor bleed.

NEW INPUT APPRECIATED

Not all DIs are created equal. In fact, the first DIs sounded dreadful. When the Demeter VTDB-2 Tube Direct arrived on the scene in 1980, most DI boxes were passive. Those early passive units employed an input transformer to buffer (alter the impedance of) the input signal. For reasons beyond the scope of this article, the input transformer would cause the instrument's signal to lose high frequencies and make the sound dull. The only way around that was to raise the transformer's impedance to a point at which there would

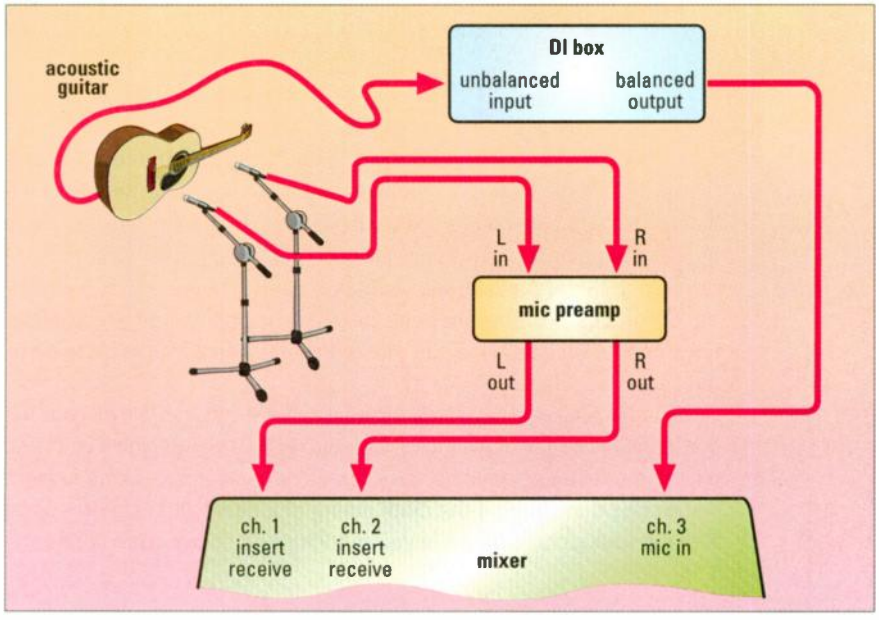


FIG. 1: A great way to record an acoustic guitar is to route the pickup's signal through a tube DI and combine it at your mixer with the signals from a stereo pair of mics.

PC Mac

DISCOVER

TC•POWERCORE

New Version from 12/01:

POWERCORE FOR WINDOWS

POWERCORE 3RD PARTY

POWERCORE INSTRUMENT

DISCOVER hi-end processing in TC quality, completely integrated with your native audio workstation! How? Simply add **TC•POWERCORE** to your existing Mac or PC audio platform, using any VST/MAS audio software and any supported sound card – that's like adding the equivalent to 2.8 GHz of sheer power, only for audio processing!

TC•POWERCORE is an incredible value, right out of the box: Run a stack of the included world famous TC TOOLS Plug-Ins – virtual versions of TC Electronic's M5000 Reverb, TC1210 Spatial Expander and Finalizer™ EQ technology. Want more? Take advantage of the limited MasterX³ introductory offer and additionally receive a **virtual Finalizer™** for industry-standard knock-out punch mastering*! Still not enough? Check out the WALDORF Vocoder, ANTARES Autotune, TC HELICON Voicecraft or other 3rd party products that will become available soon. Discover **TC•POWERCORE**!

MSRP US $1299

PC + MAC >> VST + MAS >> INSTRUMENTS >> 24/96 >> ANY I/O >> 4 DSPS + POWER PC >> $1200 US WORTH OF SOFTWARE

*Introductory offer featuring MASTER X³ ends 12/31/01

TC | WORKS

ULTIMATE SOFTWARE MACHINES

US & CANADA: TC ELECTRONIC INC. • 805.373.1828 • CALIFORNIA • US@TCWORKS.DE • WWW.TCWORKS.DE

© by TC WORKS Soft- & Hardware GmbH 1999 – 2001. All product and company names are ® or ™ trademarks of their respective holders. Specifications subject to change without notice. All rights reserved. TC WORKS, A TC ELECTRONIC COMPANY

be an unacceptable loss in signal level—as much as 40 dB. (For a more in-depth explanation of how a DI box works, see "Square One: Going Direct" on p. 96.)

A few companies, Demeter's included, had already made DIs that used semiconductor devices instead of transformers on the inputs. That design preserved the instrument's high end with virtually no loss in signal level. However, those solid-state DIs had an edgy quality to them, not to mention harsh overload characteristics.

Demeter realized that a tube can be manipulated to deliver the extremely high input impedance that a DI must have to sound transparent. A tube also preserves the input-signal level and makes the sound richer to boot. Demeter scrapped the input transformer and semiconductors, inserted a dual-triode tube in their place, and the first tube DI box was born.

Subsequent tube DIs have incorporated significant design changes. A look at the pros and cons of different designs should help you decide what's best for your applications.

INSIDE STORY

Most tube DIs available today employ a dual-triode tube. The first triode buffers the input signal; the second is often used to boost the box's output level. Some manufacturers prefer not to boost the outputs of their DIs at all, however, arguing that everyone already owns a mic preamp (and thus can boost the signal as needed) and that adding another stage of amplification inside the DI only degrades the signal quality.

As with most things electronic, there's no simple right and wrong. A high-quality output-level boost circuit can be made to sound great. Likewise, a DI-box design could conceivably forego the boost circuitry, only to degrade the signal through an oversight elsewhere in the signal path. That's one reason I tested a variety of units for this article—to learn, after the theory is laid to rest, how the units actually sound.

The outputs of most DI boxes typically run in the –40 to –15 dBm range (mic or instrument level). However, some manufacturers achieve hotter levels by using semiconductors in lieu of transformers, which automatically reduce output levels by roughly 20 dB, to electronically balance their DI outputs.

Why don't all manufacturers use this hybrid design, tube and semiconductors, to preserve 20 dB or so of gain? There are two reasons. First, transformers have far greater ground-lifting capability than electronically balanced circuits, so they reduce hum much more effectively. If you'll be using your DI only in a control room, where cable runs are typically short, an output transformer is not critical. However, for applications that require long cable runs—playing onstage, for example—a transformer-coupled DI output will do the best job of

Dynamic range... Low Latency...
Affordable... Simple...

Need a Solution?

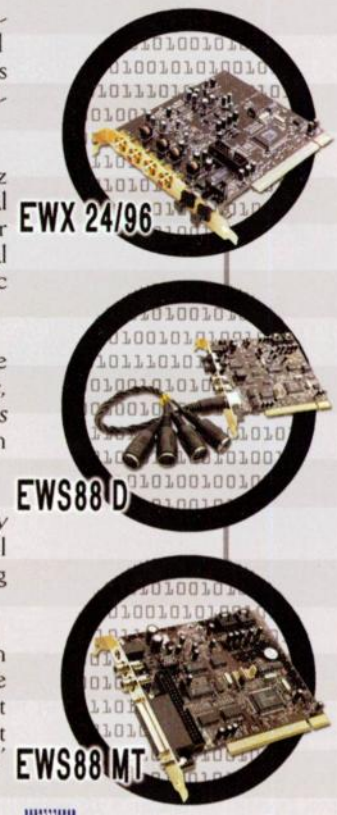
With an astonishing 2ms latency and zero-latency direct monitoring, Terratec, the #1 European Sound Card Manufacturer, offers you the best audio interface solution available.

With features like low latency, 24bit/96kHz resolution, +4/-10 analog I/O, S/PDIF digital I/O, ADAT digital I/O, wordclock, MIDI, or if you simply need tons of analog and digital inputs and outputs, there is a Terratec solution for you.

Need recording software? With the included *Emagic LogicFun, MicroLogic, SEK'D Samplitude Studio,* and *Steinberg's WaveLab* you will be producing your own albums and burning CD's in no time.

Compose Music? The popular *Fruity Loops Express* and *Arturia's STORM* will have you sampling, looping, and composing right out of the box.

Software Synthesizer and Sampling? With *GigaSampler LE* from Nemesys and the latest version of *MegaPiano* you will not only be sampling and editing your own great sounds, but you will be exploring the world's best piano samples for weeks.



So get the solution that works. Visit your local Fostex dealer and ask for Terratec.

SEK'D emagic GIGA

TERRATEC®

Distributed by: FOSTEX PROFESSIONAL www.fostex.com

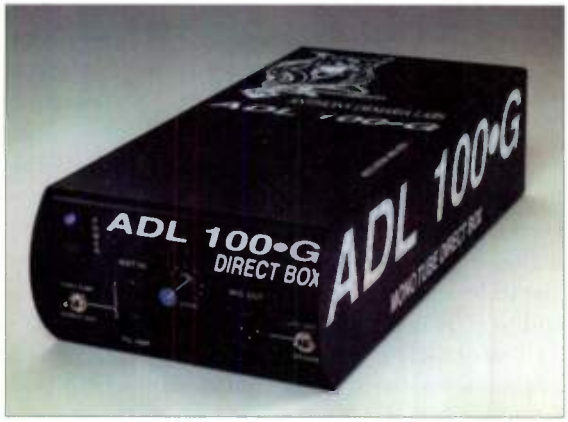
Fostex America, 15431 Blackburn Avenue, Norwalk, CA 90650, Tel: 562-921-1112 Fax: 562-802-1964

keeping induced noise to a minimum.

Using an output transformer also allows the manufacturer to maintain an all-tube design. After all, solid-state devices sound edgy, right? Again, it's not as simple as that. What matters is quality—in components and in design. A high-quality hybrid or solid-state DI, for example, can sound considerably better, and warmer, than a poorly designed all-tube box. That is partly because all transformers distort signals to some degree; they tend to saturate the sound when hit with excessive input, especially of very low frequencies, and they can also cause a mild attenuation of highs. Indeed, some people seek out particular transformers precisely because they saturate the sound (in a musically pleasing way, that is). In addition, although an all-tube DI may sound smoother or warmer than a hybrid box, your signal will almost certainly run through gobs of semiconductors located downstream in the signal chain before it reaches final mixdown.

PROGRESS IMPEDED

Just the same, I strongly consider one specification when deciding which DI box to purchase: the measure of the unit's input impedance. A DI box's input impedance has a profound impact on the sound of both passive electric instruments with magnetic pickups (such as electric guitars and basses) and acoustic instruments fitted with piezoelectric pickups (such as acoustic guitars and mandolins).

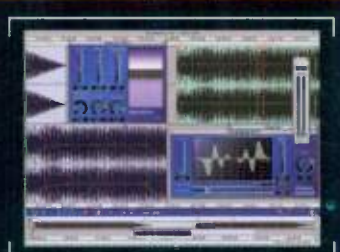


Vintage-tube-gear enthusiasts will appreciate Anthony DeMaria Labs' ADL 100-G Direct Box for its rich sound and soft top end.

A magnetic pickup is basically a coil or inductor. An inherent property of inductive devices is that, as the impedance rises, the device is able to pass increasingly higher frequencies. For that reason, DIs that offer significant input impedance will generally produce, for example, more sparkly electric-guitar tracks because they don't load down the magnetic pickups.

The piezoelectric pickup, on the other hand, is essentially a capacitor. As impedance rises, capacitive devices are able

With WaveBurner Pro, the CD Burning and Mastering software for Mac, the clearly laid-out graphic interface makes it easy to precisely position Track and Index Markers directly in the displayed waveforms. Always keep the complete overview while editing and arranging songs. But WaveBurner Pro also offers much more: integrated high-end Emagic mastering plug-ins, support for Firewire CD burners and VST plug-ins, and compatibility with all current audio formats. As well as exceptional sound quality thanks to internal 32 Bit signal processing. 24 Bit audio files are first converted to 16 Bit CD format at the mastering stage, using the highly-regarded POW-r dithering algorithm. That's the way professionals leave their mark. WaveBurner Pro – the intelligent alternative for CD Mastering and Burning on Macintosh.



Technology with Soul.

www.emagic.de

to pass increasingly lower frequencies. Furthermore, piezos need to see a much higher impedance than magnetic pickups to be totally rid of loading effects and to pass full-bandwidth signals. So a DI must offer high input impedance to produce acoustic-guitar tracks with full bass content.

Modern tube DIs typically offer from 1 megaohm to 27 megaohms input impedance. Generally, units at the extreme low end of the range produce a softer, more muted sound, and those with a high input impedance tend to capture an extrasparkly sound (including more of the pick-strike sound, for example).

However, you can't specify the lowest acceptable input impedance—which is another reason why sonic comparison is necessary. But now you can see why the earliest DIs, with their transformer-coupled inputs that provided only 10 to 100 kilo-ohm impedance, stifled the highs on electric guitars and cut off the lows on acoustic guitars that have piezo pickups.

Using a DI box for a synthesizer will not improve the instrument's frequency response. Synths are not sensitive to the impedances you're likely to encounter with a mic pre or with the line inputs on your console, simply because they have no capacitive or inductive pickups to load down.

Ditto for an active bass guitar (that is, a guitar that has battery-powered electronics): the instrument's active circuitry preconditions the pickup's signal before it goes to the DI box (or wherever), and so it is not sensitive to impedance. You can therefore plug a synth or active bass guitar directly into an outboard preamp or console input, and it should sound pristine. You may still opt to warm up the sound first by patching the instrument through a tube DI box. However, if the DI features tube-gain boost circuitry (rather than a unity-gain audio path), it's possible that you are actually degrading the signal slightly by inserting that extra stage of amplification in the signal path—it all depends on the quality of the gain circuitry. In such cases, let your ears be the judge.

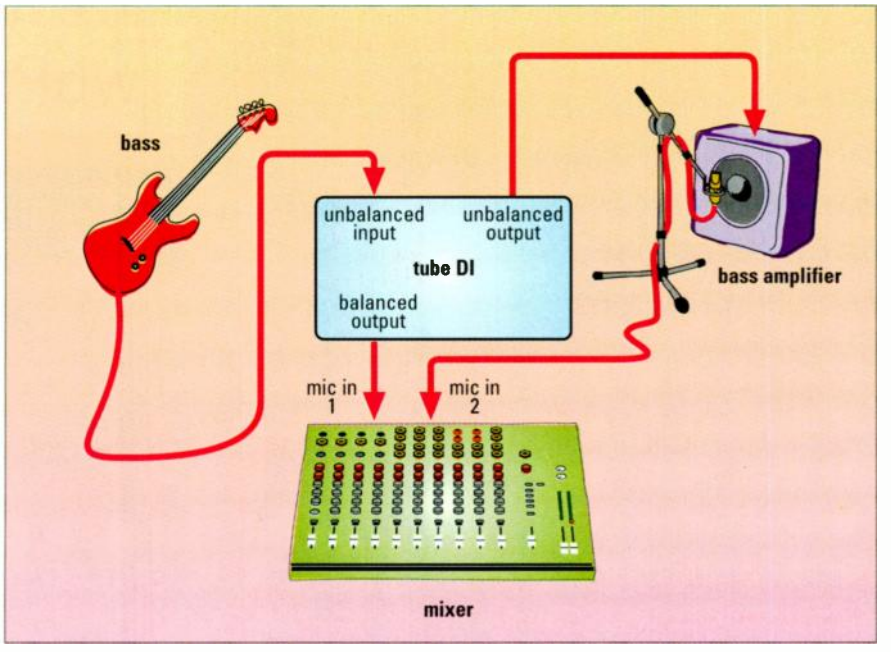


FIG. 2: You can split the output of your electric bass guitar at the tube DI, sending the DI's balanced output signal to your mixer's mic input and the unbalanced output to a miked amplifier. The mic's signal can then be combined with the DI's signal at the mixer for a fatter sound.

INS AND OUTS

Consider the external features when choosing a tube DI box. Any DI box worthy of consideration should offer a high-impedance, unbalanced ¼-inch input jack (for plugging in instrument cables); a low-impedance, balanced XLR output connector (for patching the DI's output to an outboard mic preamp or console mic input); and a high-impedance, unbalanced ¼-inch output jack (for sending the DI's signal to an instrument amplifier).

In some designs, a tube DI's unbalanced output is muted directly off its input jack—that is, it's wired in parallel with the input so that what goes into the box is exactly what comes out at the unbalanced output. When you patch that type of DI output to your amp, you'll get exactly the same sound as you would by plugging the instrument directly into the amp (as long as the cable lengths aren't unreasonably long).

In another design, the DI's unbalanced output may follow its tube input buffer. That offers the benefit of warming up an instrument's signal before it goes to an amp. Another benefit is that the tube input buffer gives the DI's unbalanced output a constant impedance that won't vary with frequency. Because an electric guitar's high-frequency response does vary with impedance, long cable runs tend to dull the instrument's highs. The constant output impedance of a tube DI's unbalanced output greatly mitigates high-frequency rolloff, letting you run cables as long as 40 or 50 feet to your amp without dulling the sound. That's why savvy live performers use a DI with a tube-buffered unbalanced output to feed an amp located across a large stage.

Other tube-DI manufacturers incorporate yet another design that places the unbalanced output after a tube-gain boost stage (in nonunity boxes). Although you certainly don't need that extra amplification if you're patching in to a guitar amp, the extra tube stage typically warms things up even more.

Having two DI outputs—an unbalanced out for your amp and a balanced out for your mic pre—allows you to play with two strikingly different sounds.

REASON

THE STUDIO OF YOUR DREAMS

IS YOURS FOR 20 MINUTES*

In case you didn't already know: Propellerhead Reason is a beast of a music system. A self-contained, all-in-one software studio in the shape of a classic studio rack, filled to the brim with all the gear you could ever dream of: Analog synths, Samplers, Step-time drum machines, ReCycle-loop players, Mixers, Effects and a lightning fast multi-track sequencer. You want even more machines? No problem. Reason lets you create as many of each instrument or effect as your computer can take, so you can build yourself a serious monster rack. If you ever wished you had eleven samplers and eight compressors, Reason is for you.

Reason lets you make more music. More often. Reason looks great, sounds even better, and has more knobs and controls than a nuclear power plant. But it's Reason's simplicity that makes all the difference. Just start it up, get friendly with the machines, and you will find yourself making music within three minutes. Getting started is that simple. And so is getting hooked. Once you get bitten by Reason you'll find it hard to quit, but when you have to, just save your song and all your sounds and settings will be saved along with it, so you can pick up exactly where you left off, whenever you want to.

Reason makes sense. Reason is a fast, flexible power-pack that acts on your every command. In fact, it's so flexible it can be tailored to suit your specific needs. Reason easily adapts to you and your working methods; use it as an all-in-one midi studio in which you create and mix your own tracks, or sync it to an audio sequencer and process the outputs with plug-in effects. You can even play Reason's instruments from another MIDI sequencer. And we're still just scraping the surface. With patching powers rivaling modular synthesizers, full graphical automation, and millions of other features you didn't even know existed, you'll never run out of options. With Reason, you make the rules. And the music.

***How to obtain your 20 minutes of free Propellerhead Reason studio time:** Point your browser to www.propellerheads.se/reasondemo, download the Reason 1.0 demo, install it, and you're rolling! The demo is just as powerful as the full version, but it only works for 20 minutes at a time. It is a sweet 20 minutes, though.

THE REASON RACK 01: MIDI IN DEVICE/64-CHANNEL AUDIO INTERFACE 02: MIXER 03: EFFECTS 04: SUBTRACTOR POLYPHONIC SYNTHESIZER 05: NN19 DIGITAL SAMPLER 06: EFFECTS 07: DR REX LOOP PLAYER 08: DEVICES CAN BE FOLDED IN 09: EFFECTS 10: MATRIX PATTERN SEQUENCER 11: REDRUM DRUM MACHINE 12: EFFECTS 13: REBIRTH INPUT MACHINE 14: THE REASON SEQUENCER 15: TRANSPORT

propellerhead

www.propellerheads.se

Distributed exclusively in the USA and UK by: **MIDIMAN, Inc.** www.midiman.com

I'M BIASED

Morris Hayes

Programmer & Keyboardist with Prince & The New Power Generation
Producer for Prince's New Power sampling library

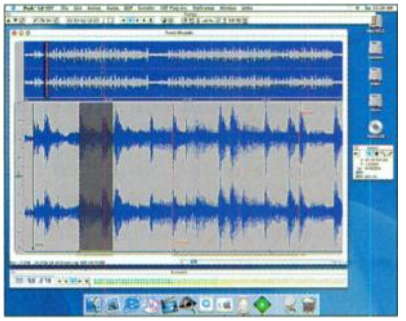
Photographed by Mike Woodside at Paisley Park Studios, Minneapolis

There is an intersection between technology and art. It's where things happen. It's a proving ground. It's where sonic creativity flows on a path of least resistance. At BIAS, it's where we put our energy. Chances are, it's where you put yours.

Morris Hayes knows that intersection well. As a veteran band member for Prince, and now as the producer for Prince's New Power sampling library, Morris depends upon BIAS audio software products to keep his own sonic creativity flowing: "BIAS gives me what I need — to do what I do. Anything I can hear in my head, BIAS software lets me turn into reality. Simple as that."

© 2001 BIAS Inc. Peak, Deck, Vbox and BIAS Studio are trademarks of BIAS Inc. All other trademarks are property of their respective holders. All features, prices and offers are subject to change. Prices are SRP for US residents in $US. Certain features such as the number of simultaneous plug-ins or i/o's are dependent upon specific versions of BIAS software along with CPU and other equipment capabilities. Giveaway offer void where prohibited. See www.bias-inc.com for rules.

The BIAS family of professional audio tools:



Peak™ 3.0

Edit and process audio faster, more powerfully than any competing software — now for OS X and OS 9.

The world's most popular two-track digital audio editing/processing application for the Macintosh is available with extensive plug-in support [including VST] and unique tools such as LoopSurfer™. 32-bit processing delivers pristine audio quality. Integrated Vbox support. Supports Sound Manager plus Apple's powerful new CoreAudio standard, with performance beyond 24-bit / 96kHz.

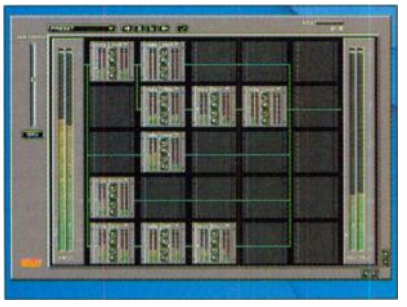
***Versions start at just $99** [with valuable extra software]*

Deck™ 3.5

The best value in an audio workstation — available soon with OS X and OMF compatibility.

BIAS Deck delivers advanced multitrack editing, mixing, and signal processing — with support for 64 simultaneous tracks, 999 virtual tracks, realtime automated mixing, CoreAudio or ASIO, and VST plug-ins. Timecode support, OMF, and frame-accurate QuickTime sync make Deck VST an ideal audio-post solution for Final Cut Pro, iDVD, Media 100, Avid, Premiere, and other video/DVD editing systems.

***Versions start at just $99** [with valuable extra software]*

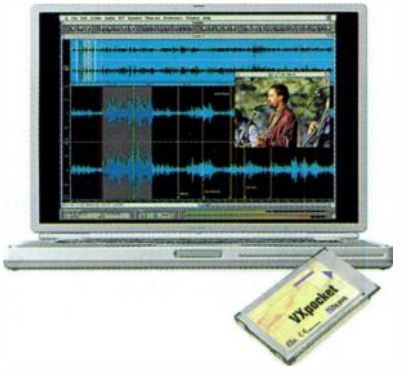


Vbox™ 1.0

The ultimate multi-effects control environment — millions of sonic combinations, quickly and easily.

On its own — or with Peak, Deck, or any other VST host application — Vbox combines up to dozens or even hundreds of plug-ins per channel, in series, parallel, or series-parallel. Hot-swap plug-ins or instantly mute, solo, mix, and edit parameters in realtime. An amazingly creative tool for music, DJ'ing, audio-post, sound design, and radio. Includes lots of free plug-ins and more.

***Just $129** [Vbox SE is free with Peak VST/TDM & Deck]*



BIAS Studio™ bundles

Complete desktop and PowerBook audio solutions.

Now you can get BIAS' advanced professional audio tools — including Peak, Deck, Vbox, and valuable third-party products like Roxio Toast 5 Lite and Waves AudioTrack — bundled together at huge savings. Several BIAS Studio PowerBook Editions are also available, featuring the Digigram VX Pocket PCMCIA card, the ultimate portable audio I/O solution.

BIAS Studio bundles start at just $179

www.bias-inc.com • 1 [800] 775-BIAS

bias

sound creative

Thank you, Morris; that's, well, music to our ears. It also pretty much describes our own goals. See, giving you the tools you need to hear what's in your head (and yeah, maybe some stuff you never thought you'd hear) is not our marketing strategy. It's our irrepressible passion. And we do it better than anyone.

Admittedly, we're biased.

But then again, aren't you?

Win Cool Free Stuff!

We're giving away tons of free stuff — an Apple Titanium G4/500MHz PowerBook, plus free BIAS Studio bundles!

*See **www.bias-inc.com** for details. Enter by Jan. 31, 2002. No purchase necessary!*

You can choose which one you like best or use both patches simultaneously and combine their signals at your mixer for a more complex, layered sound.

GAINING CONTROL

A couple of other DI-box features are worth noting. Most DIs, whether tube or solid state, provide a ground-lift switch to reduce hum. Gain-boost circuitry may also be included; it is accessed with a switch that engages a fixed amount of boost or with a continuously variable knob.

Relatively few DIs provide a "speaker" or "amplifier" input jack. Those that do let you plug the output of your amp in to the DI. A switch on the DI must be set to Speaker mode so that the DI offers the correct input impedance for the setup; otherwise, distortion and equipment damage may result. Although having extra features never hurts, I've always found that is the worst way to use a DI box. The sound is always so bad that I can't see why anyone would want to run the electronic output of an amplifier through a DI box. If you want a "live" sound and you don't want to mic a speaker cabinet, several speaker emulators on the market produce results far superior to a DI box used in that manner.

All tube DIs come equipped with a power cord, and most also come with an on/off switch and power-status LED or lamp. That means that tube DI boxes require a nearby power outlet—an important consideration for live performers.

CREATIVE ROUTING

You can patch a DI in to your system in various ways. As with other types of tube gear, I always let my tube DI warm up for at least 20 minutes before using it to record. An hour is even better. A cold tube unit is a recipe for noisy and inferior-sounding tracks.

The simplest way to use any direct box is to patch the instrument into the DI's unbalanced input and patch the DI's balanced output into an outboard mic pre or console mic input. Whenever I record an acoustic guitar that has a pickup, I route the pickup's output through a DI box in that manner in addition to miking the guitar with a stereo pair of condensers (see **Fig. 1**). Recording each signal to a separate track allows me to choose any combination of the two miked tracks and one DI track at mixdown. I typically pan the two miked tracks apart (for example, at 10 and 2 o'clock) and add in a little bit of the DI track between them (at 12 o'clock) to anchor the sound.

You can usually fatten the sound further by delaying the DI track so that it's in phase with the two miked tracks. It takes about 1 ms for the guitar's sound to reach a mic positioned 1 foot away. Delaying the DI signal by the same amount (1 ms for every foot the mic is from the guitar) puts it in phase with the mic signals. That alignment technique reduces phase cancellations and comb filtering that would otherwise thin out the sound.

Electric bass guitar tracks can be fattened up using a similar technique (see **Fig. 2**). Simply patch the bass's output in to the tube DI's unbalanced input, the balanced output of the DI in to a mic preamp's or mixer's mic input, and the DI's unbalanced output to the amp. Mic the amp and route the miked signal to a separate channel on the board. Now you can record the DI and mic signals to separate tracks and combine them at mixdown, delaying the DI signal to align it with the mic signal for a fatter sound. If you're short on tracks, you can always align the two signals during studio sound check and submix them to one track while you record. (That setup works great for recording six-string electric guitars too.)

TUBE DI BOX FEATURES

Manufacturer/Model	Channels	All-Tube	Unbalanced Output Topology	Input Impedance*	Gain Boost	Price
Aguilar DB 900 Tube Direct Box	1	yes	TB	12.8 MΩ	unity	$529
AMB Tube-Buffered Direct-Injection Box	1	yes	TB	20.0 MΩ	15 dB	$595
Anthony DeMaria Labs ADL 100-G Direct Box	1	yes	TG	10.0 MΩ	0 dB**	$599
Demeter VTDB-2b Tube Direct	1	yes	TB	27.0 MΩ	16 dB	$599
D. W. Fearn VT-I/F Vacuum Tube Instrument Interface D.I.	2	yes	P	1.0 MΩ	unity	$1,500
Manley Tube Direct Interface	1	yes	TB	10.0 MΩ	17 dB	$575
Tube Works 4001 Real Tube Direct Input	1	no	TB	1.0 MΩ	12 dB	$219
Uncle Albert's VTD-2A Vacuum Tube Direct	1	yes	TB	>1.0 MΩ	N/A	$450

Key

TB: unbalanced output follows the tube input buffer but occurs before any gain stage.

TG: unbalanced output is placed after the tube input buffer and gain stage.

P: unbalanced output is wired in parallel with the DI's input, placing it before the tube input buffer.

* Input impedance is noted only for high-impedance, unbalanced instrument input.

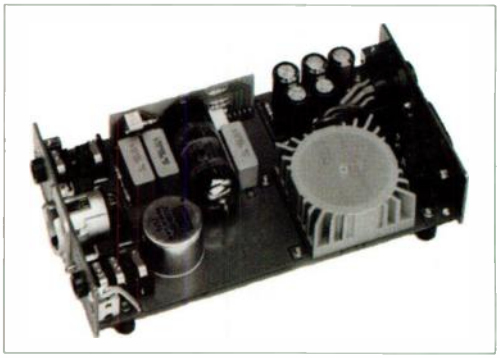
** The ADL 100-G's gain control attenuates up to 21 dB, instead of boosting gain.

RULES OF ENGAGEMENT

More than a dozen tube DIs are on the market. Those evaluated for this article meet several criteria. First, all are dedicated DIs; no dedicated line preamps or mic preamps with DI inputs were included. All units feature tube-buffered inputs and a balanced XLR, mic-level output, and all fall within a specific price range—$200 to $800 per channel—so extremely high-end units are not pitted against budget models.

The eight boxes I will describe are the Aguilar DB 900 Tube Direct Box ($529), the AMB Tube-Buffered Direct-Injection Box ($595), the Anthony DeMaria Labs ADL 100-G ($599), the Demeter VTDB-2b Tube Direct ($599), the D. W. Fearn VT-I/F Vacuum Tube Instrument Interface D.I. ($1,500; 2-channel), the Manley Tube Direct Interface ($575), the Tube Works 4001 Real Tube Direct Input ($219), and the Uncle Albert's VTD-2A Vacuum Tube Direct ($450). Note that in cases in which a manufacturer offered mono and stereo versions of the same basic model, I reviewed only the mono unit. If you're interested in a mono unit I tested but are looking for a stereo DI, contact the manufacturer—a stereo version may be available.

All units tested feature high-impedance, unbalanced ¼-inch I/O, but they differ as to where the output is derived in the circuit. Some units have the output before the tube buffer, others immediately after, and still others after a gain-boost stage. In addition, all of the units provide an all-tube audio path and transformer-balanced XLR output except for the Tube Works 4001 Real Tube Direct Input, which features a hybrid design with electronically balanced outputs. Finally, each DI box tested is a portable desktop or floor unit (that is, sans rackmounts), and each has a ground lift. (For a tidy comparison of the units' features and specs, see the table, "Tube DI Box Features.")



The AMB Tube-Buffered Direct-Injection Box offers a warm, mellow sound with tight, deep bass.

To test the units, I recorded electric guitar (a 1962 Fender Stratocaster), bass (Kramer Pioneer), and synthesizer (Roland Juno 106 set to a raspy pad) through all eight boxes and then compared the tracks. Each instrument/preamp combination was recorded to separate ADAT tracks against backing

tracks of drum set and acoustic guitar. The guitar, bass, and synth tracks were recorded through each DI in turn, with the DI's output routed through a Millennia Media HV-3 mic preamp. I chose the HV-3 for its neutrality and solid-state design. I wanted as little coloration as possible from the preamp so as to better hear the tube characteristics of the DI box. I decided against recording any instruments through an amp because an amp's severe sound coloration precludes an accurate assessment of the DI box.

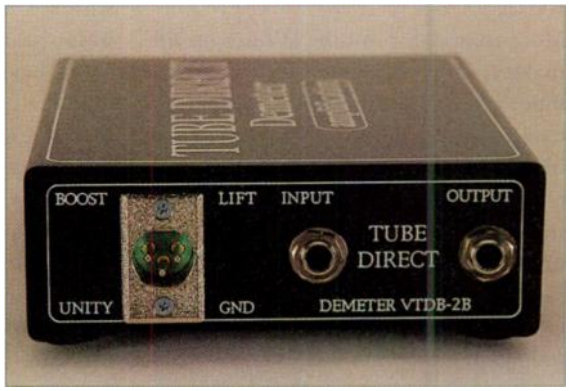
All tracks were recorded at 20 bits and 48 kHz through the A/D converters of a Yamaha 02R digital mixer. The 02R was slaved to an Apogee Rosetta converter providing master clock (an amazingly great combination, by the way). Great care was taken to record all tracks at consistent levels, just below 0 dBFS.

I listened to all the tracks through high-end, ultraflat (50 Hz to 22 kHz, ±0.5 dB) KS ADM 2 monitors powered by a Hafler P3000 Trans-nova power amplifier. The monitors were coupled to an Acoustic Sciences Corporation Attack Wall acoustical environment. I evaluated DI tracks soloed and in the mix. All evaluations are entirely subjective—what you're getting are my opinions.

Aguilar DB 900 Tube Direct Box. I was so impressed with the single-channel, all-tube DI from Aguilar that I bought one when it first hit the streets last winter. It has an ultrapristine, minimalist audio path with no gain boost; hence, it offers the weakest output level of all the units I tested. But the trade-off is well worth it.

On bass, the DB 900 offers the best of all worlds: perfectly balanced tone, low noise, a clear top end with truckloads of nuance and air, and an extended, tight bottom. You can clearly hear the 12AX7 tube working its magic; electric bass sounds very rich and warm through this awesome DI.

Interestingly, my Stratocaster sounded a tad thin through the DB 900. But what the tone lacked in fullness it more than made up for with nuance, sparkle, and detail. On synth pad, the Aguilar dominated the field once again, offering by far the richest, most resonant, and clearest tone of the units tested.



The versatile Demeter VTDB-2b Tube Direct balances its tight, deep bottom end with a smooth presence and lush overtones.

AMB Tube-Buffered Direct-Injection Box. AMB's German-made, all-tube DI offers 15 dB of gain boost through a front-panel switch. A bombproof chassis and detachable AC cord add to the unit's portability. The single-channel, unventilated AMB became hotter than the other DIs, but according to AMB, that is not cause for concern because the unit's components are designed to withstand high operating temperatures.

The Kramer Pioneer bass had a slightly dull top end when played through the AMB DI, but the bottom end sounded tight and deep. The Strat sounded mellow and warm, if slightly lacking in clarity and openness. On the synth pad, AMB's DI offered the thickest low mids and overall darkest timbre of the units tested, if only by a hair.

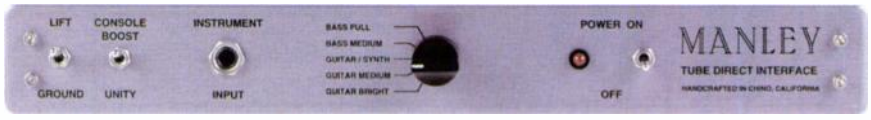
Anthony DeMaria Labs ADL 100-G. The single-channel, all-tube 100-G offers a continuously variable rotary gain control, but it attenuates (by as much as 21 dB) rather than boosts the output level. A two-position switch places the unbalanced output immediately after the tube input buffer or after the gain attenuator. Even with no attenuation, the 100-G offered the second-weakest output of the eight units. That won't be a problem if you have access to a high-quality mic preamp.

The 100-G offers a vintage-style bass-guitar sound with a soft top end and overall fat tone. Middle-bass frequencies sounded slightly hyped to my ears.

The 100-G imparted a fatter tone to my Strat than the Aguilar, but it was not as fat or unrestrained as the Tube Works, AMB, and D. W. Fearn DIs. Compared with those units, the 100-G sounded a little stiff or compressed. Also, the 100-G was a bit shy on high-frequency detail on guitar. But this is a quality unit, and some of those distinctions, though audible, were subtle. On synth, the 100-G was one of the richest, most resonant-sounding DIs of the bunch.

Demeter VTDB-2b Tube Direct. The Demeter VTDB-2b is a modified version of the seminal VTDB-2. The single-channel unit has undergone no design changes since 1987—but then, why should it? This all-tube DI is my overall favorite for pop, rock, and country electric-guitar tracks. It gave my Strat an extremely detailed and transparent tone yet was fuller sounding than the Aguilar DB 900.

Patched through the VTDB-2b, electric bass easily cut through the mix, and its sound was present and rich in harmonics yet not at all thin or harsh. The DI's deep bottom end balanced out the overall tone beautifully. On the Juno 106, the VTDB-2b sounded a bit prominent in the upper midrange but, again,



Manley's Tube Direct Interface uniquely offers five equalization presets for electric bass, guitar, and synthesizer.

not at all harsh. If you're looking for a fat, lush tube DI with a lot of presence and a torrent of rich overtones, the VTDB-2b is your ticket to paradise. This one goes on my must-buy list.

D. W. Fearn VT-I/F Vacuum Tube Instrument Interface D.I. In dollars per channel, the dual-channel VT-I/F is the most expensive DI that I tested. Also the prettiest and most impressive-looking DI of the bunch, the 15-pound cherry red unit features a chassis machined from solid ¼-inch-thick aluminum plate and finished with a tough polyurethane aircraft finish. Heavy-duty toggle switches (for ground lift and power on and off functions), custom Jensen transformers, and a detachable AC cord enhance the handcrafted unit's appeal.

Like the Aguilar DB 900, the all-tube VT-I/F shuns gain-boost circuitry in favor of a minimalist audio path. Nevertheless, the VT-I/F offers considerably higher output level than the DB 900. The VT-I/F is one of the few tube DIs that places its unbalanced output before the tube input buffer.

The VT-I/F lent a rich tone to electric bass. The top end was a tad muted, but the low end was extremely tight and deep. My Strat oozed warm, liquidy, round tones through D. W. Fearn's cream machine. Synth pad tracks recorded through the VT-I/F confirmed that this was the mellowest-sounding DI tested.

The D. W. Fearn VT-I/F Vacuum Tube Instrument Interface D.I. is an excellent choice for mellow, round, liquidy electric-guitar and bass tracks.

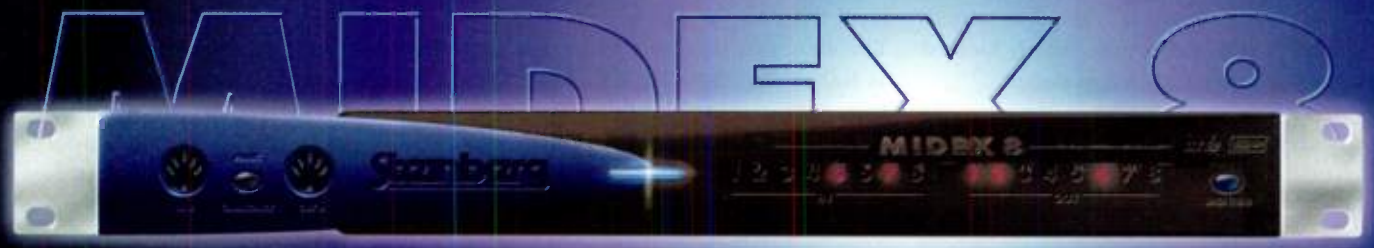
Manley Laboratories Tube Direct Interface. The Manley Tube Direct Interface features five presets that are switched using a stepped rotary knob on the faceplate. The presets vary the corner frequency of a 6 dB–per–octave highpass filter, optimized for recording different instruments. The Bass Full setting is 3 dB down at 12 Hz; Bass Medium rolls off at 42 Hz, Guitar/Synth at 100 Hz, Guitar Medium at 250 Hz, and Guitar Bright at 550 Hz. All five curves begin to gently roll off above 8 kHz.

The Tube Direct Interface can be operated in Unity or Console Boost mode.

VST
The System

The Event Machine

MIDEX 8



Steinberg presents the return of "Hardware Sequencer Timing" to modern multitasking operating systems.

Everyone knows about the timing precision of hardware sequencers – Steinberg now brings that level of timing accuracy to modern operating systems. **Linear Time Base™** offers you the best of both worlds: Ease of use and fantastic timing!

Steinberg's Midex 8 is the first interface to fully support this new technology.

The **LTB™** communication protocol defines to sub-millisecond accuracy exactly when a MIDI event should leave the MIDEX 8.

The benefit of the MIDEX 8 unit is to send the events at the right moment, free from any further intervention of the computer's operating system.

- ★ 8 separate MIDI in and outputs, 128 independent MIDI channels
- ★ Easy plug & play USB interface, no external power supply necessary when used in standard USB mode
- ★ Supports Windows® 98 SE (Second Edition), Windows® 2000 and Windows® ME
- ★ Additional MIDI Thru feature
- ★ Supports LTB™ – computer independent, sub-millisecond timing accuracy
- ★ Numbered MIDI port LEDs for activity monitoring

LTB™ can only be used with Steinberg Cubase VST products and products which support the LTB™ protocol!
Mac OS and Mac OMS drivers in preparation
All rights reserved. © Steinberg Media Technologies 2001.

steinberg
Creativity First

US: (818) 678-5100 • FAX: (818) 678-5199 • Canada: (416) 789-7100 • Fax: (416) 789-1667

The Tube Works 4001 Real Tube Direct Input is the best-sounding tube DI in its price range.

The modes are selectable using a front-panel switch. In Console Boost mode, the signal gets a 17 dB gain boost.

The Manley unit I tested had one disconcerting quirk: the detachable AC cord did not fit into its IEC connector securely. As a result, the power temporarily failed whenever I gently lifted the unit to view its rear-panel connections. (According to Manley Labs, that problem has not been reported on other Manley units.)

On electric bass, this all-tube DI offered a well-balanced tone with the exception of a slightly understated top end. The overall timbre on electric guitar was warmer than that produced by the Aguilar DB 900 and Demeter VTDB-2b, but not as detailed. The Manley DI lent a nice overall balance to the sound of the synth pad. The timbre was a tad clearer than the AMB's, but not quite as clear in the upper mids as the sparkly Demeter.

Tube Works 4001 Real Tube Direct Input. Live performers will appreciate the hands-free control offered by the inexpensive Tube Works 4001, which offers large rocker switches for gain boost, ground lift, power on/off, and normal (instrument)/speaker impedance settings, all conveniently located on the unit's top chassis panel.

The speaker impedance setting works with the unit's speaker/loop out ¼-inch jack, which is wired in parallel with the DI's input jack. To use that setup, set the DI's impedance rocker switch to speaker, patch your amplifier's output in to the 4001's input jack, and patch the speaker/loop out jack to your amp's speaker. That arrangement lets you send your amplifier's output through the 4001 without killing your speaker's output, so you can simultaneously mic your amp. (As mentioned earlier, I've never found that sort of patch to sound good, but having the extra capability doesn't hurt anything.)

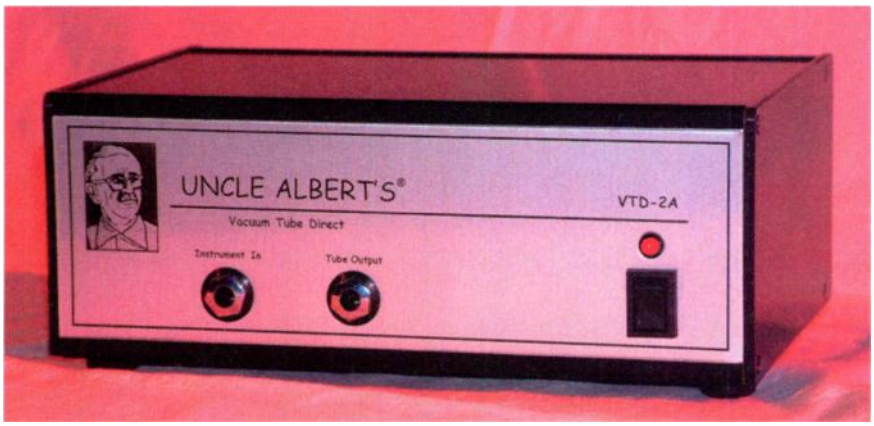
The hybrid (tube and solid-state) 4001 provides 12 dB of switchable gain boost, which, in combination with its other circuits, gives it a higher output level than all the other test subjects. The 4001 gets fairly warm, though not as hot as the AMB Tube-Buffered DI Box. The unit uses a lump-in-the-line power supply with a detachable but flimsy power cord, which detracts somewhat from its roadworthiness. (According to Tube Works, the external power supply was chosen to further reduce noise in the unit.)

The Tube Works 4001 lent a soft, cottony top end to bass guitar, but the bottom end was tight and deep. In fact, this DI offered the deepest bass of the bunch. On electric guitar, the 4001 could have used more high-frequency detail, but the overall tone was otherwise wonderfully balanced. The 4001 also lent a wonderful tone to my Juno 106; the timbre's richness and resonance were second only to the Aguilar DB 900's. Considering its modest price, the 4001 is a surprisingly good performer.

Uncle Albert's VTD-2A Vacuum Tube Direct. The VTD-2A features an all-tube audio path, custom-built output transformer, and continuously variable output-level control. The output-level control boosts the DI's gain, but not at a tube stage. Rather, it changes the resistor network just before the output transformer so that the transformer receives more input level. (The amount of gain boost the circuit provides was undocumented.)

On electric bass guitar, the VTD-2A did not provide as deep a sound as the other review units. But the sound was the most live, taking on a slightly amplified character. I could really hear the 12AX7 tube's magic in this unit. The tone was richly textured and present, though less so than the Demeter VTDB-2b's.

Uncle Albert's tube DI is an excellent choice for electric six-string guitar tracks



Uncle Albert's VTD-2A Vacuum Tube Direct produces a slightly aggressive, richly textured sound that flatters electric guitars and synths.

MPX 200

24-BIT DUAL CHANNEL PROCESSOR

Internal power supply
High impedance inputs for instruments
Full MIDI control
Independent processing on each input
Up to 5.5 seconds of delay
Dual effects
Simultaneous analog and digital outputs
S/PDIF input and output

240 presets; 64 user programs

24-bit A/D, D/A, and internal processing

Proprietary LexiChip® DSP engine

Built-in digital compressor

World-class reverb

The MPX 200 utilizes Lexicon's most powerful DSP, the proprietary LexiChip®

Lexicon
A Harman International Company

3 Oak Park, Bedford, MA 01730-1441 | Tel: 781-280-0300
Fax: 781-280-0490 | www.lexicon.com/mpx200

You need slammin' drum loops, ambient synth pads, apache shakers, and an ud?

We got 'em. All online. Searchable in seconds.

Instant Access to the Sounds You Need™

Starting at only $29.99 per month!

Finding the right sound has never been easier. Go to **sonomic.com.** Discover the planet's largest online library of samples and sound FX.

sonomic™

some of our partners:

©2001 Sonomic. All rights reserved. 1-877-SONOMIC

DIRECT ACTION

needing a little extra verve. Although lacking somewhat in low-bass tone and sounding a tad bright—not generally a problem because low bass tones on electric-guitar tracks don't usually help out in a full-band mix anyway and may even mask the drums and bass—this DI made my Stratocaster sound really lush and alive. I received similarly good results recording synthesizer through the VTD-2A.

DOWN THE TUBES

If you're on a tight budget and can't afford a clean, quiet mic preamp with at least 60 dB of gain, consider buying the Tube Works 4001 Real Tube Direct Input for your DI duties. It is easily the best-sounding tube DI in its price range, and it offers generous amounts of clean gain boost. Just be aware that the 4001's flimsy power cord makes it more vulnerable to rough handling and therefore less suited to itinerant use or to placement near drunken musicians and bar patrons.

If, on the other hand, you have a high-quality mic preamp at your disposal that can crank out at least 60 dB of gain, the Aguilar DB 900 is a must-have. The DB 900 exhibits all of the audiophile qualities one could hope for in a piece of pro-audio gear, delivering a clear, detailed, tightly focused, and well-balanced sound from deep lows to airy highs. The DB 900 is my favorite DI for recording electric bass guitar and synth.

The Demeter VTDB-2b is my first choice for recording electric guitars, at once offering sparkling detail, warmth, and presence. It also sounds outstanding on electric bass and synthesizer. It delivers a present sound balanced with tight, deep bass.

Those searching for a mellow guitar tone will want to investigate the D. W. Fearn VT-1/F Vacuum Tube Instrument Interface D.I., the AMB Tube-Buffered Direct-Injection Box, and the Manley Tube Direct Interface. Fearn's DI wins top honors here.

Tube DIs can give your instrument that focused, warm sound you've been lusting after, without costing you an arm and a leg. This is one time when having your music go down the tubes is a good idea.

MANUFACTURERS

Aguilar Amplification LLC
tel. (800) 304-1875
e-mail info@aguilaramp.com
Web www.aguilaramp.com

AMB (dist. by the John Hardy Co.)
tel. (847) 864-8060
e-mail johnwellshardy@home.com

Anthony DeMaria Labs
tel. (845) 256-0032
e-mail anthonyadl@aol.com
Web www.adl-tube.com

Demeter Amplification
tel. (818) 994-7658
e-mail info@demeteramps.com
Web www.demeteramps.com

D. W. Fearn
tel. (610) 793-2526
e-mail dwfearn@dwfearn.com
Web www.dwfearn.com

Manley Laboratories
tel. (909) 627-4256
e-mail emanley@netcom.com
Web www.manleylabs.com

Tube Works (dist. by Genz-Benz Enclosures)
tel. (480) 941-0705
e-mail info@genzbenz.com
Web www.genzbenz.com

Uncle Albert's Amplifier
tel. (800) 416-2444
e-mail uncleal@iei.net

Michael Cooper *is the owner of Michael Cooper Recording, located outside the beautiful resort town of Sisters at the base of the Oregon Cascades.*

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

If you were to buy each amp, guitar and effect found in the new VGA Series amps it would cost you $27,468.00, *including the 6 bucks for the capo.*

Simply put, the VGA-5 and VGA-7 V-Guitar Amplifiers feature the most powerful and complete modeling technology on the planet. The VGA-5 offers up an unparalleled combination of amps, speaker cabinets and effects, while the VGA-7 goes a step further by modeling guitars, pickups and tunings, thanks to its 13-pin "GK-Ready" input. And both amps feature bullet-proof construction, straightforward controls, and programmable memories–making them reliable, versatile, and ready for any gig you can throw at them.

The VGA-5 and VGA-7: Don't just look, play 'em and hear the future for yourself.

VGA-7

- COSM models of 20 vintage and modern tube, solid state and acoustic amps
- COSM guitar modeling simulates 26 electric, acoustic and hollow-body guitars
- Pickup type and position simulations with pickup blending capabilities
- Instant open and Nashville tunings, plus user-defined tunings
- Mind-bending effects processing
- 80 preset memories plus 80 user memories
- GK-Ready 13-pin input plus standard 1/4" guitar input

VGA-5

- Dynamic COSM models of 11 classic and modern amps, plus 11 speaker cabinets
- Onboard EFX section plus dedicated Delay, Chorus and Reverb processing
- Built-in Acoustic Guitar Simulator and Acoustic Amp model
- Tap Tempo control plus individual effects control via optional footpedals
- 10 User memories; 40 memories using optional GFC-50 Foot Controller

Roland

RolandUS.com

FaxBack information: (323) 890-3780
doc. #10473 (VGA-7), #10519 (VGA-5)

Our new hard disk recorder gives you 44 hours of uncompressed recording time.

Good luck.

Take a good look at the MRS-1044. Its power and simplicity bring the spontaneity back to digital recording. While you may not be able to see many of the dozens of features that make it so incredible, its greatest asset is the way they all fit together. It's the Zoom of desktop recorders.

No manual required: The MRS-1044's logical control surface makes it simple to record, edit and mix your songs. Large, logical controls and clear displays make it quick to get around with no learning curve. But just in case, the owner's manual it ships with is brilliant.

Bonding experience: Working with the MRS-1044 feels like working with tape. But each of its ten tracks is supported by ten virtual tracks. Auto punch and "easy bounce" allow you to combine and comp tracks with no generation loss. Then there's the familiar scrub control that lets you locate precise edit points with your ears. Scene memory and point markers make it even easier to get around.

It's a bridge: We're talking full MIDI capabilities together with digital audio. There are programmable stereo drums and bass on their own tracks. Their sound – *real.*

Personal effects: Process and sweeten the mix with legendary Zoom 24-bit digital effects, including EQ, Compression, Reverb, Chorus and even VAMS guitar amp modeling. There's also dedicated EQ on every channel.

It's well connected: The MRS-1044's open design provides enough ins and outs to satisfy any session. Phantom powered XLR balanced, 1/4 inch unbalanced inputs, stereo RCA analog outs, S/PDIF Optical out, MIDI and a slot for add-in SCSI and USB! No kidding.

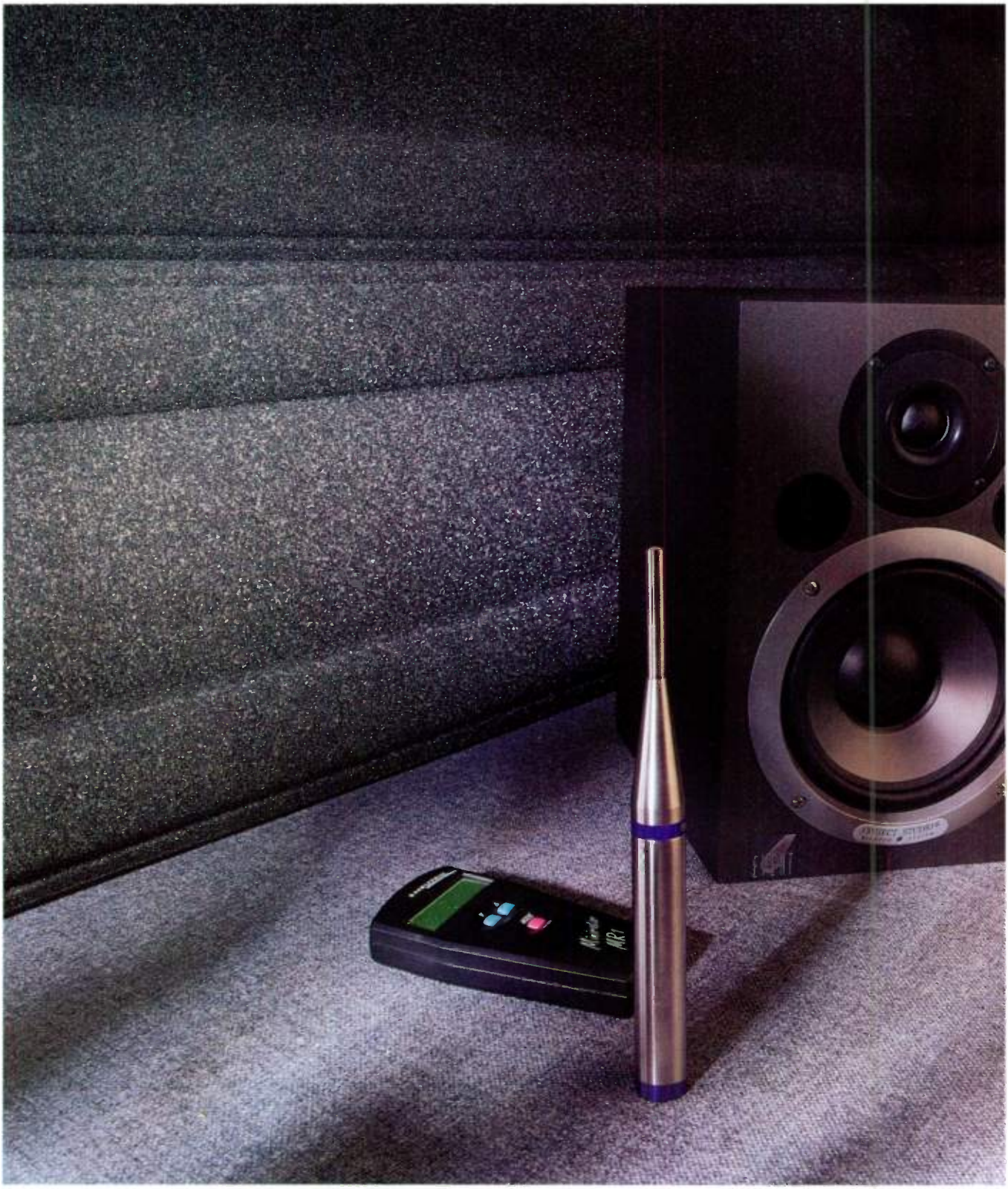
Zoom audio quality: The MRS-1044 gives you Zoom's legendary audio quality with remarkably smooth, clean 24-bit A/D and D/A converters and 44.1 kHz bit resolution.

More questions? Obviously there's more than we're telling you here but we think we've already got your attention. With the MRS-1044 all you'll need is inspiration. Good luck.

ZOOM®
CATCH US IF YOU CAN

The Zoom MRS-1044 MultiTrak Recording Studio

For more about Zoom, click to www.samsontech.com or email sales@samsontech.com • ©2001 Samson



PHOTOGRAPHY BY LESLIE HIRSCH

Truth or Consequences

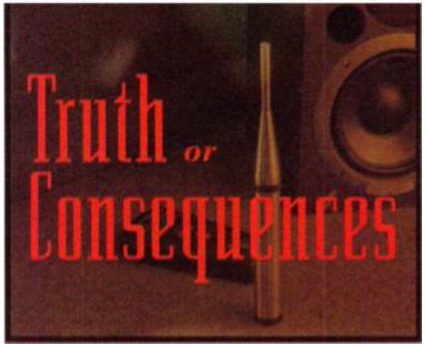
How to tune your control room for flatter frequency response.

I hate to be the one to break the news, but the control room you've grown to love is a saboteur and a liar. You had hoped that dressing it up with acoustical treatments and fancy reference monitors would make it tell you the truth about your mixes. But no—it continues to mislead you, doling out a confusing mix of weak and boomy frequencies that leave you wondering where the truth really lies.

This is not voluntary prevarication. It's in your control room's nature to lie. Even the best control rooms, in top-dollar studios, do not provide a completely flat frequency response throughout the room. That's because anywhere physical boundaries—walls, floors, and ceilings—exist, sound pressure will build up and break down at select frequencies, skewing the frequency response of the space contained within those boundaries. You want totally flat? Mix outdoors, with your monitors off the ground and pointing at the sky—and good luck staying in the sweet spot above them!

Don't misunderstand me: proper acoustical treatment and accurate monitors can go a long way toward giving you a trustworthy monitoring environment, and both are necessities for every control room. But they are not a cure-all. Most control rooms, particularly small ones, still need additional help to flatten out the frequency response.

By Michael Cooper



For the engineer in search of audio truth, the decisive finishing touch for the control room is electronic equalization. That entails running the mixer's control-room output signals through dual-channel parametric equalizers before sending them to the power amps and monitors in order to boost the room's weak frequencies and cut the boomy ones.

Purists may argue that electronic equalization is not a good solution (I foresee a truckload of angry letters coming my way!), and I agree that it's a compromise. The main shortcoming is that EQ can smooth out the frequency response only for people sitting in the sweet spot; those elsewhere in the room will likely hear an even more skewed response. I would rather have one spot in my control room that I know I can trust, where the frequency response is really accurate, than have every point throughout the room out of whack.

Frequency imbalances in control rooms can be so severe that resolving them with acoustical treatments alone is impractical—you'd have to install so much material (cylindrical bass traps, panel absorbers, and the like) in the room that little space would be left over for gear and people, and even then the problems might not be completely remedied. Room tuning with electronic EQ is therefore often a necessary evil. As long as you understand its limitations, it's also a pretty nifty solution to a vexing problem.

In this article, I will show you how to test and correct your control room's frequency response. I'll also point out pitfalls to watch for along the way. This is not meant to be an exhaustive survey of room-tuning techniques; rather, I'll focus on two approaches I have successfully employed: a simple, coarse, relatively inexpensive method I refer to as "Playing It by Ear" and, for Mac users, an exacting software-driven solution that I call "Heavy Artillery," which requires more time and expense.

Both methods require you to add a high-quality, dual-channel parametric equalizer to your monitoring setup (see the sidebar "Choosing a Room Equalizer"). In addition to the cost of the equalizer, both methods also necessitate the purchase (or rental) of some additional gear. Of course, you could instead use the money to hire a qualified acoustician to tune your control room for you. But making the investment and learning the techniques yourself offers some advantages; most notable is the ability to tune other rooms or your own should you acquire new speakers, remodel, or move your studio altogether. In addition, doing it yourself will give you personal satisfaction, not to mention an increased understanding of sound and acoustics.

Regardless of the method you choose, I recommend that you read both sections; a lot of information presented in the first section is critical to success in using either method.

WHY ROOMS MISBEHAVE

Before getting into the nitty-gritty, here's a closer look at the origins of the room-response problems you seek to correct. Imagine water flowing under a bridge: where the water hits the pylons, water pressure builds up. Likewise, sound pressure builds up where sound waves encounter hard barriers—walls, floors, ceilings, and other, smaller, surfaces.

You perceive the effects of that build-up as changes in loudness levels of particular frequencies at particular points in the room. The amount of change (whether boost or cut) and the frequencies at which it occurs derive largely from the room's dimensions. For example, frequencies with wavelengths twice as long as the length, width, or height of the control room will resonate considerably more than other frequencies. That happens because each reflection of the sound wave off of a room surface combines in phase with the last reflection—a phenomenon called *constructive interference*—causing a boost in amplitude. Depending on where you are in the room, you might hear a greatly exaggerated level at that frequency (because you're standing where a peak or trough occurs for the original and the reflected waveform) or very little level (because you're standing at a zero crossover point, a point in the room where an original and reflected waveform line up exactly in phase and have an amplitude of zero).

Those resonant waves, also called *standing waves* or *room modes*, are responsible for the tonal imbalances that plague virtually every control room. When you tune a control room with EQ, the goal is to compensate for the boosts and notches in frequency response that room modes cause so that the resulting response will be flatter.

Actually, room modes occur in a number of ways: by resonating between two opposing boundaries (whether two walls, floor and ceiling, or whatever, called

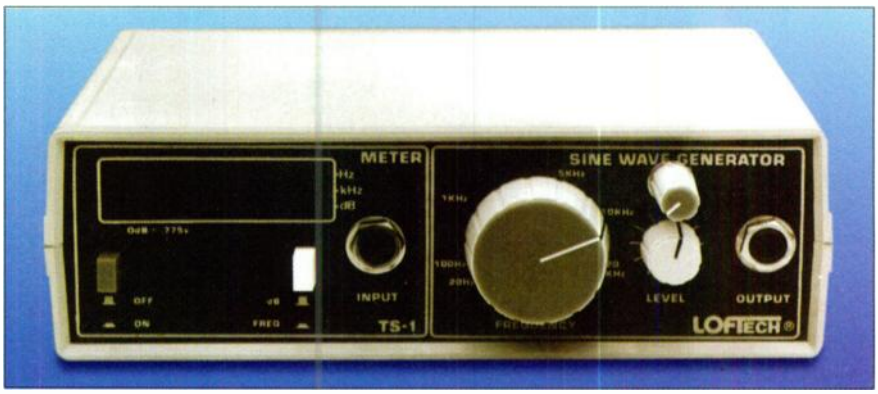


FIG. 1: The Gold Line TS-1 Audio Test Set provides a sine-wave oscillator, frequency counter, and level meter in one package.

THE 1604-VLZ PRO

or one of its VLZ PRO Series siblings with ultra-high headroom XDR mic preamps

CAN HELP YOU SOUND BETTER

assuming you practice once in a while and stay somewhat in tune most of the time.

Meet the industry standard for 16-channel mic/line mixers. Low noise. High head room. Superb mic preamps. The best tech support in the industry. And a solid ten-year track record of reliability.

Suh-weet-sounding 3-band EQ on every channel. Swept mid EQ has ultrawide 100Hz-8000Hz range.

Sealed rotary controls resist dirt, smoke and miscellaneous spooge.

Sharp cutoff filters cut stage rumble, mic stand clunks and P-pops without sacrificing bass.

Easy level setting. Maximize headroom and minimize noise quickly via Channel solo and Trim control. Up to 60dB of gain for boosting timid vocalists. –10dB "virtual pad" for toning down drummers.

Six aux sends per channel (four available at any one time). Two auxes are pre/post switchable.

Ultra-sensitive signal present LED on every channel lets you monitor inputs at a glance. **OL** LEDs, too.

Dust and smoke-resistant **logarithmic-taper 60mm faders** for accurate control and long wear.

Inside: **VLZ® design** minimizes thermal noise at key points in the circuitry. **Negative gain mix amp architecture** prevents overload when feeding all channels with hot inputs.

Control Room/Phones source matrix lets you create monitor mixes or remote feeds with any combination of the main mix, Subs 1 & 2, Subs 3 & 4 and tape inputs routed to separate bal./unbal. stereo outputs.

Separate **Tape to Main Mix switch** with independent level control.

Route Aux Return 3 to main mix, Subs 1 & 2 or Subs 3 & 4. Route Aux Return 4 to main mix or Control Room/Phones matrix only.

EFX to Monitor lets performers on stage hear a different level of effects than is in the main PA mix.

On the back: **sixteen premium XDR™ mic preamps.** Incredible 130dB dynamic headroom, ruler-flat frequency response, lower E.I.N. noise specs at working 0dB to +30dB gain levels and the best Radio Frequency Interference protection of any compact mixer on the market today.

1604-VLZ PRO

16 total chs. • 4-bus configuration • 16 XDR premium mic preamps • 16 mono mic/line channels • 3-band EQ with swept mid. 75Hz low cut filters and inserts on all chs. • 6 aux sends per ch. • 4 stereo aux returns with EFX to Monitor and bus routing options • Control Room/ Phones source matrix • 60mm log-taper faders • 3-way rotatable I/O pod for rack or table use

1642-VLZ PRO

16 total chs. • 4-bus w/double-bussed outputs • 10 XDR mic preamps • 8 mono mic/line level channels • 2 hybrid mono mic and mono/stereo line level channels • 2 mono/stereo line level chs. • 3-band EQ w/swept mid on mono channels & 4-band EQ on stereo channels • 75Hz low cut filters on mono chs. • 4 aux sends per ch. • 4 stereo aux returns with EFX to Monitor • Ctl Rm/ Phones matrix w/level controls • 60mm log-taper faders

1402-VLZ PRO

14 total channels • 6 XDR premium mic preamps • 6 mono mic/line level chs. • 4 mono/stereo line level chs. • Extra ALT 3-4 stereo bus • 3-band EQ • 75Hz low cut filters on mono chs. • 2 aux sends per ch. • 2 master stereo aux returns with EFX to Monitor • Ctl Rm/Phones source matrix • 60mm log-taper faders • Switchable AFL/PFL

1202-VLZ PRO

12 total channels • 4 XDR premium mic preamps • 4 mono mic/line level chs. • 4 mono/stereo line level chs. • Extra ALT 3-4 stereo bus • 3-band equalization • 75Hz low cut filters on mono chs. • 2 aux sends per ch. • 2 master stereo aux returns with EFX to Monitor • Ctl Rm/Phones source matrix • Rotary gain controls • Built-in power supply

Perfect match for the 1604-VLZ PRO: our SRM450 Active 2-way loudspeakers. Extreme output. Astonishing accuracy. Wide dispersion so your whole audience hears the same great sound.

for more information log onto
www.mackie.com
or call tollfree for a big brochure
800.258.6883

MACKIE

axial modes); four boundaries (*tangential modes*); or six boundaries (*oblique modes*). This article will focus only on axial modes, because they are the strongest of the three types and the only modes whose frequencies can be calculated using simple math.

SIMPLE EQUATION

If you know your control room's dimensions, you can predict the frequencies at which axial room modes will occur by using the following formula:

$$f = 1{,}130/2d$$

In the formula, *f* is the frequency of the mode measured in hertz, and *d* is a room dimension measured in feet. One thousand one-hundred thirty, in feet per second, is the approximate speed of sound at normal room temperature and humidity.

For example, a room that is 16.5 feet long will produce an axial mode at roughly 34.2 Hz (1,130/(2 × 16.5) = 34.24). That is the lowest-frequency axial mode that will resonate between the example room's front and rear walls. But axial modes will also occur at whole integer multiples of that fundamental frequency, that is, at 2 × 34.2 Hz = 68.4 Hz, at 3 × 34.2 Hz = 102.6 Hz, at 4 × 34.2 = 136.8 Hz, and so on.

Here's another example, this time for a control room that is 10.5 feet wide. Using the same formula, you can predict that axial modes will occur at 53.8 Hz, 107.6 Hz, 161.4 Hz, and so forth. The room height can also be plugged into the formula to calculate floor-to-ceiling axial modes.

Using the supplied formula, do the math for all three of your control room's dimensions—length, width, and height—and enter the results in a table. (See the table "Calculating Axial Modes" for an example.) When constructing the table, give each room dimension its own column for data entry. Calculate the fundamental or lowest-frequency room mode (f1) and whole integer multiples (f2, f3, f4, and so on) for each dimension and enter the results in rows in the table.

If your room has varying dimensions from wall to wall due to closets or alcoves, enter your results for each dimension in a separate column. Note, though, that you won't be able to use the formula for irregular constructions such as splayed walls or cathedral ceilings. Although rooms with such structural irregularities usually offer acoustical advantages, mathematically calculating their axial modes is not feasible, given the constantly varying dimensions. In the "Heavy Artillery" section, I'll discuss other methods for hunting down room modes in such spaces.

For reasons that go beyond the scope of this article, room modes greater than 300 Hz are not usually that problematic. You therefore need to calculate (and treat) only those that occur in the 20 to 300 Hz range; frequencies above that point should be left alone. In other words, the primary goal is to give the control room a really flat bass response.

When you finish entering the data in the table, look for common frequencies (those falling within 5 Hz of each other) in the columns and put them in parentheses for easy reference. Room modes that pile up at the same approximate frequencies are almost always the ones that cause the deepest notches and spikes in frequency response. You now should have a list of room modes for your room. Some will cry out for treatment; others will present less of a problem.

BASE PREPARATIONS

Before getting started, make sure that your monitor speakers are positioned properly to minimize acoustics-related problems and that you have chosen the position of your mix sweet spot carefully. Those matters are beyond the scope of this article, but they have a direct influence on the amount of equalization you need to flatten your room's bass response. Trying to use EQ to compensate for improper monitor placement is a

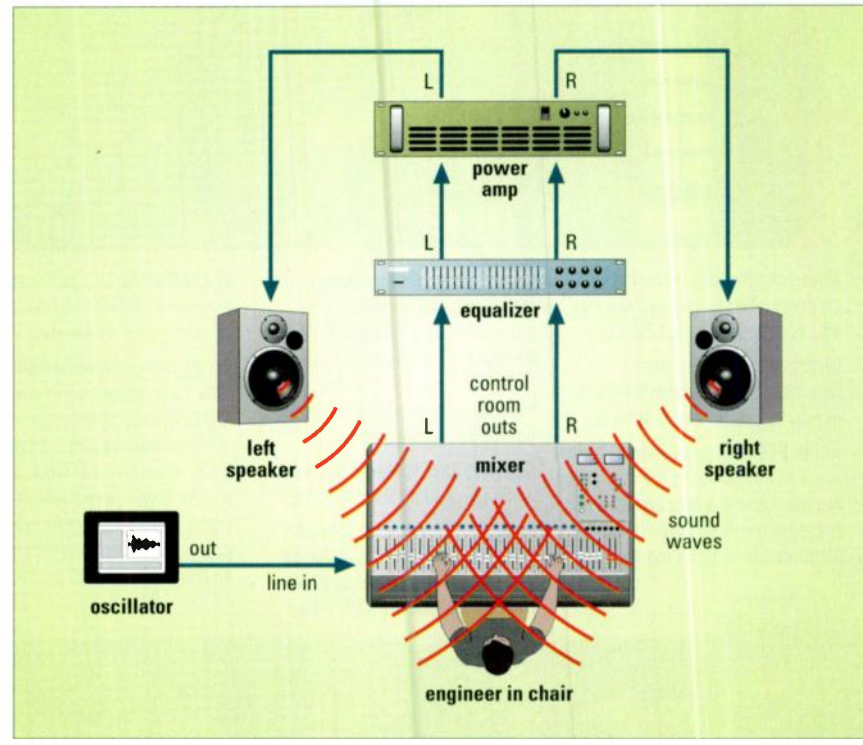


FIG. 2: The amount of gear needed for finding and correcting room modes by ear is modest. In addition to your standard mixdown setup, all you need is a sweepable sine-wave oscillator.

Spread some holiday cheer

Purchase a new Korg music workstation between September 15 and December 31, 2001 and receive $100 back from Korg. It's good for all new TRITON (including the TRITON Rack), Karma and Trinity workstations purchased from an authorized dealer.

It's just our way of making the season a little brighter.

After all, it is better to give than to receive.

KORG

* $100 HOLIDAY GIFT FROM KORG *

Fill out this coupon. Send it, along with a copy of your store receipt and completed warranty card, to: KORG USA, Attn: Korg $100 Offer, 316 South Service Road, Melville, NY 11747. Offer good on a new Trinity, TRITON or Karma workstation purchased between September 15, 2001 and December 31, 2001. KORG USA must receive all coupons, receipts and warranty cards by January 31, 2002. KORG

NAME

ADDRESS

CITY

STATE ZIP – PHONE NUMBER

E-MAIL

PRODUCT PURCHASED SERIAL NUMBER

PURCHASE DATE STORE

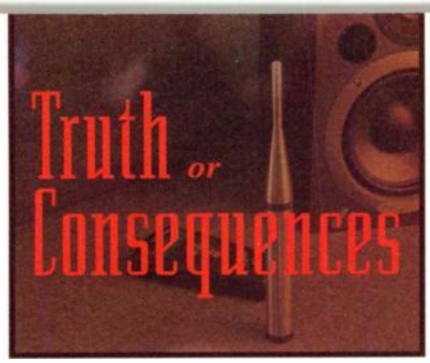
CITY STATE

STORE SALESMAN'S SIGNATURE

Only completed coupons will be honored. Offer good in the USA only. Void where prohibited by law. Offer subject to purchase verification by KORG USA. Please retain original sales slip. Rebate will be shipped directly from KORG USA. Please allow 4-6 weeks for delivery. Name on sales receipt must match name on rebate coupon. EM

©2001 Korg USA. For the Korg dealer nearest you: (800)335-0800. www.korg.com

WRH



losing battle. (For information about how to correctly position your monitors, see the sidebar "Now What?" in the June 2001 cover story, "Good References.")

Also, make sure your speakers are fitted with properly sized protective fuses before you proceed. Loud monitoring levels during testing or overzealous equalization boosts can cause speaker damage if your speakers are not protected. The problem is, you don't always know what's over the edge until you've fallen off the cliff, so both caution and fuses are warranted. If you're not sure what type of fuse to use for your speakers, ask the manufacturer.

Finally, use full-range speakers or a system with a correctly dialed-in subwoofer that is capable of reproducing frequencies as low as at least 40 Hz. If your monitors don't go that low, consult the specifications sheet to determine their 3 dB–down point on the low end and then simply don't attempt to equalize the room below that frequency. Applying massive amounts of EQ to speakers in an attempt to compensate for their inability to reproduce very low frequencies is a recipe for equipment damage (not to mention that it will skew your mixes).

PLAYING IT BY EAR

The simple method of finding and correcting room modes is somewhat inexact, but it can yield fairly good results for those not willing or able to commit to more technical forays. Still, you will need a sweepable sine-wave generator (commonly called an oscillator) for the procedure. The Gold Line TS-1 Audio Test Set ($469; see **Fig. 1**) is a good choice; it lets you manually sweep a sine wave across the entire audio spectrum with no changes in amplitude.

Refer to **Fig. 2** for the gear setup. Patch the output of the oscillator into your mixer's line input and route it at equal intensity (that is, panned dead center) to your L/R stereo bus. Next, patch the mixer's left and right control-room outputs through the parametric equalizer's left and right inputs, respectively. Make sure the equalizer is bypassed or set to flat response initially. Then, patch the L/R equalizer outputs through your power amp's corresponding I/O and, from there, to your left and right monitors (unless you're using powered monitors, in which case you patch the equalizer's outputs directly to the monitors' inputs).

If you wish to equalize two or more sets of monitors, you have two choices. The best solution is to equalize each pair of monitors using a separate dual-channel equalizer. In that case, you'll need a mixer that sports multiple pairs of control-room monitor outputs or you'll have to mult its single pair of control-room outputs at a patch bay before the equalizers.

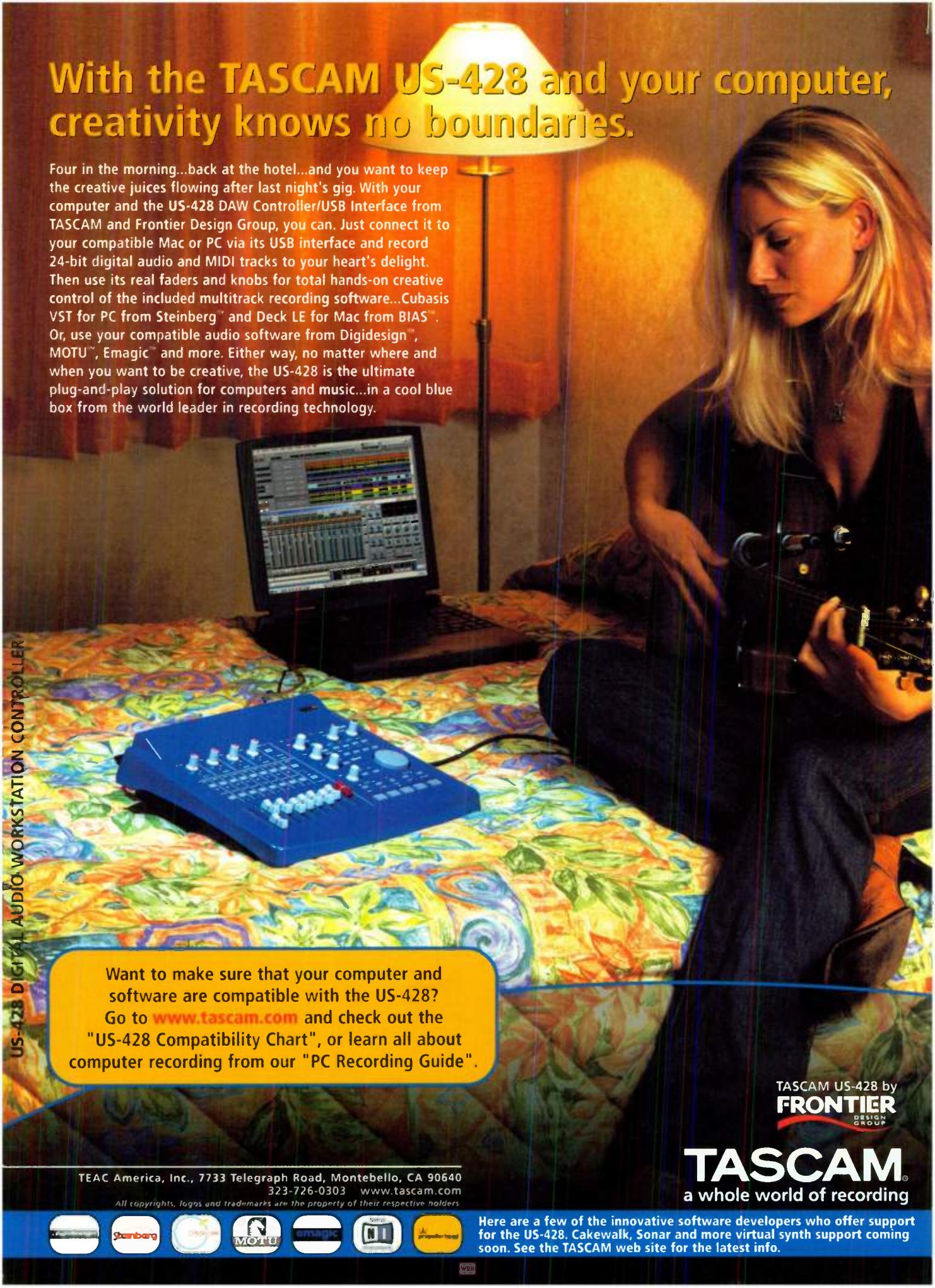

With the TASCAM US-428 and your computer, creativity knows no boundaries.
Four in the morning...back at the hotel...and you want to keep the creative juices flowing after last night's gig. With your computer and the US-428 DAW Controller/USB Interface from TASCAM and Frontier Design Group, you can. Just connect it to your compatible Mac or PC via its USB interface and record 24-bit digital audio and MIDI tracks to your heart's delight. Then use its real faders and knobs for total hands-on creative control of the included multitrack recording software...Cubasis VST for PC from Steinberg™ and Deck LE for Mac from BIAS™. Or, use your compatible audio software from Digidesign™, MOTU™, Emagic™ and more. Either way, no matter where and when you want to be creative, the US-428 is the ultimate plug-and-play solution for computers and music...in a cool blue box from the world leader in recording technology.
US-428 DIGITAL AUDIO WORKSTATION CONTROLLER
Want to make sure that your computer and software are compatible with the US-428? Go to www.tascam.com and check out the "US-428 Compatibility Chart", or learn all about computer recording from our "PC Recording Guide".
TASCAM US-428 by FRONTIER DESIGN GROUP
TASCAM
a whole world of recording
TEAC America, Inc., 7733 Telegraph Road, Montebello, CA 90640
323-726-0303 www.tascam.com
All copyrights, logos and trademarks are the property of their respective holders
Here are a few of the innovative software developers who offer support for the US-428. Cakewalk, Sonar and more virtual synth support coming soon. See the TASCAM web site for the latest info.

FIG. 4: The most affordable measurement microphone we know of, the Earthworks M30 delivers flat frequency response within 1 dB from 20 Hz to 20 kHz and time-coherent response from 9 Hz to 30 kHz.

A less desirable alternative is to perform the test procedures and equalizer setups with your main reference monitors and then use the same equalizer and settings for the additional pair or pairs of speakers. Granted, the equalizer settings for the main pair of monitors won't be ideal for the others, and the selected amounts of boost or cut probably won't be optimal, either; however, the approach will usually provide at least better-than-nothing results and sometimes quite noticeable improvements.

Once everything is properly routed, set the level of the sine-wave tone coming out of your speakers so that it's loud but not loud enough to hurt your ears. If you have a sound-level meter (I use the Radio Shack Digital-Display Sound-Level Meter; $59.99), you can be more exact and can adjust the monitoring level to approximately 80 to 85 dB SPL at the mix position. That is loud enough to excite room modes, yet quiet enough that it won't damage your hearing during short work periods. Even so, you shouldn't perform the following tests for more than 15 continuous minutes without taking a break.

I can't stress too much the importance of conducting the tests while sitting in the mix position. The conclusions you draw, and the corrections you make based on those conclusions, will be beneficial only if they are made from the sweet spot. The first thing, then, is to position the oscillator so that you can sweep its frequency comfortably while sitting in the mix position facing the monitors.

Begin the test with the sine-wave oscillator set to 20 Hz. Slowly sweep the frequency to ever higher frequencies while listening intently for changes in level intensity. When you hear the level dip or get louder, rock the oscillator's frequency control back and forth over that narrow band until you've dialed in the exact frequency at which the boost or cut in the room is the most dramatic. The frequency you dial in will probably correspond to that of one of the axial room modes you tabulated earlier. Refer to your written table to confirm that and to verify that you're on the right track. Make a note of the exact frequency at which you heard the problem in the room.

Repeat that procedure for higher frequencies. Once you reach 300 Hz, stop the test. Look at your table and notes and decide which three or four frequencies are the worst offenders. If your equalizer offers more than four bands per channel, you can treat more modes, but you'll probably discover more room modes than your parametric equalizer has bands to deal with. Because you can't treat them all, you must decide which are most in need of corrective EQ. Usually, the ones below 200 Hz are the most important to treat.

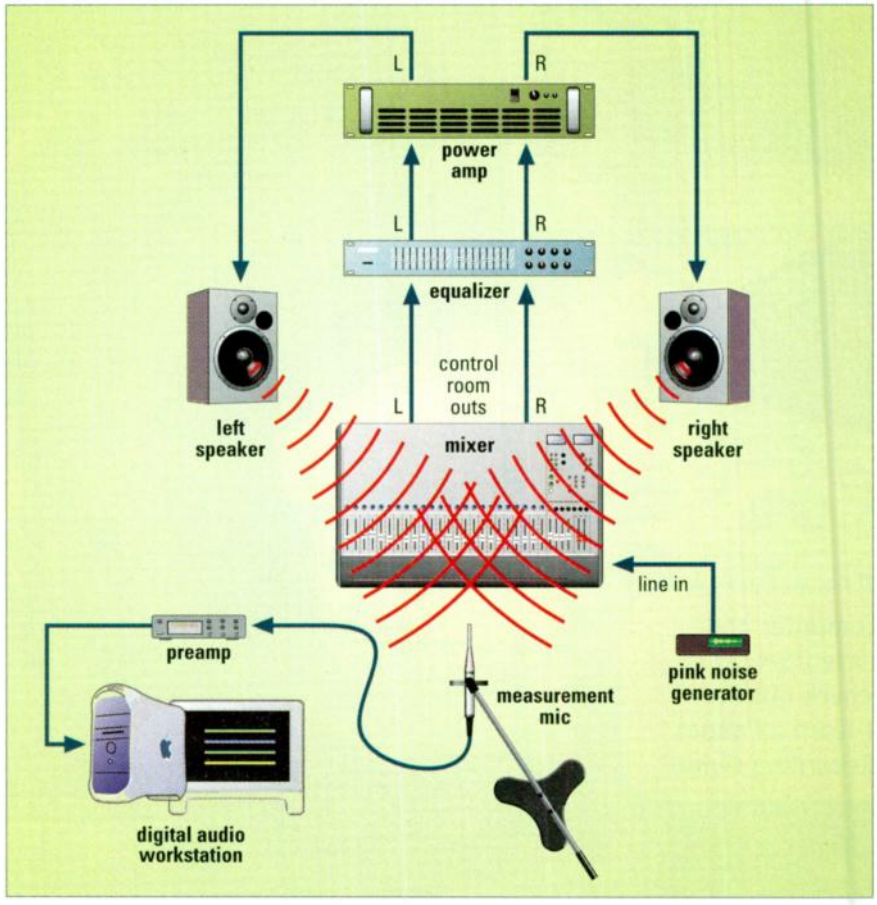


FIG. 3: Analyzing room modes with a DAW-based spectrograph requires routing pink noise through the monitors and capturing it with a measurement mic. The signal is then routed through a mic pre and an A/D converter into the DAW.

DOWN TO BUSINESS

Now treat the problem modes you pinpointed. First, engage band 1 on both channels of your equalizer (that is, make them active) and set the bandwidth

SO POWERFUL IT'S FRIGHTENING

PHOTO: STEVE SESKIS © 2001

CRAIG (#5) > SLIPKNOT

Don't let that nice smile fool you. Craig is one tough customer. Producing multitrack projects, original loops, sonic textures, sequences and samples for his band Slipknot is a demanding task. And doing it while on the road can be brutal. He needs a digital multitrack studio that can take a beating. That's why Craig uses SONAR™, the professional's choice for music production on the PC.

CHECK OUT SLIPKNOT'S LATEST RELEASE *IOWA* ON ROADRUNNER RECORDS, TO HEAR JUST WHAT IS POSSIBLE WITH SONAR, AND VISIT WWW.SLIPKNOT1.COM TO FIND OUT MORE ABOUT THIS AMAZING BAND.

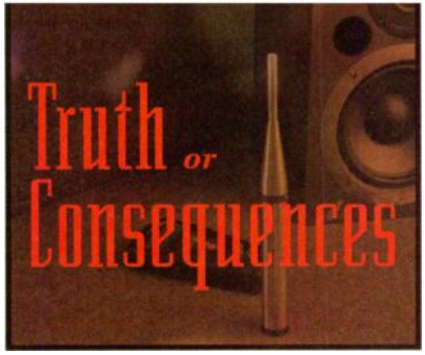
SONAR is the only software available that combines digital audio and MIDI recording, audio looping, DXI software synths, and automatable DirectX audio effects into a seamless music production system. Designed by Cakewalk, the leaders in Windows audio technology for over ten years.

SONAR™

DXi

SONAR is available at music retailers worldwide.
Find out more at www.cakewalk.com/SONAR or call 888.CAKEWALK (617.423.9004 outside U.S.).

cakewalk®



controls to the narrowest settings. Park the oscillator on the lowest frequency you want to treat and then set the L/R channel frequencies for band 1 on the equalizer to that same frequency. Next, either boost or cut to neutralize the room mode. That can be an inexact process because most equalizers don't provide numerical readouts for setting center frequencies for the bands. You therefore initially need to apply overkill amounts of EQ boost or cut, which will be clearly audible, and then sweep back and forth with the band's center-frequency control until you find the setting that best counteracts the effect of the room mode.

If the mode causes a notch at the mix position, turn the monitoring level way down. Boost band 1 of the equalizer at least 10 dB at the outset so that you can clearly hear its effect; you don't want to damage your speakers or hearing in the process. With band 1 boosted at least 10 dB, slowly sweep its frequency control over the range in which the oscillator is fixed. When you hear the room mode increase in level (the effect of the notch diminishes), band 1 is set to that room mode's frequency.

Now, reduce band 1's boost to a reasonable level, about 6 dB, and bring up your monitoring level so you can hear more subtle tweaks. Again, rock the oscillator's frequency control back and forth over the room mode's frequency. Does the sound still dip in level at that frequency (compared with neighboring frequencies)? If so, increase the equalizer's band 1 boost a bit. Conversely, if the 6 dB of boost you provide are too much, you'll hear a boost instead of a dip at the room-mode frequency, and you should reduce band 1's boost. Each time you make an adjustment to the equalizer's boost, sweep the oscillator over the offending tone to judge the results. When the level is consistent with that of surrounding frequencies, the room mode is equalized.

An important point: in most cases, you will not want to boost more than 6 to 8 dB in any particular band to correct deep notches. Excessive amounts of EQ boost will quickly eat up your monitoring system's headroom, causing an increase in distortion. You should adjust your equalizer's input and output levels to prevent the equalizer, power amp, and speakers from clipping. But often it is preferable to only partially correct a deep notch and then learn to live with the remaining dip.

Use a similar technique to correct modal spikes in your control room. Set band 1's boost/cut for maximum cut and sweep the equalizer's frequency control over the range in which the spike

CHOOSING A ROOM EQUALIZER

Room modes typically cause narrow-band notches and spikes in frequency response, requiring you to treat them with surgical precision. For that reason, only a parametric equalizer can provide satisfactory results in room-tuning applications. A parametric equalizer lets you control the bandwidth or Q of each equalizer band to within a fraction of an octave, enabling you to correct notches and spikes in response without affecting neighboring frequencies much. Graphic and other types of equalizers typically have too broad an influence to zero in on problem frequencies and thus should not be used to tune your room.

Both left and right monitors need to be equalized, so it's also imperative that the equalizer be a dual-channel unit. Furthermore, it should have independent sets of controls for each channel. Although more often than not the EQ should be applied evenly to both sides, an asymmetrical room or a monitoring setup with one speaker closer to a wall than the other may require that you dial in different equalizer settings for the left and right channels.

Ideally, your parametric equalizer should offer at least four bands per channel, with enough frequency-range overlap that at least three bands can simultaneously be tuned to frequencies below 200 Hz. A unit that offers additional high and low shelving or high- and lowpass filters is especially valuable. That's because problems that occur in rooms at high- and low-frequency extremes often require relatively broad-band tweaking rather than narrow-band.

Look for an equalizer that offers continuously variable center-frequency sweeping for each band (so that you can tune in to the exact frequency you need to treat) and narrow Q control (down to at least 1/10- or 1/12-octave bandwidth) for each of its bands. Also, each band should be able to provide 12 dB boost or cut (though 6 dB is often all you need).

In general, go for the highest-quality equalizer you can afford, because usually, the higher the quality, the less group delay (progressive phase shift with rising frequency) the unit will exhibit and the better it will sound. Cutting corners is not advisable, because you'll be making mix decisions based on what you hear pumping through your equalized monitors. You don't need to fork over several thousand dollars for the most pristine EQ available, but do shoot for at least a midpriced unit. Two models that provide excellent flexibility and high-quality results are the TC Electronic TC 2240 ($1,288) and the Klark Teknik DN410 ($1,838). I have also heard good reports about the Symetrix 552E ($749), though I have not tested or used that model myself.

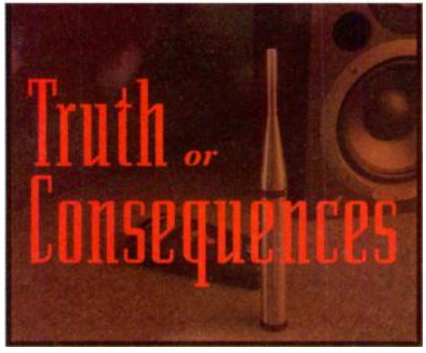
THE WORLD'S #1 SELLING STUDIO MIC

If you need a good reason to buy a RØDE NT1 – apart from its proven performance, competitive pricing and superior sound quality, then we will give you one. The RØDE NT1 is now available for a limited time only with a FREE shock mount.

FREE SHOCKMOUNT

RØDE®
MICROPHONES

USA Tel: 310 328 7456 INTERNATIONAL Tel: 61 2 8765 9333 Fax: 61 2 8765 9444 info@rodemicrophones.com www.rodemicrophones.com JBC/ROD2955EM



resides. When you hear the oscillator's tone go down in level, the equalizer's frequency control is set correctly. Next, repeatedly adjust the amount of EQ cut, sweeping the oscillator's frequency after each adjustment until the offending frequency no longer spikes in relation to surrounding frequencies. Feel free to apply more than 8 dB of EQ cut to correct a spike, as it will not compromise system headroom.

If after making EQ adjustments you find that a dip or a spike persists but occurs over a narrower range, try slightly increasing the equalizer's bandwidth control for the affected band. In many cases, however, that will not be an issue, and you'll want to keep the equalizer's bandwidth controls at their narrowest settings.

Symmetrical rooms with symmetrical speaker setups typically require mirror-image equalizer-control settings for both channels. On the other hand, asymmetrical rooms or asymmetrical setups may require slightly different boost/cut settings on different channels for the same band. If that's the case, pan your mixer's control room output completely left to make boost or cut adjustments for the left speaker and completely right to adjust for the right speaker.

You might also be tempted to treat certain frequencies differently from one speaker to the next to compensate, for example, for different room modes getting excited because the two monitors are set up at different distances from nearby walls. Typically, though, that is best avoided; focus instead on correcting modes common to both channels.

Once you tame the lowest offending frequency in your room, repeat the entire process for the other modes using the other available bands on the equalizer. When you finish, all treated bands should sound quite flat at the mix position. Nonetheless, the subjective nature of this test procedure makes it inaccurate as compared with the software-driven approach I will cover next.

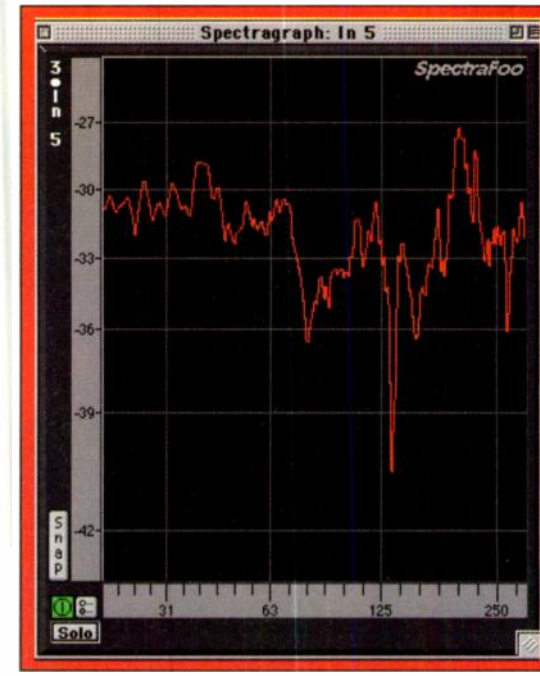


FIG. 5: Metric Halo *SpectraFoo* and *SpectraFoo Complete* feature a spectrograph function that clearly reveals room modes at a glance. The window shown plots frequency on the *x*-axis and amplitude on the *y*-axis, here revealing a severe notch at about 130 Hz.

HEAVY ARTILLERY

The most accurate method for tuning a control room requires four pieces of gear: a pink-noise generator; a measurement microphone; a high-quality, neutral-sounding mic preamp; and equipment that can provide a spectrograph function. A spectrograph shows the frequency response of a signal by plotting its frequency versus its amplitude. A high-quality spectrograph will clearly show notches and spikes in your control room's frequency response.

Fig. 3 shows the proper setup for using the gear. First, patch the output of the pink-noise generator through your mixer to your monitoring system. Make sure the room equalizer is initially bypassed or set to flat response. Set up the measurement microphone precisely at the mix position sweet spot to capture the pink noise emanating from the monitors so that it can be analyzed and displayed by the spectrograph. Although any small-diaphragm, omnidirectional, flat-response condenser mic with extended lows and highs can do a good job of capturing your room's response, a purpose-built measurement mic gives the most accurate results. I use the Earthworks M30 ($500; see **Fig. 4**), which is an exceptionally accurate and affordable measurement mic.

Patch the output of the test measurement mic through the mic preamp and route the output of the mic pre to the spectrograph's input. I use a digital audio workstation (DAW)–based spectrograph application—a far more affordable solution than an audio test kit—and route the mic preamp's output into the computer with an Apogee Rosetta A/D converter to get an accurate audio capture. If you use a DAW-based spectrograph, set input levels at

MANUFACTURER CONTACT INFORMATION

Earthworks
tel. (603) 654-6427
e-mail earthwks@jlc.net
Web www.earthwks.com
Gold Line
tel. (203) 938-2588
e-mail sales@gold-line.com
Web www.gold-line.com
Klark Teknik
tel. (952) 887-7444
e-mail adam.grath@telex.com
Web www.klarkteknik.com
Metric Halo
tel. (845) 831-8600
e-mail in-foo@mhlabs.com
Web www.mhlabs.com
TC Electronic
tel. (805) 373-1828
e-mail tcus@tcelectronic.com
Web www.tcelectronic.com

the A/D for a healthy –1 dBFS reading inside your DAW.

I highly recommend the Macintosh-based Metric Halo *SpectraFoo Complete Radical* 3 ($800) software program for its spectrograph function (see **Fig. 5**). Although some other Mac-based applications also offer a spectrograph function, *SpectraFoo* blows them all away by allowing you to see notches and spikes as narrow as ⅛ Hz. Metric Halo also offers a lite version, dubbed simply *SpectraFoo,* that costs only $400 and provides a spectrograph function too. Both versions of *SpectraFoo* can operate in standalone mode or as a plug-in for TDM, Real Time AudioSuite (RTAS), and MAS host applications. They require a PowerPC running Mac OS 7.5.3 or better and 6 MB of RAM.

Now you're ready to embark on your search-and-destroy mission for room modes. Get the pink noise cranking through your monitors at about 85 dB SPL and put on a pair headphones, with no input signal, to protect your ears from the obnoxious noise blasting away in the room. Zoom *SpectraFoo* down to the 20 to 300 Hz region (remember, that is the only range you're treating) and watch its spectrograph-function display for notches and spikes in the frequency response.

Refer to the table of axial modes you prepared earlier to confirm you're on the right track. Again, pick the three or four worst offending frequencies (the ones with the deepest notches and tallest spikes in the spectrograph display) to treat.

Switch to band 1 on both channels of the equalizer and set the bandwidth controls to their narrowest settings. Go after the lowest-frequency room mode on your hit list first. You know the drill: for taming a notch, crank the equalizer's boost/cut controls by 10 dB or more and sweep the center-frequency control through the band where *SpectraFoo* tells you that the notch resides. This time, though, let your eyes, rather than your ears, tell you when you have the frequency dialed in. As your equalizer's frequency-control knob approaches and then locks into the offending frequency, you'll see the notch start to decrease in depth in real time and then, hopefully, disappear altogether as the frequency response flattens. Once you have the frequency dialed in, fine-tune the amount of boost/cut for the flattest response. Remember that you don't want to exceed 6 to 8 dB of boost in

Now Shipping...
The New Standard in Sample Libraries
Garritan
Orchestral Strings
Quality ... Choices ... Control
"... the most comprehensive and realistic sounding string library." Danny Lux, TV/Film Composer (Ally McBeal, Boston Public, Profiler)
"Groundbreaking! The sheer amount of expression and range of articulations is amazing." Robert Kral, TV/Film composer (Angel, Sliders)
"... the closest representation of a true string orchestra ...The variety is unequalled ...." David Schwartz, TV/Film Composer (Wolf Lake, Northern Exposure)
"These are the most expressive sampled strings I have ever heard." Chris Beck, Emmy Award winning TV/Film composer (Buffy the Vampire Slayer, Bring It On)
Featuring:
- 16 CD-ROM Chromatically Sampled String Ensemble Library (DVD Available) with over 8,500 Samples
- Sampled String Instruments Include Stradivarius, Guarneri, Montagnana, Testore, Gagliano and other Exceptionally Fine Violins, Violas, Celli & Double Basses - Recorded at Lincoln Center
- Comprehensive Articulations & Bowings A Myriad of Playing Techniques & Effects - Marcato, Sautillé, Sordino, Slides, etc. - Over 500 Patches Up to Four Dynamic Levels Sampled
- Superior Control - Expression, Dynamics, Warmth, Length, Vibrato and Other Controllers. A Truly 'Musical', 'Expressive' and 'Playable' Library
- MaestroTools Legato Mode - An Exclusive Feature to Achieve Realistic Legato Phrasing.
- MaestroTools "Auto-Alternator" - An Exclusive Feature Alternate Automatically between Up & Down Bows
- Key Switching - Allows for Easy and Quick Selection of Various String Articulations at the Touch of a Key
- Orchestral Strings is Flexible Enough to Play Runs, Arpeggios & other Ornamented Phrases
- GigaStudio® & Akai Format - Other Formats Soon
For more information:
www.garritan.com
(360)-376-5766
e-mail: gary@harps.com
Visit our website for more detailed information

most cases, or your system headroom will likely suffer.

If the lowest-frequency room mode produces a spike, adjust band 1 for maximum cut. Sweep the equalizer's frequency control until the spike is affected and then adjust the amount of cut for the flattest response. Once you tame the first room mode, activate each remaining equalizer band in turn (going from lowest to highest) and "tune out" the other modes using the same procedure.

After doing all you can using the spectrograph, listen to some CDs in your control room and further fine-tune the equalizer settings by ear. Measurements do not always guide you toward the most musical results, so you might feel that an additional boost or cut is called for in one or two bands. I rely strictly on *SpectraFoo* for determining the exact frequencies to treat, but I fine-tune the amount of boost or cut by ear.

DON'T TOUCH ME

As mentioned previously, room modes that occur above 300 Hz are not nearly as detrimental to your subjective monitoring experience as those below 300 Hz. That's one reason not to bother hunting down and treating modes that lie above 300 Hz.

But there's another reason. Most equalizers cause significant phase shift, which can make the music you're monitoring sound harsh. Fortunately, the effects of phase shift are not that audible at the extreme ends of the audio spectrum, so when you correct bass-region room modes with EQ, you should not hear any phase-based degradation in the sound quality. It's when you begin mucking around in midrange and higher frequencies, at which the ear is most sensitive to phase anomalies, that you get into trouble. You could, for example, find yourself forever chasing after a warmer mix because of compromised monitoring produced by the phase problems you introduced with EQ.

To correct imbalances in your control room not caused by room modes, try using any low- and high-shelving EQ your equalizer offers. For instance, a rigid rear wall (often caused by being fastened too securely to the floor) can create an increase in response below 50 Hz in a control room. (In such a case, I don't recommend loosening any wall-to-floor screws, because the floor might creak.) You could smooth out that response problem by cutting with a little bit of low-frequency shelving. However, some experts recommend using shelving EQ for that purpose only if the equalizer employs first- and second-order filters (as opposed to third- and fourth-order filters).

Likewise, if you have a small control room with heavy carpeting and a lot of absorbent acoustics at the room's front end and problems with imaging or comb filtering prevent you from livening up the room by removing acoustic treatments, a small amount of high-frequency shelving boost can bring some air back into the control-room sound. Just make sure to boost no more than a few decibels and leave frequencies below 10 kHz untouched. That means setting the high-shelving corner frequency considerably higher than 10 kHz. Excessive boosting will make the high end sound noticeably harsh, so be conservative.

SWEET SPOT

Room equalization is an invaluable tool for whipping a stubborn room into shape. You'll be surprised what a difference correcting only three or four room modes will make, both in the accuracy of your mixes and in your enjoyment of music.

Like any quest for perfection, the search for a monitoring environment with perfectly flat frequency response is necessarily doomed—no matter how well the room is designed or how well you implement corrections, "perfectly flat" remains an ideal, not an achievable goal. Just the same, it is a goal worth pursuing, and hopefully, this article has armed you with the information and techniques for doing so. ●

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

CALCULATING AXIAL MODES

To make a record of room modes you would expect to encounter in a room of known dimensions, draw up a table containing a separate column for room length, width, and height. Using the formula f = 1130/2d (explained on p. 66), calculate the fundamental or lowest-frequency room mode (f1) and whole integer multiples (f2, f3, f4, and so on) for each dimension. Then, enter those figures in rows in the table. You only need to tabulate frequencies as high as 300 Hz.

The table below shows room modes for a room that is 16.5 feet long, 10.5 feet wide, and 7.7 feet high. Any frequency within 5 Hz of another frequency is shown in parentheses to denote the potentially worst modes. Here, the four worst modes occur between 68 and 73 Hz, 102 and 107 Hz, 215 and 220 Hz, and 269 and 273 Hz.

Mode	Hz for L = 16.5 ft.	Hz for W = 10.5 ft.	Hz for H = 7.7 ft.
f1	34.2	53.8	(73.4)
f2	(68.5)	(107.6)	146.8
f3	(102.6)	161.4	(220.2)
f4	137.0	(215.2)	293.6
f5	17.0	(269.0)	>300.0
f6	205.2	>300.0	>300.0
f7	239.4	>300.0	>300.0
f8	(273.6)	>300.0	>300.0

- 8 voice polyphonic sound source at a killer price
- 12 band vocoder
- 25 Knobs that transmit MIDI for instant control
- Stereo inputs, outputs for processing of outboard equipment
- Powerful arpeggiator
- Superb Liquid Analog Sound
- Quality effects: reverb, chorus, delay, sync'd panning & distortion

You don't want much do you? Stellar sound, masses of features, flexibility, versatility.

A genuine Novation poly-synth for less than seven hundred bucks.

Well you can have it. All.

The new A-station is a fully controllable 8 voice polyphonic synth featuring lots of knobs, a 12 band vocoder, stereo I/O, powerful arpeggiator and, of course, genuine Novation Liquid Analog Sound. And all for $699.00.

What else do you want?

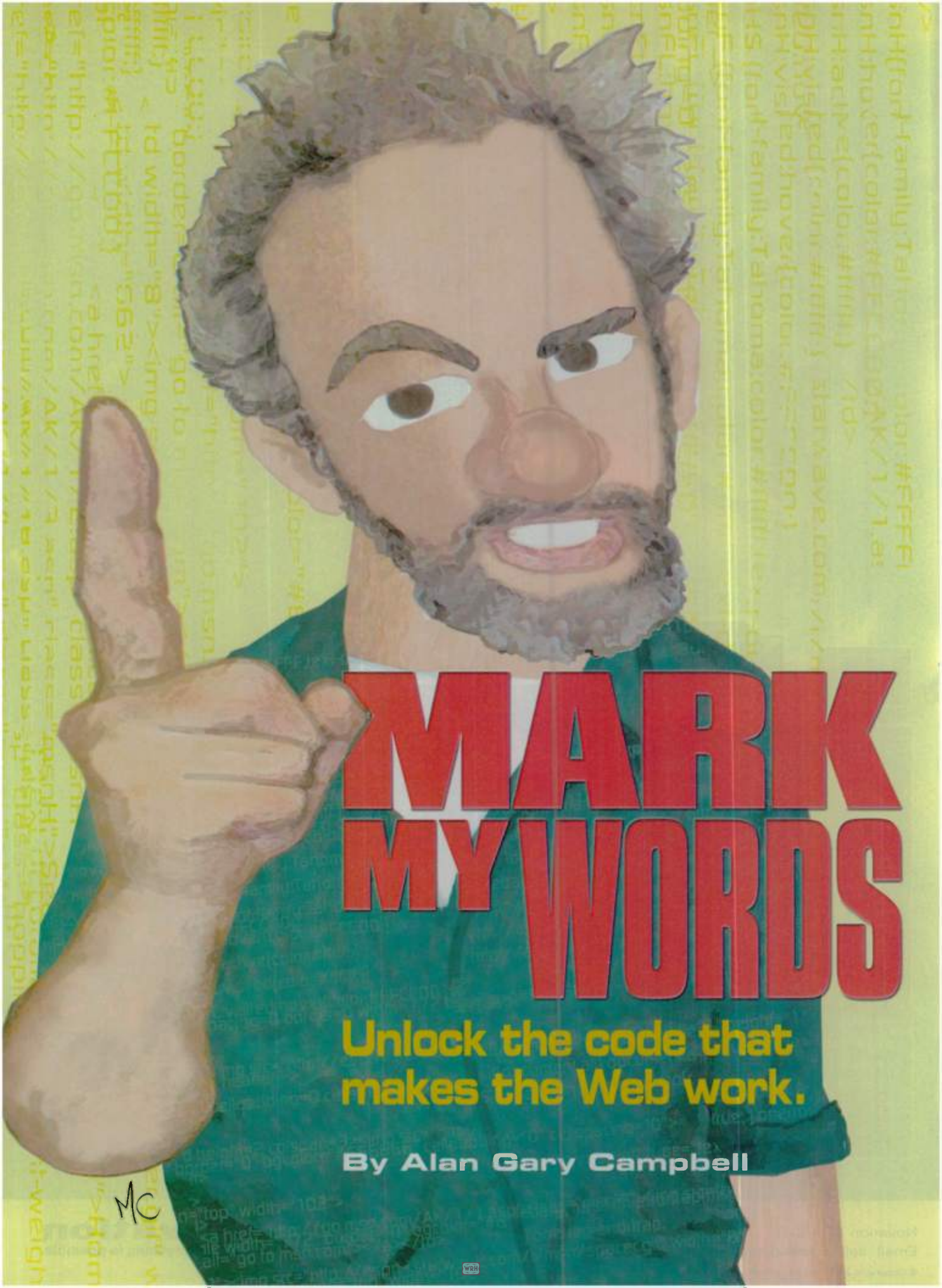
Control freaks stop here.

Novation USA LTD.
Email: salesusa@novationmusic.com

www.novationmusic.com

novation
In music, anything is possible.

© Copyright 2001. All trademarks are the property of their respective owners. E&OE.


MARK MY WORDS
Unlock the code that makes the Web work.
By Alan Gary Campbell
MC

You have the band's home page up. The counter works. You've even sold some CDs. You're about to breathe a sigh of relief, but then you sense them coming: XHTML, XML, WML, VRML. It's the invasion of the markup languages! Should you run? Should you hide? Should you take a correspondence course?

Never fear. I'll show you how to tame the tsunami of tag-based technology and give you working examples that you can try. Not all markup languages are equally important to musicians, so I'll start with the most significant ones. I'll also include some more esoteric languages that could become important in the future.

WHAT IS A MARKUP LANGUAGE, ANYWAY?

Markup is a way to add indications to plain text that tell a computer what the text means (for example, a title, a heading, or a paragraph) or how it should look when it's printed or viewed on a video display. Unlike the text, the markup itself isn't displayed. Markup was first used in typesetting; the cryptic snippets between squiggles seen on a Linotype machine are markup.

If you've created a home page, you probably already know this markup:

```
<B>Bold</B>
```

It tells a Web browser to render the word *bold* in, well, bold. A markup instruction, commonly referred to as a *tag*, is typically enclosed between angle brackets, as seen in the example. Most tags come in pairs—a start and an end tag. A whole set of tags is a markup language.

Standardized Generalized Markup Language (SGML) is a powerful master language for defining markup. SGML has abilities beyond normal markup. It's the realm of markup scientists; you won't encounter it directly. SGML is the parent of the most famous markup language of all, HTML.

HTML, RULER OF THE WEB

HTML, or HyperText Markup Language, was created in the early 1990s from SGML so researchers could share information on networks, and later on the Web, more easily. (At that point, MP3, Yahoo, and eBay were figments of the imagination.) HTML was meant to be easy to use and be compatible with different browsers but still provide powerful features. Look at the following basic HTML example:

```
<HTML>

<HEAD>
<TITLE>Markup Languages for Electronic Musicians</TITLE>
</HEAD>

<BODY BGCOLOR=#FFFFFF TEXT=#000000 LINK=#0000FF
VLINK=#0000FF ALINK=#999999>
<H1>Markup Languages for Electronic Musicians</H1>
<IMG SRC="e-musician.gif" alt="Electronic Musician logo"
border=0 WIDTH=200 HEIGHT=40><BR>
<BR>
<P>
<A HREF="http://www.yahoo.com/">A Link to Yahoo!'s Home
Page</A>
</P>
</BODY>

</HTML>
```

The <HTML> and </HTML> tags define the start and end of the document and tell a browser that this is HTML. The <HEAD> and </HEAD> tags define information that the browser needs to understand before it displays the page. In this case, I provided a page title to display in the browser's title bar. The <BODY> and </BODY> tags define the information that will be displayed on the page. The <H1> and </H1> tags define a heading (typically rendered by a browser in a large bold font). The <IMG> tag defines an in-line image (in this case, EM's logo). The <BR> tag provides a line break. The <P> and </P> tags define a paragraph. The <A> and </A> tags define a hyperlink to another Web page (Yahoo's home page).

Note that several tags have additional information inside the tag delimiters (the angle brackets). Those bits of information are called *attributes*. The <BODY> tag has attributes for the text and link colors, and the <IMG> tag includes attributes for descriptive text and for the image border width and image size. Different tags allow different attributes, though not all Web browsers understand all attributes.

There are many other tags and attributes that you might want to use. Nonetheless, even basic HTML features such as in-line images and hyperlinks can provide a great deal of information to the user, which is one reason why HTML has gained such wide acceptance.

If you've experimented with HTML before, that is probably familiar stuff. But did you know that other kinds of markup can display the same information on all kinds of devices?

Illustration by Mike Cruz

MARK MY WORDS

WAP: GOING WIRELESS

Wireless Web technology is a hot topic these days because it promises to deliver rich Web content to handheld devices such as cell phones and personal digital assistants (PDAs). Wireless Application Protocol (WAP) is a set of standards that describes how wireless devices are supposed to communicate. Unfortunately, most wireless providers have failed to deliver useful and engaging content, leading to mass consumer discontent that detractors have dubbed *Waplash*. Does that mean something is wrong with WAP? No! Even base-model Web-enabled cell phones, such as Sprint's Touchpoint, have intuitive navigation, good performance, and can display WAP graphics as well as text. Moreover, fast wireless connections are under development, along with the ability to download and store multimedia files, such as MP3s, to your phone. (Some U.S. cell phones double as MP3 players, but expect cutting-edge gear to arrive in Europe first, where conventional Internet connectivity is comparatively expensive.)

Adding WAP-capable pages to your site is easy, but there's a catch. Deploying WAP means deploying at least two kinds of markup, one for each type of Web-enabled phone.

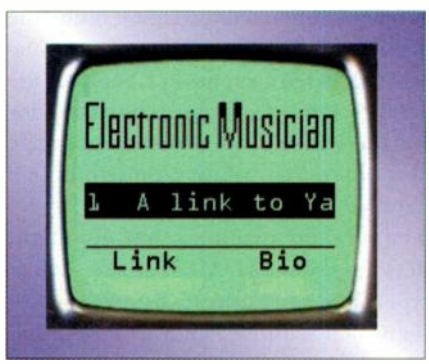


FIG. 1: HDML is not the newest markup language, but it is compatible with a large number of cell phones in the United States. Here is the HDML version of the test page as displayed on a cell phone.

The first is the Handheld Device Markup Language (HDML). HDML is an older markup for handheld devices that is somewhat limited in scope but is optimized for the technology in U.S. phones. It doesn't look like HTML, except superficially. Unlike an HTML page, an HDML page isn't based on a document, with familiar head and body elements, but on a *deck*, wherein each related HDML page is called a *card*, much like a stack of 3-by-5 index cards. That concept may seem a bit strange, but it's fairly intuitive once you get used to it. Common HDML cards include the Display card, used to display images and text, and the Choice card, which shows a choice of *tasks*, such as links to other HDML cards (a Choice card can also reveal an image or brief text). Here's the home-page example in equivalent HDML, based on a Choice card:

```
<HDML VERSION=3.0 MARKABLE=TRUE>
<CHOICE TITLE="Markup Languages for
Electronic Musicians">
<ACTION TYPE=SOFT1 TASK=GO
DEST=bio.hdml LABEL=Bio>
<ACTION TYPE=HELP TASK=GO
DEST=help.hdml>
<IMG SRC=e-musician.bmp alt=e-musician>
<CE TASK=GO
DEST=http://www.yahoo.com/
LABEL=Link>A Link to Yahoo's Home Page
</CHOICE>
</HDML>
```

The <CE> (Choice Entry) tag defines a single task: the link to Yahoo's home page. (On a phone display, a long link title such as this will autoscroll from left to right to conserve screen space.) You can have as many as ten <CE> tags on a Choice card; the HDML browser numbers them automatically. For phones that display text captions, the Label attribute value is shown when you select the associated task. The Action tags allow you to control additional phone functions, based on the supplied attributes. The Type=Soft1 attribute allows you to assign a card and caption to the phone's primary "soft button" (here I linked to a theoretical author bio), and the Type=Help attribute lets you replace the phone's Help menu with your own. **Fig. 1** shows how that looks on a generic cell phone.

HDML is pretty useful, but it isn't part of the WAP specification, and Unwired Planet, the company that developed it and that supplies browsers for most Web-enabled U.S. phones, has switched to WAP. WAP incorporates Wireless Markup Language (WML), which is more like HTML. But many Web-enabled

WEBLIOGRAPHY

The Web offers vast resources about markup languages. Here's a sampling:

discML
www.discML.com

HDML Language Reference
http://developer.openwave.com/ja/htmldoc/331h/hdmlref/

Introduction to VRML
http://home.netscape.com/eng/live3d/intro_vrml.html

Introduction to XHTML
www.wdvl.com/Authoring/Languages/XML/XHTML/

Mobilizing the Web with HDML
www.webreview.com/1998/10_09/webauthors/10_09_98_5.shtml

Online WBMP converter
www.teraflops.com/wbmp/

WAPDrive
www.wapdrive.com

WAP/WML School
www.w3schools.com/wap/default.asp

XML 101
www.xml101.com/xml/default.asp

XML FAQ
www.ucc.ie/xml/

((DON'T BELIEVE EVERYTHING YOU HEAR.))

COMING SOON: fully digital bi-amped front end

((UNLESS, OF COURSE, YOU'VE HEARD IT FROM A KRK STUDIO MONITOR.))

Top engineers and producers know that KRK studio monitors still give you the truest, most natural mix around. And with our V series, the fact is KRK has never sounded better.

KRK Systems, LLC

But as we said - don't believe everything you hear. See your local KRK retailer and listen to the true sound of your mix from one of our new advanced studio reference monitors today.

THE V SERIES
OF SELF-POWERED BI-AMPED MONITORS

V6
Big Sound in a small package, plus built-in crossover and video shielding

THE NEW V88
More low frequencies, and more SPL thanks to twin 8" woofers

V8
Excellent translation for the most critical listening requirements

KRK Systems, LLC • 954.689.8833 • www.krksys.com

KRK is a registered trademark of KRK Systems, LLC

TEC NOMINEE

A Stanton Group Company

MARK MY WORDS

U.S. cell phones understand HDML, not WML. In addition, a lot of WML-capable phones display HDML far more legibly than they display WML.

Here is the home page in equivalent WML:

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC
"-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/
wml_1.1.xml">
<wml>
<card id="Index" title="Markup
Languages for Electronic Musicians">
<p align="left">
<img src="e-musician.wbmp"
alt="e-musician"/>
</p>
<p align="left">
<a href="http://www.yahoo.com/"
title="Jobs">A Link to Yahoo!&#39;s
Home Page</a>
</p>
</card>
</wml>
```

Also based on a card concept, WML has more elements that are familiar from HTML, such as the <p>, <img>, and <a> tags. Because of the way WML is defined, tags must be in lowercase and attributes must be enclosed in quotes (to display a single quote, WML uses the character entity '). WML is picky about syntax, so if you try the examples on your site, be careful to enter the markup as shown.

Fig. 2 illustrates how that appears on a generic cell-phone display. The link is displayed rather crudely in the form of text enclosed in square brackets, which wraps to subsequent lines. That is not too user-friendly (it wastes what little screen space there is). Newer European cell phones show links with conventional underlines, which is better. Nevertheless, WML provides features that HDML does not, such as multimedia support, Java support,

FIG. 2: WML, which resembles HTML in many ways, is a newer language than HDML but is not compatible with many U.S. cell phones. This figure shows the WML version of the test page as displayed on a cell phone.

True blue.

S·com plus

Stereo Compressor/Limiter

It combines a feature-rich Compressor/Limiter, Expander/Gate and Enhancer offering precise control. And its logical front panel layout with extensive metering makes it easy to use. The *plus* is for its useful De-Esser that removes sibilance from vocals and reduces overly bright audio. Most importantly, **S·com plus's** audio path employs super low-noise VCAs with vast headroom and imperceptible distortion for transparency and sonic integrity.

And it carries S Class's assurance for intelligent design, superior functionality and unparalleled performance.

AEG Auto Envelope GENERATOR

SKD Smart Knee DETECTOR

EFR Enhanced Frequency RECOVERY

scripting support (called WMLscript), and secure connections. In the future, when more cell phones can take advantage of those features, WML will become the wireless markup language of choice.

HDML and WML use graphics formats different from HTML. HDML uses the common Windows-compatible bitmap format (BMP), but WML employs the special Wireless Bitmap format (WBMP), which few graphic-editing programs support. Fortunately, several Web-based applications can convert Windows bitmaps to Wireless bitmaps (see the sidebar, "Webliography"). More limiting, though, is the display capability of cell phones and PDAs. Most devices can display only small (about 100-by-50 pixel) monochrome images. That means you have to resample any image you want to use to the smaller size and reduce the color depth, which works best with simple, high-contrast images.

THE LANGUAGE CREATOR: XML

EXtensible Markup Language (XML) is the current techno buzzword. You may have heard that XML will replace HTML. Well, yes and no. XML has the potential to redress some of HTML's deficiencies, and it can also do a lot more, though it can be difficult to use.

So what's wrong with HTML? Consider the example I gave at the beginning of this article. Although the markup is simple, it gives what markup scientists call *context* to the information on the page. That is, it's easy to detect which text forms a title, a heading, and a paragraph. That's important because a person or a computer program, such as a Web spider or database engine, can determine what the information means, as opposed to how it should look. The downside is that the browser or other software determines the appearance of the page—how big the heading should be, what fonts to use, how closely to space the lines and letters on the page, and so on.

FIG. 3: MP3.com's Electronic page is a complex collection of text, graphics, and media files. Here is the page as displayed by Microsoft's *Internet Explorer* 5.

Different shades of blue.

S·phone
Four Channel Headphone Amplifier

It's simply the most versatile and flexible four-channel headphone amplifier you can own. Each channel incorporates independent Level control, Two-Band EQ and a Stereo Aux Input. Listeners can also mix in more of their own signal for "More Me." Plus, the amplifier will power all *twelve* headphone outs.

The **S·phone**, like the entire Samson S Class range, represents a new perspective on audio processing tools.

SAMSON

S Class. Burning Audio Technology. Cool Processing Tools.
To learn more about S Class products visit our website at www.samsontech.com.

© Samson 2001

MARK MY WORDS

Web designers have employed myriad work-arounds in HTML to obtain more control over page appearance and to add more interactive features. Those work-arounds include images used in place of text, tables used to position objects on the pages (not merely to format rows and columns of data), transparent images used as spacers, embedded scripts and programs, and in-line style definitions. For example, **Fig. 3** shows MP3.com's Electronic page (http://genres.mp3.com/music/electronic/), and **Fig. 4** shows just the first 63 of the page's 1,100 lines of markup. (See "Square One: What's in a Web Page?" in the March 2001 issue.) That works, but the resulting complexity of tags and features all but obliterates context, no matter how expertly coded the markup is.

Consider how powerful it would be to create a markup language that maintains human-readable context and has custom tags for the information in question. What if that same language provided accurate control of appearance and the ability to add new features and functions as desired? You can do all that with XML. For example, this XML-based markup is intended to store a discography:

```
<discography>

<summary>
<title>Schmo Money - Dance Mix</title>
<artist>Joe Schmo</artist>
<label>Joe Schmo Records</label>
<number>001</number>
<format>CD</format>
</summary>

<tracklist>
<track>
<title>Schmo Money - Dance Mix</title>
<time>10:19</time>
<note>Caution: Extreme bass!</note>
</track>
<track>
<title>Schmo Money Live (bonus track)</title>
<time>12:01</time>
<note>Live at the Podunk Amphitheater
</note>
</track>
</tracklist>

</discography>
```

All I did was create a tag set that encompasses the information I might like to store. I defined the context clearly and simply so that a computer (or a human) can understand it. That means that all kinds of devices and programs—Web browsers and spiders, phone browsers, MP3 players, databases, and so on—can use the information in ways that make sense. For example, a Web spider could index the information for future searches, a phone browser could display it as WML, or a database engine could import it. But I have to create only one type of markup, instead of one for each application.

I didn't attempt to define how the information might look when displayed. If I want to specify the layout and appearance of the information for a specific application, I can put those instructions in a separate, related document called a *style sheet*. I can provide style sheets for various purposes (such as a default style sheet for typical Web displays and a special style sheet that instructs a browser to use larger, high-contrast type to aid visually-impaired users).

The basic concepts behind XML are fairly straightforward. Frustratingly, an XML-based language is useless without an application that understands it. I can't just take the new language and open it in a magic XML reader. I have to create a program (called a *parser* in techspeak) that understands the tags and knows what to do with them. If I want other people to be able to use the language with their applications, I'll also have to create a Document Type Definition (DTD), which defines in computer terms what the language does. I may also want to create various style sheets. None of that is beyond the reach of a serious avocational Web programmer, but it can be daunting: it's not easy to learn.

Fortunately, XML is becoming widely established, and in the near future, you'll find many complete XML applications available to process many kinds of information. In fact, the example borrows from Discographic Markup Language (discML), which has a simple, browser-based parser and editor available for free. Although XML is called a markup language, it's more correctly considered a *metalanguage* because it is used to create other languages.

XHTML = HTML IN TRANSITION

Wouldn't it be cool if you could combine some of XML's features with the things that are familiar and easy to use in HTML? That's the idea behind eXtensible Hypertext Markup Language (XHTML). Based on XML, XHTML encompasses the standard tags of HTML version 4.0. Here's the markup language home page in XHTML:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC
"-//W3C//DTD XHTML 1.0 Strict//EN"
"DTD/xhtml1-strict.dtd">
<html>

<head>
<title>Markup Languages for Electronic
Musicians</title>
</head>

<body bgcolor="#FFFFFF" text="#000000"
link="#0000FF" vlink="#0000FF"
alink="#999999">
<img src="e-musician.gif" border="0"
width="200" height="40" /><br />
<br />
<a href="http://www.yahoo.com/">A Link
to Yahoo!'s Home Page</a>
</body>

</html>
```

Because XHTML is based on XML, its syntax is stricter than HTML's. XHTML documents must be identified as XML-based in the first line, and the XHTML DTD must be referenced explicitly in the second line. Tags and attributes must be in lowercase, attribute

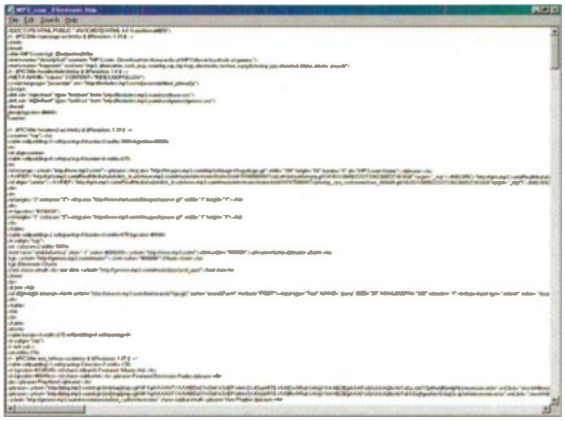


FIG. 4: The markup for a complex Web page can consist of hundreds of lines. This figure shows the first 63 lines of 1,100 used to create MP3.com's Electronic page.

values (including numbers) must be in quotes, and "empty" tags, such as the line break (<br>), must have a closing slash. That's more trouble than regular HTML, but XHTML is designed to be readable by all kinds of devices and applications, which HTML is not, yet still be readable by conventional Web browsers, including older browsers (with some restrictions). XHTML is still in development, but future versions promise the power to add new tags, functions, and features to HTML—the "extensible" part of eXtensible Hypertext Markup Language.

MORE MLS

VRML (pronounced "vur-mul") is often misidentified as a markup language, but the acronym actually stands for Virtual Reality Modeling Language. VRML allows the creation of dynamic, 3-D scenes, or "worlds," that can be viewed in a compatible browser (or with a browser plug-in). VRML structure and syntax are very different from those of markup languages and are closer to those of scripting languages. This code fragment defines the right front wheel in a 3-D rendering of a sports car:

```
DEF RightFrontWheel Separator {
 Transform {
  translation -2.0 0 -2
}
Material {
 diffuseColor 0 1.0 0
}
USE Wheel
}
```

VRML supports the creation of highly complex scenes from building blocks such as that. Moreover, VRML definitions can be imported into even more powerful modeling tools as a starting point for state-of-the-art visual effects, such as those used in film and video production.

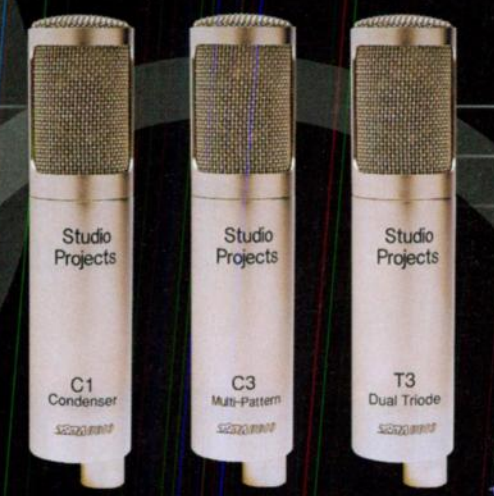
Dynamic HyperText Markup Language (DHTML) is a language that's

Hear What The Hype Is All About

"The C-3 is THE HIP new guitar mic. It gives your Marshalls that phat-gut-punch we all crave. I'll never cut another record without one."
Scott Rouse -Producer, Grammy Nominee, Nashville, Tennessee

I have a microphone "wish list". You have allowed me to check off both the U87 with the C1 and the C12 with the T3.
Ted Perlman - Producer/Arranger/Composer
Bob Dylan, Chicago, Kaci, 2gether, Young MC

One of the best vocal mics in the world is the $300 Studio Projects C1. You can spend way more for "one of those" mics from Germany if your ego demands it, but the C1 is certainly the sonic equivalent.
Pete Leoni -Producer Engineer, Tech writer and reviewer



C1 Single-pattern Cardiod List $299
C3 Multi-pattern Cardiod, Pad, Filter List $599
T3 Variable-pattern Tube List $1099

All models include shockmount and case.

VT-1
Tube Mic Pre, Discreet Class A/B switching, with variable Tube Drive. List $299

StudioProjects™ SP
PMI AUDIO GROUP
PMI Audio Group
23773 Madison St., Torrance, CA 90505 USA
toll-free 877 563 6335 fax 310 373 4714
Visit Us Online at www.studioprojectsusa.com

MARK MY WORDS

frequently referenced among Web designers, and it certainly sounds like a markup language—but it doesn't exist. DHTML is just a convenient acronym that refers broadly to the dynamic, interactive features that various Web browsers support. Because dynamic features are such an important part of the Web designer's toolkit, that acronym gets tossed around a lot. Without direct reference to a specific Web browser or software development environment, though, it's rather nebulous.

A MARKUP TEST-DRIVE

If you have a Web site, you can test-drive the HTML, XHTML, HDML, and WML examples. Simply open your favorite text editor (such as *Notepad* in Windows or *SimpleText* on the Mac) and enter the markup as shown. Then comes the slightly tricky part. You have to save each file with the correct extension. For HTML or XHTML files, use the extension .html (.htm will also work); for HDML files, use .hdml, and use .wml for WML files. Save the files as text only. Then, upload the files to your site or personal home page as text files (not as binary files). To view your HDML or WML test pages on a cell phone or PDA, access the device's Goto or Enter URL function and enter the complete address, including the extension.

DHTML is a frequently referenced language—but it doesn't exist.

Most Web servers are configured to understand those file types and send them with the correct headers (information that the server sends to the browser to tell it what to expect). If you receive an "unknown file type" or similar error when you attempt to read an XHTML, HDML, WML, or XML file, contact your Web site's administrator for help. For HDML and WML files, you can get a free WAP site from WAPdrive.

Markup languages are the key to unlocking the power of the Web, and as a desktop musician, it's a good idea to learn how they work. I hope this article will help you make the most of these languages, but stay tuned for further developments—markup is a moving target, to say the least.

Former **EM** *contributing editor* **Alan Gary Campbell** *is developing the Discographic Markup Language (discML) to facilitate broadly compatible storage of discographic information for sound recordings.*

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

SELLING EQUIPMENT?

GET IT SOLD!

It's Fast and Easy on Digibid!

digibid.com Auction Network
an IndustryClick solution

www.digibid.com

©2000 Digibid, an IndustryClick community. All Rights Reserved.

It's Time to Change the Channel...

Tube Preamp Channel Strip w/ Digital Out

376

In the digital world, you're only as good as your weakest link or channel. So, why settle for any less than the warmth and integrity offered by the new **dbx® 376 Tube Preamp Channel Strip with 96k Digital Outs**? For more than 25 years dbx has been setting the standard, and the 376 is the culmination of those years of innovative success.

With a feature list that includes a vacuum tube preamp section, three-band parametric EQ, compressor and the *real* kickers: built-in De-Essing and AES/EBU and S/PDIF digital outputs, make the 376 an all inclusive Channel Strip toolbox that's just as much at home in a conventional analog mixer application as it is in a state-of-the art digital workstation. With the 376 you can bypass the mixer all together, while producing warm and rich tube mic preamp tones in the digital domain by using dbx®'s proprietary Type IV™ A/D conversion system. Stop by your local authorized dbx® dealer and tune into all that is available on the next channel.

Unit is 19" wide and will not fit in a mixing console.

- **Tube microphone pre-amp**
- **De-Esser**
- **3-Band Equalizer**
- **dbx® Compressor**
- **Type IV™ conversion system**
- **AES/EBU and S/PDIF digital outputs**
- **Front panel instrument input**
- **+48 Volt phantom power**
- **Selectable dither and noise-shaping algorithm**
- **Selectable sampling rates (96, 88.2, 48, 44.1kHz)**
- **24, 20 and 16 bit wordlengths**
- **Word clock sync input and output**
- **Selectable mic/line switch**
- **20 dB pad**

dbx® the Standard in Professional Signal Processing

dbx®

PROFESSIONAL PRODUCTS

A Harman International Company

For information call: 1-800-777-1363 • Harman Music Group • 8760 South Sandy Parkway • Sandy, Utah 84070 • **www.dbxpro.com**

RECORDING MUSICIAN

Got You Covered

Save time, money, and face with multiple mixes.

By Kevin Smith

Once isn't always enough. Consider the following scenario: you do everything by the book—mix on reliable monitors, reference your mix to those in a similar style on major-label CDs, and check the mix on a variety of playback systems. A trusted second pair of ears helps with the mix, and you get positive feedback from several audio-savvy friends. By any account, your mix sounds great. Yet when you take the song to be mastered, the engineer says, "Hey, these vocals sound kind of buried. Do you have another mix with the vocals a bit hotter?" Your heart sinks. It had crossed your mind that the vocals could have been mixed hotter, but you were so excited about completing the project that you decided against it, even though doing a second mix would have taken a mere five minutes.

Sound familiar? If so, you perhaps learned the hard way what every experienced mixer knows: multiple mixes can save the day. Multiple mixes are alternate versions of an initial "final" mix. Typically, they incorporate modest level changes on critical elements—vocals, bass, effects, and so on. That provides options at the mastering stage and increases your odds of getting the best mix for the project. You may also need multiple mixes for situations such as mono playback (television), music beds, live performance, and remixes (by outside remixers). In addition to saving you hours of work and your client the expense of recalling a previous mix, multiple mixes can help you appear better organized and more professional to clients and industry executives.

How many alternate mixes are enough? There's no rule, but professional mix engineers routinely make six to ten mixes of

Planet Waves Instrument Cables

The Difference is Sound

DOUBLE-MOLDED plugs protect the soldering points like no other cable

DOUBLE-INSULATED conductors offer extremely low capacitance and protection from triboelectric noise

Lifetime Warranty

DOUBLE-SHIELDED cable offers 100% shielding coverage

COLOR-CODED for easy identification

Patent Pending

PLANET WAVES®

J. D'Addario PO Box 290, Farmingdale, New York 11735 USA • E-Mail: mail@planet-waves.com • www.planet-waves.com

a song and sometimes more than twice that. In other words, multiple mixes have become a mainstay of the modern mixer's duties. So do yourself (and your clients) a favor by planning in advance for multiple mixes and figure the extra time required into the job estimate. Not only are you more likely to end up with the perfect mix for the project, but the time required for preparing and printing the alternate mixes will also be perceived from the start, whether by you or your client, as part of the project rather than as an unnecessary last-minute hassle and expense.

THINKIN' IT THROUGH

For the purposes of this article, I'll assume you're working from a good mix. Multiple mixes are not intended to fix an existing mix, but to give you the advantage of having other versions of the mix already in the can. The extra mixes may or may not end up getting used; making them, however, is a smart move and a good safeguard.

How many and what types of alternate mixes are appropriate for a song or project is generally determined by the style of the music and the likely uses of the song or songs. I'll separate projects into three categories: vocal-based, non-vocal-based, and instrumental. Vocal-based can be in any style—folk, rock, pop, country, jazz, blues, R&B, rap, hip-hop, you name it. (I'll also assume you know how vocals are conventionally mixed in the style you work in.) The instrumental category covers a range of styles, too—think of the Ventures, Kenny G, and Bela Fleck and the Flecktones. The non-vocal-based category, though a bit harder to define, basically includes anything in between, from a TV spot in which sound effects are the main course to a jazz track that has vocals but for which an instrument carries the hook or main melody.

After categorizing the song, think of how it is going to be used. Is it by a group or a solo act? Will it be released as a single or an album track? Will it be performed live? Is it likely the song will get remixed? Those considerations will help you determine how many mix variations to plan for.

Once I determine the category and how the track will be used, the list of extra mixes begins to take shape. I have a number of base mixes I tend to do for any song, but depending on the project or band, I frequently end up creating additional mixes beyond those. For example, for a recent single, I did 16 mixes in addition to the main mix—hopefully enough permutations to cover the song's trajectory (see the table, "Bases Loaded").

Following are theories behind some common mix variations. Although some variations may seem redundant or unnecessary, I can attest to having used, at one time or another, each one described.

Finally, remember that there are no rules. The point is to make mixes you know will be useful to those who will be playing, performing, and pitching the song. It's likely you will need to come up with mix variations not addressed here, so don't hesitate to adapt them however you see fit.

Main mix. The main mix is the one agreed upon by those whose opinions count—the mix engineer, the producer, the singer, the songwriter, the band, or whomever. All variations are based upon the main mix. It gives you a reference point when comparing mixes.

Main-mix variations. These mixes give you (or the mastering engineer) valuable options when it comes to deciding which mix gets used on the CD or other release. That is, the initially designated main mix may be supplanted by a variation, which then becomes the main mix.

In a vocal-based song, the lead vocal is typically the key element and thus is a

BASES LOADED

This table shows documentation of multiple mixes made to cover all the bases for a single's release. The left column shows the mix type; in the right column is a suggested form of shorthand for labeling the mix variations. Always write out the full name of the song to avoid any confusion. Be simple and consistent with naming and keep multiple copies of your mix list.

Song Title: "The Bomb"
Song Type: Solo artist with featured guest
Category: Vocal based
Uses: CD track; single; music bed; live performance with tracks or partial band; possible remix

MIX TYPE	LABEL
Main mix	The Bomb
Main mix with +2 dB vocals	The Bomb +2 dB vox
Main mix with –2 dB vocals	The Bomb –2 dB vox
Main mix with +2 dB bass/kick	The Bomb +2 dB bs/kik
Main mix with –2 dB bass/kick	The Bomb –2 dB bs/kik
Instrumental mix	The Bomb instr
Instrumental mix +2 dB bass/kick	The Bomb instr +2 dB bs/kik
Instrumental mix –2 dB bass/kick	The Bomb instr –2 dB bs/kik
Mono mix	The Bomb mono
Mono instrumental	The Bomb mono instr
Vocal-only mix	The Bomb, vox only, w/fx
Vocal-only mix with no effects	The Bomb, vox only, no fx
Click-track split stereo	The Bomb, click (R click/L mono mix)
Multitrack click with stereo mix and separate click track	The Bomb, stereo mix, trk 3 click
Main mix with no lead or guest vocals but with background vocals	The Bomb, no ld or guest vox, w/bkgrnds
Main mix with no lead vocals but with guest background and vocals	The Bomb, no ld vox, w/guest & bkgrnds
Main mix with no lead background or vocals but with guest vocals	The Bomb, no ld or bkgrnd, vox, w/guest

The Shortest Distance Between Inspiration Creation

Motif 6 and 7
Great Feeling 61-Note and 76-Note FS Synth Action Keyboards

Motif 8
Newly Designed 88-Note Weighted Balanced Hammer Action Keyboard

At Yamaha, we believe that making music shouldn't be work. So we designed the Motif Music Production Synthesizers with two goals in mind—inspiration and creation.

First, they were designed to inspire. Their sounds were hand tailored by top sound design professionals from around the world. So whether it's an exacting replica of an acoustic piano for a Hollywood film score or a cutting edge sound from the clubs of London, these sounds were made by people with a passion for sonic perfection.

Next, we know that moments of inspiration need to be captured immediately. So all the tools for a complete music production are right at your fingertips. The features of the Integrated Sampling Sequencer, the hands-on user interface and the built-in rhythm patterns, arpeggios and mixing templates were all focused on one goal. Letting you create your music the way you want with the fewest technical obstacles.

So if you want to be on the leading edge of music production, check out these websites for more info and then check out Motif at a Yamaha dealer near you.

YAMAHA
CREATING "KANDO" TOGETHER

YAMAHA DMI
DIGITAL MUSICAL INSTRUMENTS

www.yamahasynth.com
www.motifator.com

For literature call (800) 932-6001 ext. 647 or visit www.yamaha.com to find a dealer near you.
©2001 Yamaha Corporation of America. Yamaha is a registered trademark of Yamaha Corporation. All rights reserved.
All other products or services mentioned are trademarks of their respective owners.

WDH

MUSIC PRODUCTION SYNTHESIZER

MOTIF

Synthesizer
- –64 Note AWM2 Synthesizer with a Huge 85 MB Wave ROM*
- –668 Great Sounds and 65 Killer Drum Kits

Integrated Sampling Sequencer (ISS)**
- –111,000 Note, 16 Track Integrated Sampling Sequencer
- –4 MB of On-Board Sampling Memory (expandable to 64 MB)
- –Real Time Recording of Pattern Chains, Track Mutes and Song Scenes
- –Automatically Syncs Loops of Different BPM
- –Imports Akai & A Series CD-ROMs with Program Parameters and Wave & AIFF Sample Formats

Control Surface
- –16 Track Buttons for Track Selection, Muting and Soloing
- –4 Physical (16 Virtual) Knobs and Sliders for Hands-On Mixer Style Control
- –Templates for Control of Cubase, Logic, Cakewalk and Pro Tools

Storage
- –Built-in SmartMedia, USB and Newly Designed SCSI Interface for Convenient Data Backup

Expansion
- –3 PLG Board Slots to Expand Polyphony, Effects and Synthesis Types
- –AIEB2 and mLAN Slots to Expand Digital and Analog I/O

* When converted to 16-bit linear format

good starting point for variations. Adjusting its level 2 dB up or down really changes the mix's feel, so I always do at least those two variations. For a featured vocal—say, on a jazz ballad or a songwriter's demo—the vocal typically needs to sit a bit on top of the other instruments; for a dance track or heavy-rock song, it may need to be somewhat buried in the mix. Having multiple mixes with the vocals approximately 2 dB up and 2 dB down gives you the flexibility to go either way.

Another thing that can really change the feel of a mix is the level of the kick drum and bass guitar (which, for these purposes, I think of as a single element). Thus, I also do variations with both the kick and the bass 2 dB up and 2 dB down.

If you extend that strategy to cover all possible permutations resulting from changes in just vocals and kick/bass, the number of mix variations grows exponentially to eight: the four already described, plus vocal 2 dB up and kick/bass 2 dB down, vocal 2 dB down and kick/bass 2 dB up, vocal and kick/bass 2 dB up, and vocal and kick/bass 2 dB down. That can soon lead to overkill, so you may need to limit yourself at some point, making sure that each mix variation contributes a truly different, and usable, perspective of the mix.

Another element you may want to mix variations for is effects, especially those on the main vocal and any ambience or similar unifying effects gracing the whole mix. In that case, the 2 dB up and down variations result in one mix that's slightly wetter (with more effects) than the main mix and another that's slightly drier (with less effects).

Instrumental mix. It's always a good idea to make an instrumental mix. I have found them invaluable, whether for background music for a TV show or Web site, for dance-club play, or even as a mix that a new singer can use to practice his or her parts.

Making an instrumental mix is simple: just mute the vocals. To really cover the bases, do the same up/down, kick/bass mixes you did on the main-mix variations. The instrumental is especially useful if you know the song will be released as a single (DJs love instrumentals). That way, too, your mastered instrumentals will sound identical to your mastered final mixes, sans vocals.

Performance mixes. I typically reserve these mixes for solo, rap, and hip-hop artists or for situations in which a performance will accompany the prerecorded tracks. Most rock and jazz bands don't play along with prerecorded tracks unless they are doing a song with special sound effects, and even then the keyboardist or drummer often triggers the sound effects. However, track performances are frequently the life of dance, rap, hip-hop, and solo artists who don't have bands or perform at venues that can't host a live band.

That's when things can get tricky. You have to think of every situation that the performer might encounter and then create the appropriate mix for each. For example, consider a solo vocalist who has a featured artist on his or her record. First, I would do a mix without the main artist's lead vocal, but with the guest vocal in. Next, I would do one without the artist's vocal and without the featured artist's vocal, just in case the two ever perform the song together live, but keep in any ad-libs and vocal doubling. If the song has background vocals, I might also want a mix with the main and guest artists' vocals, but no backgrounds otherwise. I might also need a mix with the main artist's vocals out, the guest artist's vocals out, and no backgrounds—but that would be the same as the instrumental, so I'm covered there.

▼ **Making an instrumental mix is simple: just mute the vocals.**

When trying to predict all possible situations for a song, it helps to discuss the scenarios with the artist, producer, manager, or whomever. Ask what performance situations the artist typically encounters and what type of promotion was done on his or her last project. Although it's not possible to foresee all uses of a song, with careful thought and mix planning, you should be able to provide a lot of flexibility for the artist.

A cappella mix. This is simply a mix of only vocals—not, as the name suggests, a mix of an actual a cappella performance. The a cappella mix is most useful to remixers and DJs who want to build new music tracks around an original vocal or mix the vocal over a different track. For maximum remixability, make wet and dry versions (that is, one mix with the original effects on the vocal and another without). Also, document all tempos and any tempo changes to take guesswork out of the equation.

Drum mix. Another helpful mix for remixers and DJs is one of only the drum tracks. If the song has percussion, leave that in too. For variations, make wet and dry versions and possibly even a mix with radical pan settings.

Click-track mix. Consider making a mix featuring a click track. A click-track mix is useful in situations in which a live band can play the song, but certain parts on the recording cannot be reproduced live—for example, a church choir or the sound of a jet taking off. In this case, mix a click track to one channel and the unreproducible parts to the other. The live-sound engineer can send the click track to the drummer (and to whomever else may want it) and route the other channel to the main speakers (and monitors, if necessary). If you have an Alesis ADAT, Tascam DA-88, or portable digital audio workstation (DAW), you could also make a 2-track stereo mix of the unreproducible material (to cover dramatic pan effects) and use a third track for the drummer's click.

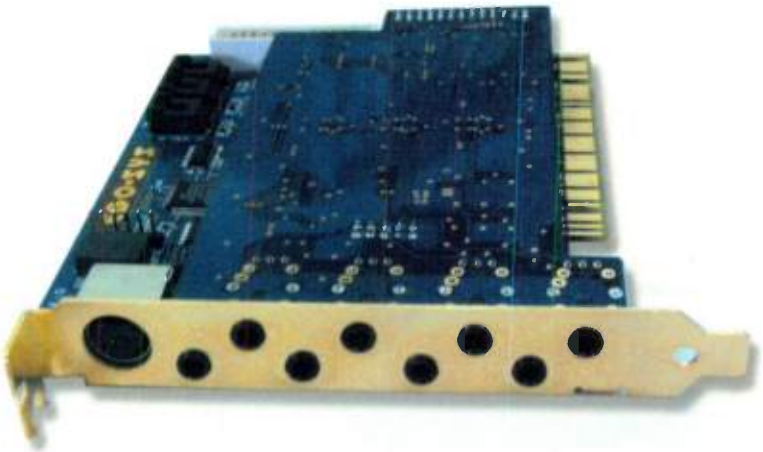
KEEPING TRACK

Organization is highly important when doing multiple mixes. For one thing, during a mix, your ear acclimates to hear even the most subtle change—but fast-forward to six months from now, and it's likely your mix variations will sound surprisingly similar, making it hard to correctly identify what's what if you didn't keep good records.

		WDM	E-WDM
1	MME bit depth	up to 16 bit	16/24 bit up to 32 bit
2	Total channel availability	12 in / 10 out	Unlimited I/O
3	Independent MME support	NO	YES
4	GIGA X ready	NO	YES
5	ASIO 2.0	Rarely	YES
6	SONAR with 1.5ms	NO	YES

Are you xp Ready?

EWDM is "One for All"



MaXiO

-64 Channel 24 Bit 96 kHz Digital Audio System

32ch ADAT Digital I/O, S/PDIF, AES/EBU, WordClock, MIDI, 24 Bit 96kHz Analog I/O(2 in 6 out)

Special ASIO core in hardware, No Latency Monitoring, S/MUX, 1.5ms with EWDM

7	98SE/ME/2000/XP	YES	YES
8	Multi Client	NO	YES
9	Multi Streaming	YES	YES
10	GIGA WIRE Enabled	NO	YES
11	Multiple MIDI ports	NO	YES
12	Multiple Direct Sound	NO	YES
15	-6 dB Problem fixed	NO	YES

EGO·SYS

www.egosys.net

3350 Scott Blvd, Suite 33 Santa Clara, CA 95054 Tel :408.748-1070 Fax: 408.748-1470

Develop a simple, consistent method of documenting mix variations. I emphasize *simple* because someone other than you may end up recalling the mixes at the mastering lab, and cryptic documentation will not only slow the process down, possibly raising the cost of the mastering, but could also make the producer, bandleader, or whomever leery about working with you again.

I suggest a simple shorthand that is consistent across all media. The logs of your mixes, your DAT or CD cover, and your saved DAW file all should be labeled identically. Use your DAW's Save As function to rename each mix. That way, if there is any reason to revisit a mix later, you have instant access and don't have to load the main mix and then manually re-create the alternate mix.

You can document your settings in other ways if you don't have the ability to digitally recall them. Prior to my digital-mixing days, I used to videotape my analog mixer and its settings, save the recording as a QuickTime movie, and then save the movie in my sequencer file. I could then replay the video and pause on a particular parameter as I reset the mixer.

HABIT FORMING

Making multiple mixes is not a glamorous job; on the contrary, it can be tedious, time consuming, and even boring. But if you don't make them, you leave yourself open to having to spend hours recalling a mix you did months or even years ago, only to arrive at something that would have taken a few extra minutes to do at the time. In other words, spending the time now will save time later.

Start now and get in the habit of making multiple mixes. That way, if a mix must be recalled, it is truly for a remix and not simply a re-edit.

When not mixing, **Kevin Smith** *writes songs and produces artists signed to his company, Family Tree Productions. When not in the studio, he updates the Family Tree Web site at www.familytreeproductions.com.*

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

SUBSCRIBE TO MIX TODAY

www.mixonline.com

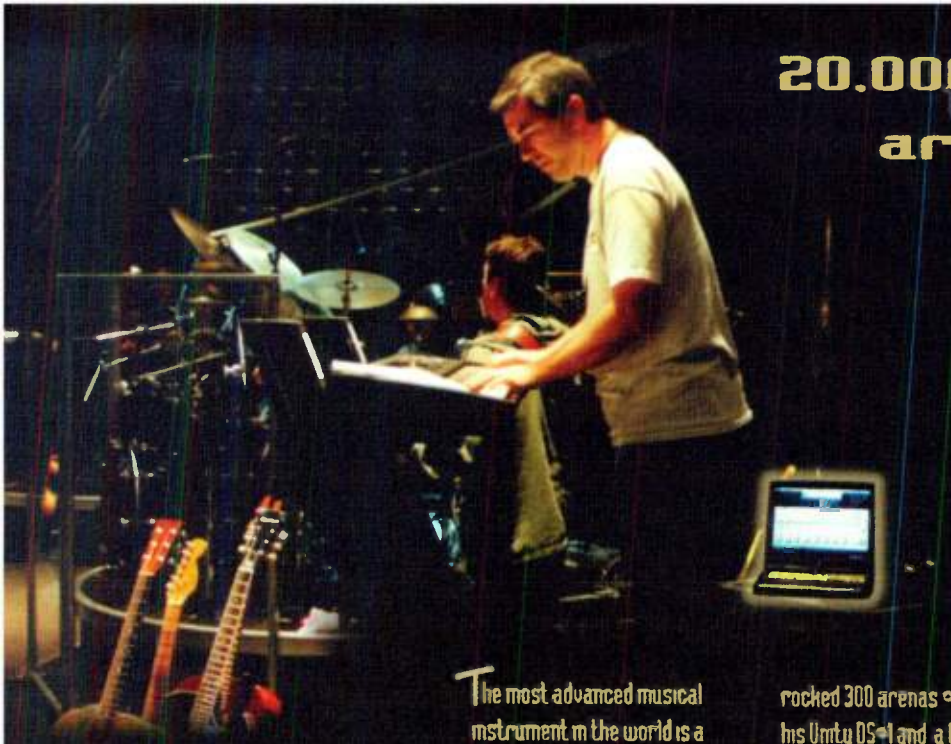
800-532-8190 PO Box 1939, Marion, OH 43306-8039

audio PROshop

www.audioproshop.com

best price selection advise

UNIVERSAL AUDIO
propellerhead
NATIVE INSTRUMENTS
STUDIO PACKAGE
APPLIED ACOUSTICS SYSTEMS
midiman
steinberg
RME
echo
digital audio
creamw@re



20,000 fans a night are listening to a software sampler for the first time

The most advanced musical instrument in the world is a computer. Just add Unity DS-1. That's how Musical Director Harry Sharpe of 'Wynonna' has rocked 300 arenas counting with his Unity DS-1 and a G3 PowerBook computer. Unity integrates with his sequences by day, and then becomes his 'live' 24-bit sampler by night.

Get free demos for PC and Mac at www.bitheadz.com. Take it with you into the studio or on your next world tour. BitHeadz software is every sound you ever wanted.

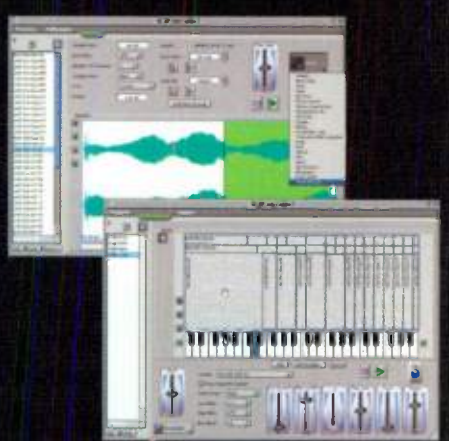
Unity DS-1

NOW v. 2.1!

- True phase-locked stereo signal path throughout
- Built-in digital audio editor
- Fantastic 24 bit, 96 KHz sound quality
- Imports most major sample libraries including Akai, SoundFont, & SampleCell
- ASIO, MAS 2.0 ReWire and DirectConnect support
- G4 and P3 optimized for up to 128 stereo voices

Unity DS-1 was designed for musicians by musicians. We wanted a real stereo sampler with layers, splits, and full MIDI continuous control. We also wanted lightning fast note-on response time and the ability to load huge samples in seconds instead of minutes.

Unity DS-1's ability to re-create the sounds of acoustic instruments or any other audio source with stunning realism and control is just the beginning. Extensive MIDI implementation for real-time control of all parameters, enormous capacity for RAM, and possibly the best integration into existing MIDI setups in the industry may even make your life a little easier. So whether you need a multi-timbral sound module at home, or a live performance sampler for the road, Unity DS-1 has power to spare.

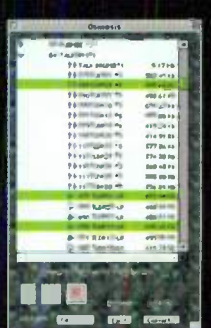


osmosis

Sample Conversion Utility by BitHeadz Inc

- Convert Roland- & Akai- libraries with a computer
- Convert entire multisamples
- Audition before converting
- Save as SampleCell II, AIFF, & Unity DS-1

Osmosis is a PC and Macintosh- utility that allows you to convert entire Akai- S-1000/S-3000 and Roland S760/770 formatted disks into Unity or SampleCell- formats. Osmosis will read samples from almost any removable media disk, and display the disk file hierarchy in a single window. Also, the entire disk directory can be saved to a text file. Convert all those great Akai- and Roland- libraries into the modern world of computer-based sampling. It makes the perfect companion for Unity DS-1 or SampleCell-.



BitHeadz

www.bitheadz.com

BitHeadz, Inc. 2850 South County Trail, Suite One
East Greenwich, RI 02818 Tel: (401) 886-7045 Fax: (401) 886-7049

Going Direct

Direct boxes get signals to their destination in style.

By Scott Wilkinson

During the past 15 years, many fundamental music-technology concepts have been explained in "Square One" (originally titled "From the Top"). In 1997 EM *technical editor Scott Wilkinson combined many of those columns into a comprehensive primer titled* Anatomy of a Home Studio: How Everything Really Works, from Microphones to MIDI, *published by EMBooks, an imprint of Artistpro.com (www.artistpro.com).*

Our readership has continued to grow, and new readers shouldn't be left behind. Rather than try to reinvent the wheel, we will periodically reprint excerpts from the book in the form of "Square One Classics." These articles will clarify the essential, unchanging concepts that make it possible to be an electronic musician.

The Jensen Iso-Max stereo DI box uses two JT-DB-E 12:1 step-down transformers, which are the round, metal objects in this open view.

COURTESY JENSEN TRANSFORMERS

When I first started playing around with electronic music equipment as a child, I tried connecting the output of an electric guitar directly to a line input on a mixer. I thought I didn't need a guitar amp because the mixer, power amp, and monitor speakers would do its job instead; however, that didn't quite work out. When I played the guitar, it sounded completely dead and low in volume. "How can I correct this?" I wondered.

I didn't know it at the time, but I had two relatively simple options. If I really had wanted to use the mixer's line-level input, I could have plugged the guitar in to an instrument preamp and connected the preamp's output to the mixer's input. But a simpler and cheaper alternative would have been to use a *direct-injection box* (also called a *DI* or *direct box*). Such a device converts an unbalanced, line- or instrument-level, high-impedance signal from an electric

TASCAM GigaStudio™ and GigaSampler™:
The World's Biggest, Fastest, Best Sampler. Period.

We don't like to brag, but there's no question: **TASCAM GigaStudio and GigaSampler** offer the very best sample playback performance of any sampler, hardware or software, ever made. The reason is simple: they are the only samplers that employ a patented technology allowing samples to stream from your PC's hard drive instead of being limited to RAM storage. The result is amazing: you can access up to 160 voices of HUGE samples (over four gigabytes in size), and the resulting detail, realism and sonic quality blows away any other sampler. Period.

As performance tools, GigaStudio and GigaSamper rule. Their incredibly low latency when accessed with any GSIF computer interface allows for fast, tight, real-time musical performances that are indistinguishable from playing a "real" instrument. Plus, GigaStudio's QuickSound™ technology enables instant location and previewing of samples and instruments in real-time. Its zero-latency NFX™ effects provide professional-quality signal prossessing for your samples. And if you need great sound libraries, the world's finest have been created expressly for GigaStudio and GigaSampler (and you can easily convert your other sample files into the Giga format).

So if you're into the very best that sampling technology has to offer, get into Giga. Visit your TASCAM dealer or check it out online at www.tascam.com, because when it comes to sampling, bigger and faster is always better. Period.

GigaStudio, GigaSampler, QuickSound and NFX are trademarks of TASCAM. All specifications subject to change without notice.

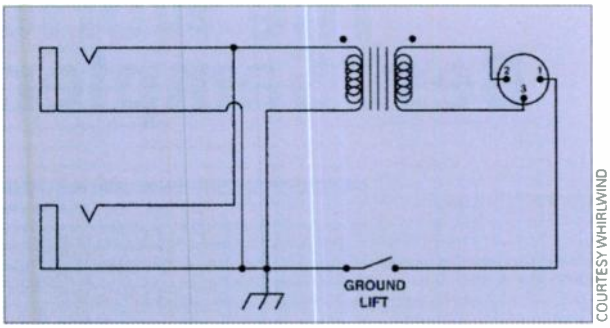
www.tascam.com

All copyrights are the property of their respective holders

TASCAM

or electronic musical instrument to a balanced, microphone-level, low-impedance signal that can be connected directly to a microphone input on a mixer or mic preamp (see **Fig. 1**).

The output from a DI box can be sent over long cables with much better noise rejection than is possible with a high-impedance, unbalanced signal from a guitar or synth. But that is not the only application for direct boxes.



COURTESY WHIRLWIND

FIG. 1: The Whirlwind IMP2 DI box is about as simple as it gets. The two ¼-inch input jacks are connected to the primary of a 10:1 step-down transformer, and the secondary is connected to an XLR output jack. Notice the ground-lift switch. The unused input can be used as a thru jack.

To understand how DI boxes work, you need to grasp the basics of impedance, decibels, and levels. If those terms are unfamiliar, see "Square One: The Shocking Truth" in the June 2001 **EM** and "Square One: Decibels Demystified" in the July and August 2001 issues.

TRANSFORMERS

The basic component of a simple DI box is a step-down transformer. All transformers consist of two or more long thin wires that wind many times around a metal core. The ends of each coil of wire protrude from the windings; one pair of ends is the input of the transformer, and the other pair is the output. The input coil is called the *primary*, and the output coil is called the *secondary*.

When you send an electrical signal through the primary coil, it creates a magnetic field around the coil. That field induces an analogous signal in the secondary coil, which appears at the output leads. If the primary has more windings than the secondary, it is called a *step-down transformer* because the signal level and impedance are lower at the output than they are at the input.

If the secondary has more windings than the primary, it is called a *step-up transformer* because the signal level and impedance are higher at the output; however, the power does not increase with respect to the input. Step-up transformers are used at the input stage of mic preamps and adapters to connect a microphone to a line-level or guitar-amp input. If the primary and secondary coils have the same number of windings, the component is called a *1:1 transformer*. That type of transformer is used in noise-reducing signal-isolation boxes.

In general, the primary and secondary coils are wound concentrically around the core (for example, if the secondary coil is wound first, the primary coil is wound around it). In addition, the primary and secondary coils are often separated by copper foil called a *Faraday shield*, which helps reject radio-frequency interference (RFI) between the coils. As the number of turns in the coils increases (that is, as the length of the wire increases), the transformer exhibits greater level-handling capability as well as lower distortion, but it also has less high-frequency response. The primaries of step-down transformers used in DI boxes typically include thousands of turns.

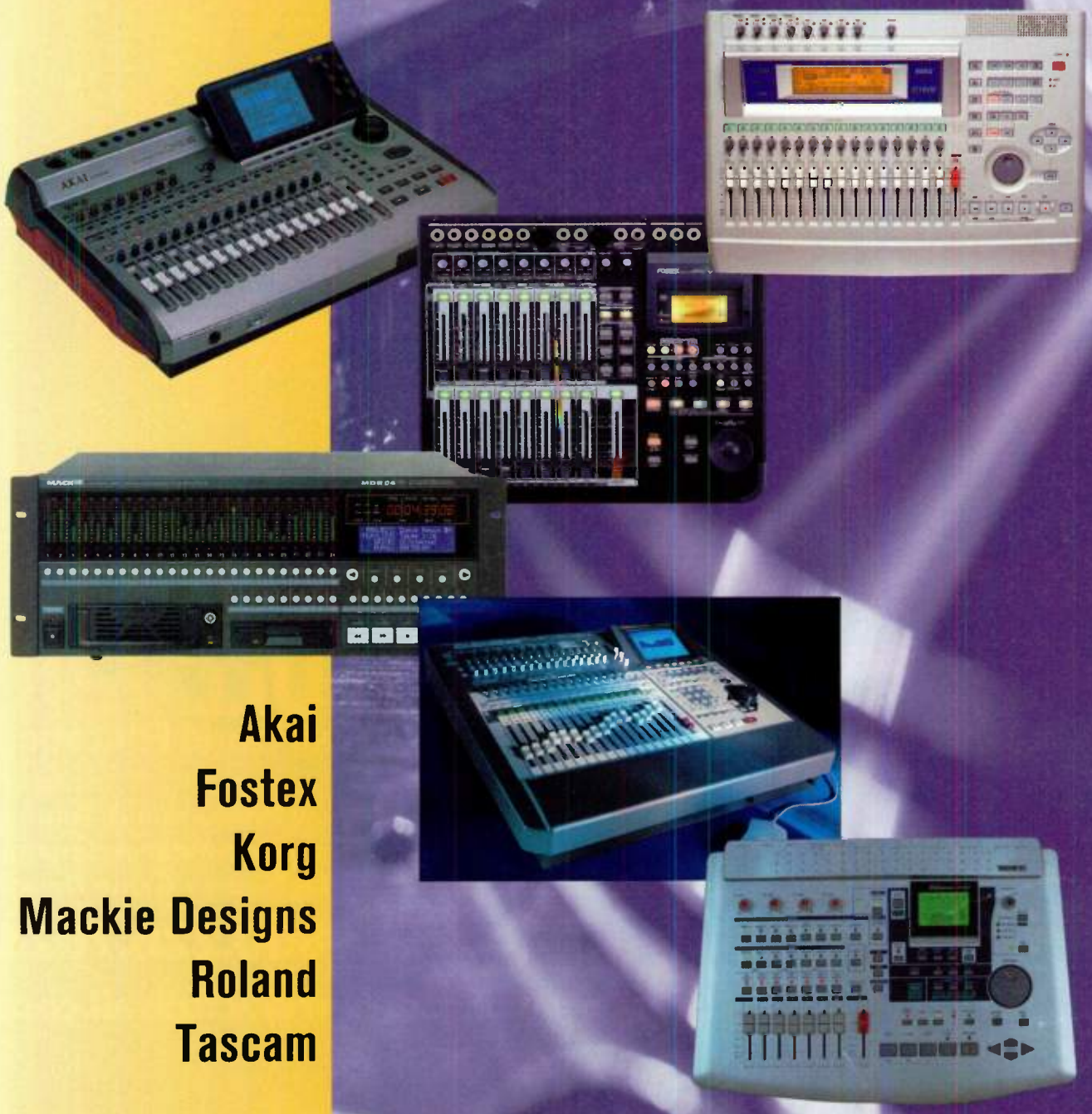
The relationship between the input and output signals is determined by the ratio of the number of turns in the primary and secondary coils. The change in signal level is directly proportional to the turns ratio. For example, if the turns ratio of a step-down transformer is 10:1 (that is, the primary has ten times as many windings as the secondary), the signal level drops by a factor of 10; if the signal level into that transformer is –10 dBV (a typical guitar or line level), the output level is –30 dBV (a typical mic level).

(continued on p. 123)

Special Advertising Supplement to *Electronic Musician*

Studios to Go

The New Generation of Hard-Disk Recorders



Akai
Fostex
Korg
Mackie Designs
Roland
Tascam

"Full Sail gave me the confidence and know-how to make it in the entertainment industry."
-Carlton Lynn
Credits include:
TLC
Monica
Sammie
Stevie Nicks
Brandy
Collective Soul
Joi
"Full Sail gave us the chance to have our hands on the latest studio equipment. . . . . Now, we've got our hands on some GRAMMYs®. We got the education we needed to succeed tremendously and in a relatively short period of time."
-Leslie Brathwaite
Credits include:
TLC
OUTKAST
Micheal Jackson
Monica
Toni Braxton
Aretha Franklin
Boyz II Men
FULL SAIL
Real World Education
School of:
Audio • Show Production & Touring
Film/Video • Computer Animation
Digital Media • Game Design
800.226.7625
Full Sail grads and winners of five GRAMMY® awards Carlton Lynn and Leslie Brathwaite.
Tune into webstationzero℠ at www.fullsail.com
3300 University Boulevard • Winter Park, FL 32792 • Financial aid available to those who qualify • Job placement assistance • Accredited by ACCSCT
©2000 Full Sail Recorders, Inc. All rights reserved. The terms "Full Sail", "Full Sail Real World Education", and the Full Sail and WebStationZero logos are either registered service marks or service marks of Full Sail Recorders, Inc. Other product and company names mentioned herein may be the trademarks of their respective owners. The appearance of these marks does not necessarily indicate a formalized sponsorship or affiliation with other such companies.

ADVERTISEMENT

Editor Mark Smith
Editor in Chief Steve Oppenheimer
Managing Editor Patricia Hammond
Assistant Editor Matt Gallagher

Art Director Karyn Kraft
Senior Art Director Dmitry Panich

Publisher John Pledger

Associate Publisher Erika Lopez
Advertising Director Joe Perry
Northwest Advertising Associate Joanne Zola
Southwest Advertising Associate Mari Stancati
Sales Assistants Kathya Fuentes, Joe Madison

Marketing Communications Director Christen Pocock
Marketing Manager Angela Muller Rehm
Marketing Events Coordinator Alison Eigel
Marketing Coordinator Starla Estrada
Marketing Art Director Wendy Shiraki

Senior Director of Production Curtis M. Pordes
Group Production Manager Melissa Langstaff
Advertising Production Coordinator Roxana Candillo
Computer Systems Coordinator Stanley Faulkner

Group Circulation Director Philip Semler
Circulation Marketing Manager Austin Malcomb
Circulation Fulfillment Coordinator Jef Linson

Human Resources/Office Manager Julie Nave-Taylor
Human Resources/Office Coordinator Janette Rosbroy
Receptionist Lara Duchnick

National Editorial, Advertising, and Business Offices
6400 Hollis St., Suite 12, Emeryville, CA 94608
tel. (510) 653-3307; fax (510) 653-5142;
Web www.emusician.com

Subscriptions, Customer Service
PO Box 1929, Marion, OH 43306
tel. (800) 245-2737 or (740) 382-3322
For fastest service, visit our Web site at www.emusician.com.

Back Issues
tel. (800) 441-0294 or (913) 967-1787

PRIMEDIA Business Magazines & Media
9800 Metcalf Ave., Overland Park, KS 66212

PRIMEDIA Business Magazines & Media
Timothy M. Andrews, Chief Executive Officer
Jack Condon, Chief Operating Officer
Ron Wall, President
Pete May, Vice President, Entertainment Division
Stephanie Hanaway, Division Director of Marketing

PRIMEDIA Business-to-Business Group
David G. Ferm, President and CEO
Andrea Goldschlager, Vice President and Group CFO
Craig Reiss, Chief Creative Officer

PRIMEDIA Inc.
Tom Rogers, Chairman and CEO
Charles McCurdy, President
Beverly C. Chell, Vice Chairman

All rights reserved. This publication may not be reproduced or quoted in whole or in part by any means, printed or electronic, without the written permission of the publishers.

PHOTOCOPY RIGHTS: Authorization to photocopy items for internal or personal use of specific clients is granted by PRIMEDIA Business Magazines & Media Inc., provided that the base fee of U.S. $2.25 per copy, plus U.S. $00.00 per page, is paid directly to Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923 USA. The fee code for users of this Transactional Reporting Service is ISSN 0884-4720/2001 $2.25 + $00.00. For those organizations that have been granted a photocopying license by CCC, a separate system of payment has been arranged. Before photocopying items for educational classroom use, please contact CCC at (978) 750-8400. Organizations or individuals with large-quantity photocopy or reprint requirements should contact Reprint Management Services at (717) 339-1900. Microfilm copies of *Electronic Musician* are available by calling Bell & Howell Information and Learning (800) 521-0600 or (313) 761-4700.

Electronic Musician's Studios To Go is published by PRIMEDIA Business Magazines & Media Inc., 6400 Hollis St., #12, Emeryville, CA 94608; tel. (510) 653-3307; fax (510) 653-5142; Web www.emusician.com. *Electronic Musician* is a registered trademark of PRIMEDIA Business Magazines & Media Inc.
Copyright 2001 by PRIMEDIA Business Magazines & Media Inc. This is the 2002 edition. All rights reserved.

Printed in the USA.
Also publishers of *Electronic Musician*®, *Mix*®, *Onstage*™, and *Remix*™, *Personal Studio Buyer's Guide*®, and *Desktop Music Production Guide*®.

PRIMEDIA Business Magazines & Media
ABM

The Case for Hardware HDRs

By Steve Oppenheimer

Standalone hard-disk recorders (HDRs) remain very popular, despite the enthusiasm for making music with computers. There are two basic types of hardware HDRs: rackmount modular hard-disk recorders (M-HDRs) and tabletop portable digital studios. A standalone HDR is a computer in a specialized case with audio and MIDI jacks, one or more displays, and a handful of switches. Portable digital studios consist of an HDR and a mixing surface containing an assortment of faders and knobs. Most have onboard effects or accept add-on effects processors.

Unlike a desktop computer, a standalone HDR has an operating system and user interface written specifically for audio recording, editing, and mixing. Because they don't have to handle the huge variety of tasks a general-purpose computer does, hardware HDRs are likely to be far more stable. Furthermore, most such systems are designed to take more physical stress than, say, the average laptop computer—and they have a wealth of inputs and outputs.

Many hardware HDRs lack the in-depth editing features of a computer-based workstation, but they're often quicker and easier to use. You don't have to install software and sweat over incompatibilities; just hook up the audio (and perhaps MIDI and clock) cables, turn it on, and go to work.

The stories in this supplement cover many of the latest M-HDRs and portable digital studios. EM's staff asked the manufacturers to write about their products, and our staff then edited the stories for your enjoyment. By the time you have read all six stories, you should have a good sense of what's available and what each manufacturer views as the strengths of its products. We hope this will help you choose the right recording device for your needs.

Special Advertising Supplement to Electronic Musician

Studios to Go

3 . . . . . Editor's Note

4 . . . . . Setting the Standard: Akai DSP24 and DPS16
By Randy Hargis

7 . . . . . Bridging the Gap: Fostex VF-16
By Derek Badala

10 . . . . . Unleashing Your Creativity: Korg D1600
By Tom Norton

14 . . . . . Breaking New Ground:
Mackie Designs MDR 24/96 and HDR 24/96
By Zach Boyle

17 . . . . . Life in the Fast Lane: Roland VS-2480
By Laura Tyson

20 . . . . . Generation Next: Tascam 788 and MX-2424
By Jeff Klopmeyer

Cover: Karyn Kraft

ADVERTISEMENT

Setting the Standard

Professional results require professional tools.

By Randy Hargis

Akai's Digital Personal Studio (DPS) series is a driving force in the recent explosion of personal digital recorders on the market today. The DPS series offers all-in-one solutions for audio producers in every aspect of this competitive market.

Spearheading the movement toward greater flexibility are the 16-track DPS16 and the 24-track DPS24 digital personal studios, which provide a wealth of features for home-studio owners. From the DPS16's crystal-clear sound to the DPS24's easily navigated features set, Akai offers the tools to record whatever you can dream up. First, I'll take a look at the DPS16.

Akai's user-friendly DPS16 features Q-Link knobs in the upper right of the unit, which let you make real-time changes to channel EQ or effects settings.

SWEET 16

The DPS16 is the only 16-track portable digital recorder that provides true 24-bit, 96 kHz recording with no compression schemes for artifact-free recording. This rarity is further enhanced by the fact that 24-bit, 96 kHz audio projects produced on the hard-disk recorder can use the Q-CD mastering tools, which include bit-rate conversion with dithering, sample-rate conversion, and a multiband compressor/expander. The DPS16's B.U.R.N.-proof CD production converts the project to 16-bit, 44.1 kHz audio for CD burning, which is a tool not available in other hard-disk recorders. The original project, however, can be archived to CD with its full bit-rate and sample-rate values intact—a tool that is unique to the DPS16.

The DPS16 provides 16 physical tracks, recording as many as 10 tracks simultaneously, and has 250 freely assignable virtual tracks. Switching among virtual tracks (that are assigned to physical tracks) lets you record multiple takes of the same part or phrase and later select the best take for mixdown. The 20 GB internal IDE drive offers more than four hours of 16-track recording.

Akai made the DPS16's feature set easily accessible; Q-Link Navigation proves that it is possible to provide the much sought after "out-of-the-box" operation. All major recording, editing, mixing, and effects functions are easily accessed with a single button-press. The six Q-Knobs mounted on the DPS16's 6-inch diagonal, flip-up graphic display allow real-time parameter adjustment for mix and effects parameters. For example, dialing in the reverb depth for the snare drum or the compressor attack for the vocal mics is easy, feels natural, and doesn't interrupt the flow of your work.

Editing (down to the sample level) on the DPS16 is what you would expect from Akai. The flip-up graphic display (320-by-240) brings to light the DPS16's editing features. You will find the expected copy/overwrite, copy/insert, cut/overwrite, cut/insert, insert silence, cut/discard, cut/move, time stretch and

stretch-move features. What you might not expect to find are normalize; change levels (to bring down the level of a specific region of audio); save as WAV; load WAV; read/write WAV to FAT 16, FAT 32, CD-R/CD-RW drives; and bit-rate conversion with three different dithering algorithms.

The DPS16's 26-channel mixer is fully loaded with EQ, pan, aux sends 1 through 4, level, channel on/off capabilities, and 16 individual faders and pan controls. The EQ features high-quality, 3-band, 56-bit sweepable high and low bands and a fully parametric midband. All three bands provide 128 steps per octave, giving you the power to isolate the frequencies you need to bring your mixes to life.

The mixer has eight balanced analog inputs and one stereo digital input; two of the analog inputs feature XLR combo jacks, which have switchable phantom power to allow the use of high-quality condenser microphones. The combo jacks can also accept ¼-inch balanced or unbalanced connections, providing a greater deal of flexibility in the studio or for live applications. You can switch Input 8 to a high-impedance mode, allowing the direct recording of guitar or bass tracks.

Ultimately, the goal of any audio producer, whether recording bands, doing solo work, or creating jingles, is to present a product that can be admired for its creativity and sound quality. Using 24-bit, 96 kHz A/D/A converters and 56-bit internal processing, the DPS16 continues the Akai legacy for pristine sound. The internal 4-bus multi-effects processor utilizes 56-bit digital signal processing (DSP); includes a real-time vocal-pitch corrector; and has a multiband compressor/expander with four bands of compression and adjustable crossover points, adjustable slopes, and reduction meters. You can select four channels of stereo multi-effects from among 44 types and route them through aux send/return 1 through 4 or insert them into a specific channel.

It is easy to see why the DPS16 has quickly become the 16-track recorder of choice for some of the most influential artists and songwriters in the business today. But what if 16 tracks are not enough?

FIG. 1: The DPS24 can record 20 tracks simultaneously with 250 virtual tracks.

SIXTEEN? HOW ABOUT 24?

Building on the success of the Akai MG1212, MG1214, and MG14D analog multitrack tape recorders, and the award-winning DR and DD series digital recorders, digital audio workstations (DAWs), and digital dubbers, Akai's DPS24 sets the standard for affordable, professional recording products (see Fig. 1).

The DPS24 is a 24-track, 24-bit, 96 kHz digital personal studio. The DPS24 supports 32, 44.1, 48, 88.2, and 96 kHz sampling rates and 16-, 20-, and 24-bit resolutions. As with all Akai digital personal studios, it uses no data compression to achieve the disk performance and artifact-free clarity needed in a professional multitrack disk recorder. Twenty tracks of audio can be recorded simultaneously with 250 virtual tracks, 24-track simultaneous playback, and a special transfer mode enabling 24 tracks of simultaneous recording. The DPS24 comes with a 30 GB IDE internal drive and a 5.25-inch drive bay with CD recorder option.

The multi-angle LCD (320-by-240) makes sample-accurate, multichannel waveform editing easy (see Fig. 2). The DPS24's intuitive, multimode edit suite features the normal cast of characters with all variations of cut, copy, move, insert, and erase, as well as time-stretch (allowing phase coherent processing of stereo recordings), pitch-shift, normalize, reverse,

Product Information

Akai
DPS16
DPS24
digital personal studios
DPS16 $1,999
DPS24 $5,499

Contact Information
Akai Musical Instruments Corporation
tel. (800) 433-5627 or (817) 831-9203
e-mail info@akaipro.com
Web www.akaipro.com

ADVERTISEMENT

bpm matching, and fast transport/edit with a high-resolution Jog mode. The DPS24 also offers 256 levels of undo.

THE MISSING LINK

Popularized by the successful DPS16, Akai's Q-Link Navigation features make searching through complex layers of menus a thing of the past with direct access to all major recording, editing, mixing, and effect functions. Six Q-Knobs located on the LCD offer easy real-time access to effects parameters and system control.

The combination of a serious multitrack hard-disk recording system and a professional digital mixer eliminates the need for complex multiproduct interfacing. At the DPS24's heart is a 44-channel, 20-bus digital mixer with eight subgroups. Twenty-eight balanced analog inputs, with 24-bit, 96 kHz A/D converters, allow for constant connection of the vital components of any studio. The back panel boasts 12 mic/line inputs on balanced XLR/phone combination jacks (Bank A); 12 mic/line inputs on TRS phone jacks (Bank B); stereo line-level aux input; a Hi-Z override phone jack on input 12; 2-track tape return; and coaxial, stereo, assignable S/PDIF, and ADAT-S/PDIF switchable MPLP (multipurpose Lightpipe). Balanced inserts on inputs 1 through 4 allow direct ADC connection for external mic preamps. Analog outputs for the DPS24 include balanced master, main monitor, nearfield monitor, studio out for talkback, and four effects sends. Digital outs include S/PDIF coaxial and ADAT-S/PDIF switchable MPLP.

FIG. 2: The DPS24's multiangle LCD and Q-Link Navigation system lets users navigate the unit's wealth of features.

Using the standard analog and digital outputs, the DPS24 provides 5.1 surround mixing and monitoring. Interface options for the DPS24 include FireWire (IEEE 1394), 68-pin SCSI (50-pin SCSI is standard), SMPTE, ADAT 16-channel I/O (for a total of 24 with standard MPLP) and ADAT sync.

When connecting your ADATs to the DPS24, you'll find that the DPS24's footswitch accepts ADAT LRC connectors and controls the transport and locate features of both the ADATs and the DPS24.

Dedicated tactile mixer controls augment the DPS24's Q-Link Navigation system; 100 mm motorized Q-Touch (capacitive-touch) faders controlling five fader banks make easy work of programming and editing the built-in dynamic and scene mix-automation data. Multifunction rotary encoders serve as a full channel strip while in Q-Channel mode and as pan or effects sends controls while in Q-Strip mode. A collar of LEDs surrounds the rotary encoders for checking their values at a glance.

Each of the 44 inputs and the DPS24's L/R master have an independent dynamics processor with a compressor, limiter, and noise gate. Each channel features 56-bit, 3-band EQ with sweepable low- and high-shelving bands, and a fully parametric midband. Also included on each channel is EQ bypass, four effects sends to internal or external effects (switchable pre/post fade), gain, phase invert, input source select, stereo link, group assign, L/R assign, and solo/mute. Internal processing is 56-bits, including the standard 4-channel multi-effects processor. An assortment of effects lay waiting to complement your musical endeavors. Reverbs, flange, phase shift, pitch shift, delays, rotary speakers, auto-wah, touch-wah, and a real-time vocal pitch corrector are a few of the DPS24's tools. An effects library function helps catalog effects parameters for easy reference.

The DPS24 has obvious advantages over a piecemeal system. With no slowdown in processing power due to demands made by plug-in applications, and no operating system crashes related to competing applications, its dependability is rock solid. Additionally, integrating a matched suite of products with an intuitive work surface enables complete multichannel audio production, from mic preamp to CD, all in one box.

But what about working outside of the box? Akai's *ak.Sys* control software (Mac/PC) adds the ultimate dimension to the DPS24. The DPS24's USB interface allows the *ak.Sys* to control provide a real-time SVGA TrackView display, future networking capabilities with other Akai products, and easy software updates. Utilizing the optional 1394 FireWire interface board, *ak.Sys* will support VST plug-ins, allowing the *ak.Sys* computer to be used as a real-time effects engine.

OUTSIDE THE BOX

From the solid functionality of the DPS16 to the 24-track DPS24, Akai's hard-disk recorders give gristled veterans and burgeoning producers alike the tools necessary to record crystal-clear, compelling audio. Using Akai's Q-Link Navigation, users can take advantage of the units' impressive power with a minimum of heartache. With the right tools at your fingertips, nothing can stop you from recording your personal masterpiece.

Randy Hargis *has worked for Akai for 12 years as everything from a product specialist to his current position as marketing manager.*

ADVERTISEMENT

Bridging the Gap

Charting new territory with Fostex's VF-16.

By Derek Badala

The Fostex VF-16 is Fostex's fourth-generation, standalone hard-disk recorder. It appeals to experienced musicians and novices alike and provides flexibility and a user-friendly setup for optimal recording results. Building on the strengths of previous generations, the VF-16 offers 16 tracks with a vast amount of features and superior sound quality for an affordable investment.

Users looking to explore the world of hard-disk recording or those seeking another element to their setup should look no further than the VF-16.

The Fostex VF-16 comes with eight channels of ADAT and two channels of S/PDIF I/O.

UNDER THE HOOD

With its 16 dedicated mixer channels with fader, pan, two internal effects, two aux sends, and a 3-band EQ on every channel, the Fostex VF-16 offers a simple means for creative manipulation on every track, whether you're recording or mixing. The a 4-channel compressor can be used on mixer channels 13 through 16. If you want to compress the stereo mix, you can assign a stereo compressor to the mix from the Setup screen.

The VF-16's mixer has eight dedicated mic/line preamps on ¼-inch unbalanced TS jacks. Inputs 7 and 8 include balanced XLR inputs with assignable 48V phantom power. Those analog inputs let you record eight tracks simultaneously using just the analog-input section. With the onboard ADAT Lightpipe input and output, the VF-16 user can achieve 16 tracks of simultaneous recording. Do you need an 8-channel analog-to-ADAT converter? Fostex offers an excellent solution in the VC8 ($339). In case you want to route the stereo mix to a digital output, the ADAT I/O can be configured to S/PDIF directly in the Setup screen.

The VF-16 records 16-bit audio at 44.1 kHz on all 16 tracks, without data compression, for superior sound quality. Recording at the same bit depth and resolution needed for the final CD facilitates simple CD burning without fidelity loss from sample- or bit-rate conversion. In addition to the 16 record and playback tracks, the VF-16 provides virtual tracks 17 through 24. Those can be interchanged in any combination with tracks 1 through 16, allowing multiple takes of a single track (a lead vocal, for example) or even a group of tracks (an 8-track drum part). That way, an entire performance consisting of more than a single track (for example, drum parts) can be done multiple times, and an A/B comparison can be achieved with a simple push of a button.

ADVERTISEMENT

The VF-16's mixer also offers convenient headphone and monitor outputs on ¼-inch unbalanced TS jacks. Those are independent of the stereo output so a user can easily connect a pair of studio monitors without sacrificing the stereo mix output. For example, Fostex offers a range of mastering headphones, including the new T50, as well as the T40 and T20 models. Fostex also provides the PS3.1 powered monitoring system, which comes complete with cables. The VF-16's rear panel (see **Fig. 1**) has an input for an optional footswitch (Fostex model 8051) for hands-free punch-in/out.

FIG. 1: Digital I/O on the Fostex VF-16 can be switched from S/PDIF to ADAT format, providing eight additional simultaneous recording inputs.

IT'S AUTOMATIC

If automation is what you fancy, the VF-16 offers scene automation where every parameter can be stored and recalled manually or according to a song's timeline. That feature can even be used to achieve a sort of pseudodynamic automation with continuous fader adjustments.

Parameters such as fader position, mutes, pan, effects settings, effect sends, aux sends, compressor settings, routing, and EQ settings can be saved and recalled using scenes. Executing is easy; click on the Store key followed by the Scene key. Although the VF-16's faders are not motorized, the fader position can be visually recalled so you can adjust the physical fader.

Product Information

Fostex
VF-16
hard-disk recorder

Contact Information
Fostex Corporation of America
tel. (562) 921-1112
e-mail info@fostex.com
Web www.fostex.com

If you like to record lots of songs, then you will like the VF-16's Program feature. A Program is simply a place to record your song. It has its own set of locate points and setup parameters. That way, each song you record can start at a zero-position and have its own set of MIDI, routing, and setup parameters. The final advantage is that programs can be archived individually so you can save and reload songs without having to wait for an album project to be loaded.

The VF-16's editing tools include cut, copy, paste, and erase. There is also a convenient waveform display, which is handy when scrubbing while setting the in and out points for your edit. The scrubbing tool is also useful for fine-tuning in and out points for punching or looping purposes.

FEEL THE BURN

Recently Fostex introduced version 3.02 software, which greatly enhances some of the VF-16's mastering capabilities. The most significant new feature is the ability to archive and master directly to an external SCSI CD burner. In addition, version 3.02 allows the VF-16 to mixdown (or bounce) all 16 tracks to a new program. That new program can be your final mix or simply a 16-track bounce so you can record more tracks. All VF-16s now ship with version 3.02 already installed.

The VF-16 comes with two internal effects processors. Those are easily assigned to a track by using aux sends 1 and 2. The effects algorithms include many types of reverb, flange, chorus, delay, and pitch-shifting. Those effects can be modified, and new ones can be stored and recalled.

The onboard EQ consists of fully parametric high and mid bands and a low-shelving band. Every channel on the VF-16, including the master fader, has an EQ section—enough for the most demanding mixing applications. With this type of EQ, you can not only boost and cut a frequency, you can also choose how many adjacent frequencies you want to alter. The end result is a very powerful frequency adjust tool.

MASTER AND SERVANT

The VF-16 supports MIDI Time Code and MIDI Clock for synchronization purposes. If you want to use the VF-16 as a master and slave your sequencer or drum machine, you can send MIDI Time Code through the MIDI Out port to your external equipment and simply set that equipment to slave to the incoming MIDI Time Code. You can also set the VF-16 to slave to MIDI Time Code by reversing the process. When using a drum machine or keyboard sequencer it's often more desirable to sync the two systems based on bars, beats, and the song's tempo. This method of synchronization utilizes MIDI Clock. The VF-16

ADVERTISEMENT

can be the master only in such a configuration.

Simple MIDI Machine Control is also supported by the VF-16. That allows external equipment to control the VF-16 transports start, stop, rewind, fast-forward, and record functions.

BURN, BABY, BURN

Archiving and burning CDs once a project is recorded is a common need. Users often want ways to use their computer in the recording process, but for those that don't have a computer in their future, the optional Plextor PX-W1210TSE external SCSI CD burner can burn discs for archiving or mastering. This third-party solution has been tested and approved by Fostex. Simply tell the VF-16 what mixes you want to burn and start the burning process. For those who prefer a standalone CD burner, the process is similar to a traditional mixdown: connect the digital stereo output of the VF-16 to the burner's digital input, press Record and Play, and you're off and running—or rather, burning.

The VF-16 records audio tracks and stores them in the Fostex FDMS-3 format. The VF-16 uses that format to optimize its performance for recording and playback. To transfer those tracks to your computer, you can export them to an external SCSI device as standard WAV files, using the Import/Export feature. You can use the feature to archive your VF-16's hard drive to an external hard drive, archive to your computer, use your recording software to further edit your VF-16 audio, and even burn a CD using your computer's burner.

As you can see, the VF-16's Import/Export feature provides users with a lot of powerful options and clearly bridges the gap between standalone and computer-based recorders. Here are a few examples of how it can be used to your benefit.

WELL, GET ON WITH IT

Say you have recorded a song on the Fostex VF-16 and have mixed it down internally to a new program. The mix can be exported through the SCSI interface to an external hard drive that is connected to your computer. Your mix shows up on your computer as two WAV files, which represent your mix (left and right channels). From there you export the files to a software recording application, save them as a stereo mix file, and use your CD-burning software to burn an audio track on a CD.

The VF-16 clearly bridges the gap between standalone and computer-based recorders.

A user may want to record using the VF-16 but also want to import those recordings into software for further editing and mixing. That's achieved by simply choosing to export all 16 tracks to the external SCSI device instead of just a stereo mix. Those files can be saved to any available medium for archiving purposes or can be imported into software.

A third option for archiving simply uses the digital I/O on the VF-16 utilizing either the ADAT or S/PDIF mode. By connecting the digital output to a standalone CD burner or DAT machine, you can archive or mixdown directly to the machines. That method is a much more direct approach and is recommended for users who are new to the world of digital recording.

Another simple and affordable means of getting audio from the VF-16 to a computer is by using a digital audio interface. One such interface—TerraTec's EWS-88D sound card—is both affordable and effective. This sound card supports the S/PDIF and ADAT formats and comes with two choices of recording software. You can also transfer a 16-track project using the Archive feature and record the archive directly into your software.

Once completed, your 16-track project is saved to your computer, and it can be returned to the VF-16 completely intact. You may also master using the EWS-88D by mixing down directly to your computer software through the digital output.

IT'S ALL HERE

The Fostex VF-16 delivers a powerful and complete standalone hard-disk recorder solution for the serious recording musician. Whether you are just starting out or need a dedicated companion to your existing setup, the VF-16 is your answer.

Fostex also offers the 8-track VF-08 at an even more affordable price. Continuing with the development of this technology, Fostex has also recently introduced its 24-track D2424 recording system. Aimed at the professional market, the D2424 contains many of the same recording and editing features of the VF-16.

Derek Badala *is Fostex's product manager for the musical instruments division.*

ADVERTISEMENT

Unleashing Your Creativity

The Korg D1600 redefines *intuitive.*

By Tom Norton

Creating and realizing your musical ideas with the Korg D1600 is simple. Using technology perfected in the Korg Triton synth, the D1600's TouchView graphical user interface saves you precious time by allowing instant and intuitive access to every function, bypassing pages of menus. As you work, you can move quickly through the modes with single keystrokes. As a result, you can concentrate on what's really important: being creative.

Korg's D1600 hard-disk recorder is the only unit on the market that has a touch screen. Track-input buttons are assigned on a virtual input screen.

HIGH FIDELITY

The D1600 offers 44.1 kHz linear recording and uses no data compression schemes. That means the original signal is faithfully captured, and the dynamic range is preserved, allowing for a clean and distinct final mix. You can choose 8-track simultaneous recording with 16-track playback at 16-bit, 44.1 kHz or 4-track simultaneous recording with 8-track playback at 24-bit, 44.1 kHz.

Korg provided ample inputs and outputs for just about any project you're working on. The D1600 features eight ¼-inch balanced inputs and four XLR jacks, each with high-quality microphone preamps and individually switchable phantom power (see Fig. 1). A dedicated guitar input is located on the front panel, right where it should be.

There's also Channel Pairing for when you need to use adjacent channels as stereo pairs. There are L/R Monitor and Master outputs (both ¼-inch unbalanced). The S/PDIF optical digital I/O automatically converts 32 kHz or 48 kHz signals to 44.1 kHz for direct digital recording. There's an aux send, with send levels on each channel. Korg eliminated the need for manual repatching of inputs to channels. Once you've connected your sources, you can digitally set your routing. The D1600 remembers your input-routing schemes when you select new songs. A 50-pin SCSI D-sub connector allows you to use external fixed- and removable-media drives for backup, recording, and playback of your data.

There are 8 virtual tracks for every track, for a total 128. When you need to pick and choose from numerous takes, just press the Track

ADVERTISEMENT

key and select the take that you want to use. Korg has also provided a 2-track virtual Bounce mode, which lets you perform multiple stereo mixdowns of 16-track recordings to 2 virtual tracks, without overwriting existing tracks. You can then select your favorite mix for final mastering.

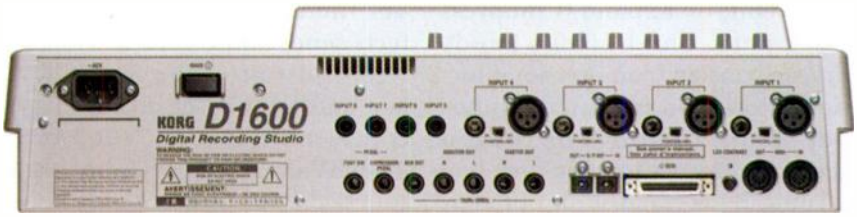


FIG. 1: The Korg D1600's rear panel boasts eight ¼-inch balanced inputs, four XLR jacks, and S/PDIF digital I/O.

AT YOUR FINGERTIPS

Serious equalization is crucial, both for the inputs and for processing playback tracks. For that reason, the D1600 includes high- and low-shelving EQ with an adjustable mid-band for every channel, all of which can be instantly accessed through the touch screen (see **Fig. 2**). If your applications call for more extensive EQ, you can assign graphic and parametric EQ programs as Insert Effects.

The D1600 includes an ample selection of onboard effects types that suit every recording and mixing application. You can select from the unit's 192 preset effects programs and the same number of user program locations. In every song, you can assign as many as eight insert effects, two masters, and a final processing effect. For recording guitar and other instruments, you can choose from 98 effect chains. The D1600's REMS modeling effects include microphone and guitar-amp simulations. An exclusive Expression Pedal input provides real-time control of effects such as wah.

The D1600 provides the convenience of an onboard autochromatic tuner. In addition to tuning your source instrument, it can also be used to check the tuning of prerecorded tracks. If you'd like a tempo guide that is not included in the D1600's 96 metronome sounds, you can dial-in one of 215 pulse-code modulation (PCM) Rhythm patterns. You can easily create Tempo Maps within a song, based on a multigenre collection of rhythm patterns, including fills, intros, and endings. You can insert as many as 200 Tempo Map events. You can listen to the metronome or rhythm patterns play while you record your instrument part or record the rhythm patterns to tracks.

In mixing applications, it is critical to be able to see and access channel faders and pan knobs quickly. The D1600 provides 16 channel faders and pan knobs on the top panel, giving you immediate access to recording and mixing operations. That eliminates having to use page menus to select fader groups and pan controls and allows you to concentrate on the mix.

BEND IT, SHAPE IT

The D1600's TouchView interface comes in handy when you need to find the exact location where audio data begins or ends. (The D1600 also offers Mode buttons, an Enter key, and a four-axis cursor for those who prefer to bypass the touch screen and do things the old-school way.) Just relying on your ears and a counter display won't always do the trick. When you press the Scrub key, you can set vertical and horizontal zoom ranges and pinpoint specific waveform regions in the display to quickly capture audio regions for editing (see **Fig. 3**). If you need to learn an intricate guitar solo that's been recorded, you can go to Scrub mode and press the FF key, and the audio data will play back at half speed, or an octave below the originally recorded pitch.

Just relying on your ears and a counter display won't always do the trick.

The D1600 provides track-editing functions such as copy, insert, erase, and delete. The Copy function lets you quickly copy one song's audio data from a Clipboard into a new song. An assortment of tools can help you polish your tracks even further: you can swap audio regions, or all data in tracks, with other tracks. You can also Reverse, Optimize, Normalize, Fade

Product Information

Korg
D1600
hard-disk recorder
$2,000

Contact Information
Korg USA, Inc.
tel. (516) 333-9100
Web www.korg.com

ADVERTISEMENT

In or Out, or Expand/Compress track data. The D1600's handy time-expansion/compression function allows you to match tempos between recordings or to fit a recording into a specific time.

You can take snapshots of fader, pan, EQ, effect, and aux settings at any point in a song for multiple scene recall. As many as 100 scenes can be quickly stored, named, and recalled for every song. Quick access to specific song regions is important, and the D1600 has the ability to store and name 100 Mark points and set 4 Locate points for every song.

The ability to go back and recall earlier song and track edits is a great benefit in digital-recording applications. The D1600 offers as many as 99 levels of undo, and thanks to TouchView, it's easy to view and undo edits. Program Play mode lets you set the playback order of your songs from both internal and external hard drives. Other important features include Rehearsal mode, Trigger and Auto-Punch recording, and Loop recording and playback.

Speaking of hard drives, the D1600 needs to keep cool during operation, hence the internal fan. You really don't need to listen to fan noise during recording and mixing, so the fan will automatically shut down at those crucial times.

GOING SOLO

The D1600 offers an easy and intuitive way to solo not only tracks, but the aux send, the effects send, and the return levels. Just press the Solo key, and you will see all 16-track buttons in the TouchView display. Then touch the desired button to solo a track. The Monitor Cue function is just as easy to work with. Sixteen monitor fader and pan settings can be set and viewed on one display page and used to feed an independent mix to vocal/isolation booths without affecting the main mix. You can send the metronome or PCM rhythm patterns to the monitor cue bus.

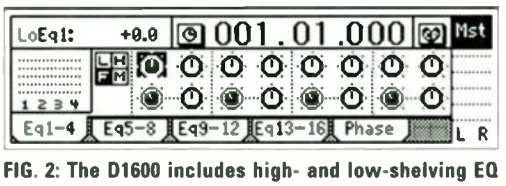


FIG. 2: The D1600 includes high- and low-shelving EQ that can be accessed through the unit's touch screen. Graphic and parametric EQ programs can be assigned as Insert Effects.

FIG. 3: Need to edit a tricky part of that otherwise perfect take? The D1600's Scrub mode can help you capture audio regions for editing.

You can concentrate on what's really important: being creative.

Korg's research revealed that users want an easy way to move data in their studio—to other recorders, keyboards, software-based recording systems, or even to bring drum loops, phrases, and other samples into the D1600. Korg developed a way to import and export WAV files, and with version 2.0 software, you can export multiple WAV files, as well as export to CD-R/RW media. (D1600 version 2.0 software is available for free download at www.korg.com.)

The D1600 ships with a 20 GB hard drive and a cartridge/bay system, which allows you to exchange drives easily when switching between projects. In case you fill the internal drive (62 hours of recording time for one 16-bit track) the cartridge/bay system accepts affordable IDE hard drives. In fact, the D1600 will accept hard drives with very high memory capacity (as much as a terabyte, when available).

For burning discs, you can use Korg's optional CD/CD-RW drive or purchase a general purpose ATAPI CD-R/RW drive used in desktop computers. (A list of compatible drives can be found at www.korg.com) With the CD-R/RW drive installed, you can burn your mixes to CD (multiple CDs with version 2.0 software) or backup/restore data. You can even play back and record from audio CDs.

When your application calls for sync control using MIDI Time Code, MIDI Machine Control, or MIDI Clock, the D1600 covers all the bases. If you need mix automation, D1600 parameters such as fader and pan values can also be transmitted and received through MIDI.

UNFETTERED CREATIVITY

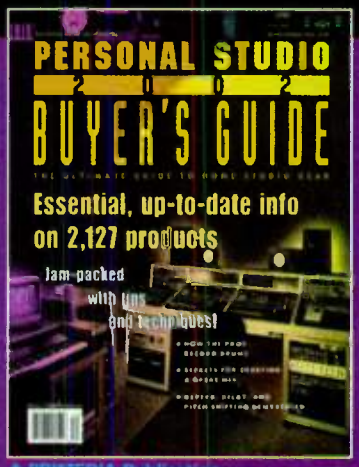
Korg's D1600 hard-disk recorder provides high-quality audio, deep editing features, a plethora of effects, and a handy touch screen. It lets you record as many as eight tracks simultaneously at 16-bit, 44.1 kHz. With the D1600's easily accessible functions, unlocking your creativity is only as far as your fingertips.

For the past 11 years, **Tom Norton**, *product training manager for Korg USA, has conducted product demonstrations and hands-on clinics designed to teach instrument dealers and end-users how to the get the most out of their Korg keyboards and recording gear.*

Electronic Musician presents

PERSONAL STUDIO 2002 BUYER'S GUIDE

THE ULTIMATE GUIDE TO HOME STUDIO GEAR



A PRIMEDIA Publication

Today's personal-studio owner has more equipment to experiment with than ever before, so choosing the right tools is a crucial step in developing recording skills and maximizing productivity.

The fifth edition of PSBG boasts pages loaded with the most comprehensive product specification charts available. Editorial features offer applications and ideas about creating the ideal personal-studio environment. Tips and tricks throughout the guide provide quick refreshers and new approaches to home recording.

Look for essential, up-to-date info about 2,127 products listed in 38 categories!

Editorial features and tech support throughout, including:

- Maximizing Your Mixer
- Creating the Ultimate Mix
- Getting a Drum Sound
- Power Hitters
- Ten Mastering Recording Tips
- Reviewing the Basics: Reverb, Delay, Compression, and Pitch-Shifting
- 300 Manufacturer Contacts

Personal Studio Buyer's Guide 2002 is available in music stores, bookstores, and wherever ***Electronic Musician*** is sold.

Order toll free in the U.S. at 800-441-0294; outside the U.S. at 913-967-1701.

Visit us online at www.emusician.com!

THE CHARTS

Analog Mixing Consoles
Audio Patch Bays
CD Recorders
Channel Strips and Voice Processors
Computer-Based Digital-Audio Workstations
Digital-Audio Converters
Digital Mixdown machines
Digital Mixing Consoles
Direct Boxes
Drum Machines
Dynamics Processors
Effects Processors
Equalizers
Headphones
Keyboard Synthesizers and Samplers
Microphone and Instrument Preamps
Microphones
MIDI Interfaces, Patch Bays, and Processors
MiniDisc and Cassette Multitracks
Modular Digital Multitracks
Modular Hard-Disk Recorders
Power Amplifiers
Reference Monitors
Sequencers
Sonic Treatment
Studio Furniture
Synthesizer and Sampler Modules
Synchronizers

ADVERTISEMENT

Breaking New Ground

Mackie's MDR24/96 and HDR24/96 take the lead.

By Zach Boyle

You've heard the same complaints and excuses time and time again: "It's too complicated. It's too expensive. The technology hasn't caught up."

Well, it's time to forget everything you have been told about hard-disk recording. Mackie's HDR24/96 and MDR24/96 destroy all preconceived notions about the subject. They're not only user-friendly and affordable, but the technology has caught up big time. Both boast Ultra-DMA hard drives and the ability to simultaneously record 24 tracks of 24-bit audio, and with the HDR24/96, you have nondestructive graphic waveform editing. This powerful digital duo offers a one-two punch for first-time recordists, as well as feature-laden tools for experienced professionals.

Since its introduction in 2000, the HDR24/96 has been steadily gaining acceptance from the professional recording community. The HDR24/96 is being used to track and record major albums, for film and TV scoring, and for live albums for artists ranging from Luciano Pavarotti to Green Day, Queensryche to Eric Clapton.

The Mackie MDR24/96 is the perfect hard-disk recorder for those who want high-quality audio from an unpretentious unit.

DOUBLE TIME

Mackie has recently introduced the MDR24/96, a price-busting commitment to nonlinear hard-disk recording. For those jumping into digital recording for the first time, or those replacing aging ADATs, the MDR24/96 is clearly the perfect choice.

Ready to go right out of the box, the MDR24/96's familiar analog-style controls and simple operation will have you up and recording in no time. Like the HDR24/96, it offers low-cost removable recording and backup drives that make saving and storing projects a breeze. Its nonlinear recording is nondestructive and uses the recorder's 20 GB hard drive more efficiently than linear or tape mode hard-disk recorders do. It has 24 tracks and 192 virtual tracks for as much as 100 minutes of continuous recording. In addition, basic cut, copy, and paste editing can be accessed from the front panel. With MDR24/96's 999 levels of undo, creativity comes without risk.

If real-time graphical editing is a must, the HDR24/96 delivers. But if you need a no-nonsense, high-quality hard-disk recorder, then look no further than the MDR24/96, which offers 24-bit, 96 kHz audio (with the use of external converters and PDI-8 AES/EBU I/O cards). Combined with the HDR24/96 and Mackie's Remote 48 controller, the MDR24/96 is the perfect low-cost, 24-track slave.

The MDR24/96 provides 24-bit, 48 kHz analog I/O; a 3.5-inch drive bay for importing tempo maps and software upgrades; a full meter bridge; and a 100Base-T Ethernet port. The MDR24/96 syncs to SMPTE, MIDI, word clock and video blackburst.

GOT YOUR BACKUP

In addition to the hard disks built into the HDR24/96 and MDR24/96, each unit has a pullout bay on the front for Mackie Media removable drives. Those cost less than a roll of 2-inch tape and give you more recording time. They're just as fast as the internal disk, so you can record directly onto them or use them for backing up your data.

Both hard-disk recorders let you choose among multiple storage options, such as the Mackie Media M90 external drive, which can hold 90 minutes of audio at 44.1 and 48 kHz rates and is considerably less expensive than SCSI drives. If you need to back up a few songs at a time, try the optional 2.2 GB Orb drive. In addition, there is a 100Base-T Ethernet port to back up to your computer and its media.

The units have two remote control options: Mackie's Remote 24 and the Remote 48. The Remote 24 is an "engineer-in-a-box" for performers doing their own recording. You can select and record tracks, set loop and punch-in points, meter record levels, and punch in and out with a footswitch. You can even "rock the reels" with traditional transport buttons.

The Remote 48 offers even more control. The professional remote controller can be used to control one or two HDR24/96 units or an HDR24/96 and MDR24/96 combo. The Remote 48 contains all the functions found on the front panel of both recorders—along with a weighted wheel for Jog/Shuttle transport operations and data entry, an autolocator with numeric keypad, Record Ready keys for 48 tracks, and a Current/Locate time display with visible cue numbers.

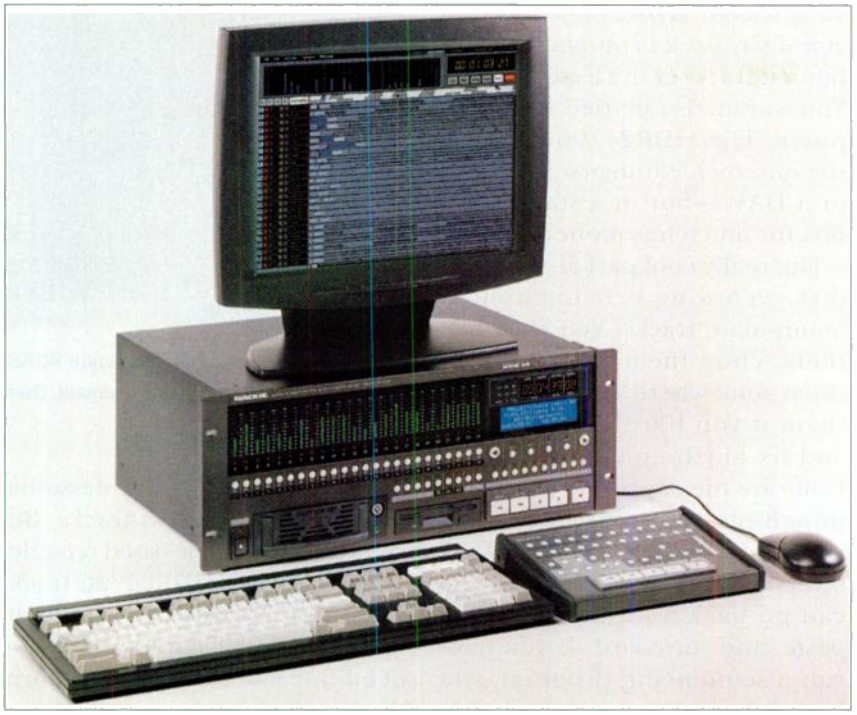


FIG. 1: The Mackie HDR24/96 system offers 999 levels of undo, solid track-editing, and an intuitive user interface. It also lets users do mouse-based editing on a monitor.

MEET THE HDR24/96

The HDR24/96 is a 4U rackmount hard-disk recorder with deep, generous onscreen waveform editing (see **Fig. 1**). The basic functions are accessible on the front panel; an LCD lets you scroll through major options. The controls are as intuitive and as easy to use as any analog tape recorder.

Input/output is on the same cards used in Mackie's Digital 8-Bus mixer. You can choose from analog, ADAT/TDIF, AES/EBU, or OPT8 (ADAT only). There are also ports for an SVGA monitor, keyboard, PS/2 mouse or trackball, footswitch (for punch-in/punch-outs), and 100Base-T Ethernet for transferring audio files to and from the HDR24/96 (see **Fig. 2**).

The SVGA monitor card deserves special mention. Getting a multitrack display to scroll past a central reference point requires a lot of computer and graphics-card processor overhead. Those tasks have been offloaded to a game-grade ATI Rage Pro video engine with horsepower out the wazoo. It makes the HDR24/96's display lightning fast and lets tracks scroll past a fixed timeline instead of jumping ahead a screen at a time. Extra card slots are included on the back of the recorder for upcoming additions from Mackie.

SAVE SOME DOUGH

So why don't you simply purchase a full-blown digital audio workstation (DAW)?

Well, why not? After all, it's only money. Although the established DAW systems are proven solutions, they are not cheap. You could buy

Product Information

Mackie Designs
HDR24/96
MDR24/96
hard-disk recorders
HDR24/96 $4,999
MDR24/96 $3,499

Contact Information
Mackie Designs
tel. (800) 898-3211
e-mail sales@mackie.com
Web www.mackie.com

ADVERTISEMENT

72 tracks of HDR24/96 for what you'd pay for 24 comparably configured tracks of the leading DAW. You would also be tied to a computer. The HDR24/96 provides the onscreen editing convenience of a DAW—but in a standalone box for much less money.

The really cool part about hard-disk recording is being able to manipulate tracks. You can slide them, chop them up, and paste them somewhere else. Crossfade them if you like. Then go back and fix anything you don't like. Gone are the days of sweating over punch-ins and punch-outs that you can't undo. The HDR24/96 offers 999 levels of undo, so you can go back and undelete, unpaste, and unrecord. If you have run a sequencing program, you know what that means—only this is with real live audio tracks. It boosts your creativity and productivity tenfold.

You can mark a segment of a track and name it as a region (or pick multiple nonadjacent parts of a track). Having accomplished that, you can cut, copy, and paste those segments anywhere—onto a blank track or right into the middle of a track without erasing anything. You can audition regions, modify their start/end points instantly, capture a region and turn it into another track, or replace multiple regions with a new region.

Using drag-and-drop crossfades, add your choice of three fade-in and three fade-out styles and nine different types of crossfades as fast as you can drag the mouse. When it comes to quantization, you can define a timeline grid and then snap your edits, moves, and inserts precisely to those points.

The HDR24/96 has eight virtual takes per track. Comping (doing multiple takes and assembling only the best parts) is the professional way to create flawless tracks. But comping with a tape-based recorder is a royal pain. HDR24/96 tracks expand to provide you with eight separate takes. Thanks to the ease of editing and onscreen waveform displays, you can slice and dice even the worst musician's best efforts into a thing of beauty. There's even a feature that allows you to loop and punch-in at the same time. Each new pass is recorded on the next virtual take. That lets you get coffee while the artist records eight overdubs.

FIG. 2: The rear panel of the Mackie HDR24/96 provides a 100Base-T Ethernet port, an SVGA monitor port, and a port for a keyboard. Users can also connect a PS/2 mouse or trackball from the unit's rear panel.

Gone are the days of sweating over punch-ins and punch-outs that you can't undo.

The HDR24/96 has hundreds of cue points and four locate points for looping and auto-punch-in modes. Cue points are visible onscreen and can be accessed from a sidelist as well. When you choose a cue, you don't have to wait for the tape to chug off to that point. You're there! The ultrapowerful built-in graphics card gives you the ability to instantly zoom in on a waveform and set excruciatingly precise punch-in and out points.

Compatible with AIFF and WAV files, the HDR24/96 allows you to transfer audio files through FTP and the HDR24/96's 100Base-T Ethernet port into a DAW for additional processing and editing. Then simply transfer the files back to the HDR24/96 for reliable playback.

DREAMWEAVER

The HDR24/96 and MDR24/96 can interface with any analog mixing console, including Mackie Designs' venerable, industry-standard analog Digital 8-Bus 248 and 328 consoles. But Mackie also designed the hard-disk recorders to function as seamless extensions of the Digital 8-Bus. Along with the obvious stuff such as being able to record HDR24/96 and MDR24/96 tracks directly from the Digital 8-Bus, there are nifty extras like being able to shuttle the recorder transport with the Digital 8-Bus's Jog wheel.

Slowly but surely, smaller studios and home recordists alike are catching on to Mackie's unique and innovative line of hard-disk recorders. The HDR24/96 and the MDR24/96 have put the questions to rest. With so many powerful features just waiting to be explored, what are you waiting for?

Zach Boyle *is a performing musician and technical copywriter at Mackie Designs.*

ADVERTISEMENT

Life in the Fast Lane

Tracking with Roland's VS-2480.

By Laura Tyson

When Roland debuted the VS-880 hard-disk recorder in 1996, few realized the impact the affordable 8-track would have on the world of home recording. These days, most project studios are centered around hard-disk recorders rather than tape-based studios—and for good reason. Hard-disk recorders offer conveniences like random access, nondestructive editing, onboard effects, and CD mastering.

Roland has once again opened a new door in digital recording with the VS-2480 24-track hard-disk recorder. Not only is it the first tabletop hard-disk recorder to provide 24-track playback, but it's also the first to offer mouse-based editing on the LCD and a handy VGA monitor output. But does the VS-2480 really give you the speed and flexibility of computer-based systems with the reliability and feel of a standalone workstation? I took one for a test drive to see what it's all about.

Roland's VS-2480 hard-disk recorder takes home-studio recording a step further by providing 24-track playback, mouse-based LCD editing, and the option of hooking up a VGA monitor.

REV IT UP AND GO

The VS-2480 can record 24-bit, 96 kHz audio. It provides motorized faders; as many as eight stereo effects processors (two included); both mouse and keyboard inputs (mouse included); a VGA monitor display output; 16 microphone inputs with high-quality microphone preamps (eight of those have XLR inputs and selectable phantom power); and two R-BUS ports for 16 channels of digital I/O using optional interfaces for additional analog, AES/EBU, ADAT, and TDIF compatibility (see Fig. 1). The VS-2480 records 16 tracks simultaneously and provides 384 virtual tracks per project. Don't let the word virtual confuse you: these are real, physical tracks you can record on. Just choose any 24 for simultaneous playback.

I set up the VS-2480 in my home studio for a blues-rock session that consisted of two keyboards, electric guitar, electric bass, acoustic drums, and two vocalists. Because I was going to use a lot of microphones, I appreciated the eight XLR inputs with phantom power. That's an area other hard-disk recorders often lack, so it's nice that Roland included high-quality inputs. (You can add an additional 16 XLR inputs using two ADA-7000 8-channel A/D/A converters.) The bass player forgot his direct box, so I just plugged his instrument into the VS-2480's dedicated guitar input and was set to go.

I was now ready to create a new project. I chose a 44.1 kHz sampling rate and, using an optional ASCII keyboard, named the project "Tyson's Blues." After a moment, the VS-2480 brought up the main Playlist screen, or Home.

ADVERTISEMENT

That's when I noticed a cool feature on the VS-2480—when I became unsure about where I was, I just had to press the Display/Home button. That took me back to the Home screen.

The next step was to route my inputs to the desired tracks, which you can do manually or with the EZ Routing templates. I opted to use EZ Routing and selected the Recording preset. To make sure I was recording everything properly, I set the VS-2480 to display input levels by pressing the Input button. That showed the level of each instrument.

The VS-2480's offers two built-in stereo effects processors (expandable to eight) that cover just about everything a modern studio would need, including reverb, delay, compression, EQ, and some fun stuff like lo-fi processing. But the Composite Object Sound Modeling (COSM) effects are what's really cool. They include amp, microphone, and speaker models. The guitar player didn't even need his noisy external pedals; he simply plugged in to the VS–2480 and used the COSM effects to create his tones. I employed an AKG C 3000 B microphone for vocals, and I tried some of Roland's mic modeling presets. Those let you try a variety of high-end microphones without having to actually own them.

HAVE NO FEAR

With all my tracks armed and ready to go, I pressed Record and Play. After a quick count-in by the vocalist, the music jumped onto the LCD and the 17-inch VGA monitor I had connected (see **Fig. 2**). Levels for every track being recorded bounced up and down in time with the source, and things breezed right along. After the last notes of the tune faded out, I saved the new tracks by pressing Shift plus Zero/Store, then pressing the Enter/Yes button.

The takes ended up great, but the lead vocalist wanted to record a slightly different version of her performance. The other musicians preferred the original take, but with 384 virtual tracks to play with, we could try several ideas and piece parts together for the perfect track. I chose a different virtual track for Track 7 and placed the other tracks in Playback mode. The Track Status buttons turned solid green. Thankfully, the vocalist impressed us with a soulful track that all but mixed itself. The mic modeling sounded genuine, as if the vocals were cut using a much more expensive microphone.

After I heard the results, I appreciated the extra processing power.

FIG. 1: The VS-2480's back panel offers mouse and keyboard inputs, a direct out for a VGA monitor, 16 microphone inputs, and two R-BUS ports.

Product Information

Roland
VS-2480
hard-disk recorder

Contact Information
Roland Corporation U.S.
tel. (323) 890-3700
Web www.rolandus.com

Everyone agreed that the last vocal take was indeed a keeper. But now the second vocalist wanted to use her first chorus harmonies throughout the rest of the song; she didn't feel the other performances were quite as good. This is when the VS-2480's mouse-based operation really came in handy. Rather than going through the typical process of multiple menus and edit commands—including setting the "to, from, and end" points for the copy source and destination—I could simply drag and drop the chorus wherever I wanted.

To do this, I first needed to select the track containing the region to be copied, so I left-clicked on Track 8-1, where the harmonies were recorded. Next, I selected the region I wanted (Chorus 1) by left-clicking to select the start of the chorus and then left-clicking again at the end. A right-click opened a pop-up menu that listed the available editing commands (Copy, Move, Insert, Cut, and so on). I selected Copy and released the button.

All I had to do was hold down Shift, left-click on Chorus 1, and drag it to the location of Chorus 2. Because I was copying Chorus 1 over a preexisting one, the original second chorus was automatically replaced with the new copy.

ADVERTISEMENT

(It's never really gone; there's always Undo.) Then I did the same for the rest of the choruses, all the while confirming my actions on my new best friend, the VGA monitor. That's the beauty of the VS-2480: with a mouse and monitor connected, it feels like you're working with software, though you're on a more stable, self-contained platform with a real control surface. With 999 levels of undo, you can edit without fear.

CHECK OUT THE SCENE

Now it was time for mixdown, and the VS-2480's 17 motorized faders and Scene memory really came in handy. If you've ever worked with an analog board, you know how difficult it can be to work on multiple projects or to re-create a mix if the board has been accidentally wiped. With the VS-2480, those issues are a thing of the past. Once you've set up a mix you like, push one of the Scene buttons, and it's saved. Feel free to move the faders, change the EQ, effects, and even signal routings. If you want to get back to where you were, just recall the Scene and voilà! The faders automatically move where they're supposed to be, and the mixer parameters are recalled as well. What a time-saver!

As I started mixing, I realized the bass needed a little massaging.

FIG. 2: The VS-2480 provides a direct out for a VGA monitor and mouse-based editing on the unit's LCD.

Every channel in the VS-2480 includes selectable dynamics. You can choose a compressor or an expander, or you can combine the compressor and expander for extra power. To warm up the bass, I turned on Track 14's compressor. After bit of tweaking, the bass smoothed out and started behaving better. I then applied EQ changes to shape the overall tone. Pretty soon I had a big bass tone from the gods. To be safe, I stored my mix into Scene 1.

I always like to ride the vocals, and the VS-2480 made this easy by letting me write real-time Automix data. I activated the Automix function, and the Ch.Edit buttons turned solid yellow. Holding the Automix button and then pressing the desired Ch. Edit buttons turned them to flashing red and placed them into Automix Record-Ready mode. I pressed and held the Automix button and then pressed Record to begin the Automix recording process. The Automix button was now flashing yellow. All that was left was to press Play and ride the fader for Track 1 until I managed to get it perfect.

Finally, I was ready to mix down the session. The VS–2480 made that a breeze by providing a dedicated Mastering Room. The Mastering Room is a special working environment in which you can mix down all 24 tracks—plus as many as 24 inputs—down to a 2-track master. After entering the Mastering Room, I inserted a mastering tool kit effect to polish the final mix. After I heard the results, I appreciated the extra processing power.

I pressed Record and Play, and the VS-2480 began recording a stereo master mix. The lead vocal track was automated, so I didn't have to worry about baby-sitting the faders during the mixdown. As the musicians hovered around me, I finished the session by burning the mix to audio CD using Roland's optional VS-CDRII CD recorder (see **Fig. 3**). With a dedicated CD-RW button for accessing the CD-writing functions, all I had to do was select the source tracks (I used the default tracks) and Disc-at-Once, which finalizes the disc by creating a table of contents. Discs created that way are Red Book–compatible and will play on any CD player.

FIG. 3: You can create Red Book-compatible audio discs of mixes with Roland's optional VS-CDRII CD recorder.

ALL TRICKED OUT

Here's the skinny on the VS-2480: 8 tracks are fine, 16 are better, but 24 is the ultimate. The VS-2480 provides 24 playback tracks; a monster 64-channel digital mixer with motorized faders; effects galore, including mic, speaker, and guitar amp modeling; mouse-based LCD editing and a direct VGA out; and professional features up the wazoo. This is where it's at.

A digital products training manager for Roland, **Laura Tyson** *spends much of her time instructing V-Studio owners around the United States through Roland recording clinics. She has a degree in music engineering technology and has worked with hard-disk recording and digital mixers since the early '80s.*

ADVERTISEMENT

Generation Next

This isn't your father's PortaStudio.

By Jeff Klopmeyer

When you think about an 8-track, 24-bit hard-disk recorder, the first word that comes to mind is probably not PortaStudio. That class of products is best known as Tascam's inexpensive, easy-to-use, cassette-based multitracks that gave many musicians their first experience in recording. However, the 788, which combines hard-disk recording, digital mixing, editing, effects, and more, fits the bill perfectly. Simple enough for a novice to operate but offering professional-quality sound and features, the 788 takes the PortaStudio paradigm and puts a 21st-century spin on it.

For those who want even more options, Tascam's MX-2424 provides in-depth recording and editing features. But first, I'll take a look at the 788.

Tascam's 788 hard-disk recorder continues the PortaStudio tradition by offering eight tracks and 999 levels of undo.

GREAT SOUND

Not too long ago, even the best professional digital recorders on the market were incapable of recording at 24-bit resolution. With the 788, 24-bit audio quality becomes a standard for all digital recorders, regardless of price. The 788 employs no compression to record and store 24-bit audio and employs high-quality 24-bit digital converters to ensure the cleanest capture and output of your signals.

The 788 provides 250 virtual tracks that you can use for comps, alternate takes, and more, which can then be mixed down to your 8-track multitrack master. Basic editing tools let you cut, copy, and paste parts of songs, and a waveform display in the LCD gives you a visual representation of your music. Make an editing mistake? No problem; the 788 provides 999 levels of undo. With built-in effects including reverb, chorus, distortion, multi-effects, as well as a 3-band parametric EQ, the 788 allows you to create entire productions that are ready to be mixed to CD.

The flexible 788 includes six analog inputs, two stereo outputs, two monitor outputs, two aux outputs, and a S/PDIF digital output (see Fig. 1). MIDI In and Out jacks are provided for syncing audio tracks to synthesizer and software-based sequencers or other devices that use MIDI Time Code, MIDI Machine Control, and MIDI Clock. Also, Tascam's CD-RW788 CD burner connects to the rear-panel SCSI port, letting you mixdown standard audio CDs or backup audio data from the internal hard drive.

BIG DADDY: THE MX-2424

These days, standalone 24-track hard-disk recorders are popping up like daisies in a springtime field. However, Tascam led the way with the MX-2424, which was announced at the 1999 AES show and started shipping in April 2000 (see Fig. 2). A year and a half later, thousands of musicians, audio engineers, and studios have made

the MX-2424 the most popular 24-track recorder on the market—and for good reason.

NUTS AND BOLTS

The MX-2424 is, as the name implies, a 24-track, 24-bit, 96 kHz hard-disk recorder. It has four ¼-inch balanced analog inputs and two ¼-inch unbalanced auxiliary jacks. Designed by Tascam and TimeLine, the MX-2424 was meant to supplement or replace aging 2-inch analog 24-track machines or modular digital recording systems and will fit in a 4U rackmount. Recording to an internal SCSI hard drive, users can extend the MX-2424's recording time by using additional hard drives that can be mounted in its front-panel drive bay or connected externally to a rear-panel SCSI port. Backup, which is a crucial component of any recording system, is accomplished using SCSI-based DVD-RAM or tape-based systems.

The MX-2424 offers a variety of editing tools that are accessible through the front panel and replicated on the remote control with no computer required. For visual-based editing, Tascam is poised to deliver its highly anticipated *MX-View* software, which has waveform editing, multimachine control, remote metering, and lots of other useful tools.

FIG. 1: The Tascam 788's rear panel has six analog inputs, two stereo outputs, and MIDI In/Out jacks for syncing audio tracks to synthesizers and software-based sequencers.

Although the MX-2424 includes AES/EBU and S/PDIF inputs and outputs, optional multichannel interfaces are available so users can choose the interfaces that work best in their studios. A host of synchronization tools are built into the MX-2424, including a SMPTE synchronizer for generating or chasing time code as well as word clock in/out/thru, MIDI In/Out/Thru, and video sync in/thru.

WORKS WELL WITH OTHERS

When you start working with the MX-2424, you choose between formatting its SCSI drive in Mac HFS/HFS+ or PC FAT 32 formats. With Macs, the MX-2424 uses the Sound Designer II format; on PCs, WAV is the file format of choice. Those formats were specifically chosen for their compatibility with digital audio workstations (DAWs), particularly Digidesign's Pro Tools.

Although most standalone hard-disk recorders can transfer files to and from your computer, the MX-2424 is the only recorder that offers time-stamped files for the Mac and PC platforms. Time stamping is a simple concept. Say you have a guitar solo in your song that starts at 3 minutes and 12 seconds. If you're importing and exporting into a DAW in a file type that does not support time stamping, your files all show up at the start of the tune. You're then faced with the near-impossible task of realigning the approximate time location of the track to its correct position. Not so with the MX-2424; the time-stamped files will pop up in your Pro Tools session just as if they'd been recorded straight into the computer.

This level of compatibility provides an excellent advantage to users of Pro Tools, Mark of the Unicorn's *Digital Performer*, Steinberg's *Nuendo*, and other DAW systems. Imagine being able to pack an MX-2424 into a 4U rackmount, taking it out of the studio for live sound and location recording, then bringing the files back to the studio where you can edit in the DAW environment you're comfortable with. The MX-2424's tape-machinelike feel can present a way of working that is not available from a purely computer-based system.

IT'S ALL ABOUT THE SOUND

When Tascam talked to musicians, engineers, and producers during the development of the MX-2424, one issue became apparent: sound quality was paramount in their choice of hard-disk recorders. With 24-bit, 96 kHz audio and the high-quality IF-AN24 analog-interface module, the MX-2424 meets all of the professional recording industry's expectations. Since its release, the MX-2424 has been chosen as the primary recording format for audiophile-quality classical, jazz, and soundtrack recordings. The IF-AN24 analog module can be used at the same time as your choice of digital interface modules (TDIF, ADAT, and AES/EBU).

Recently, the MX-2424's sound quality was put to the test on the scoring stage of Paramount Television, where a sound engineer

Product Information

Tascam
788 and MX-2424
hard-disk recorders
788 $1,149
MX-2424 $3,999

Contact Information
Tascam
Tel. (323) 726-0303
Web www.tascam.com or
www.mx2424.com

ADVERTISEMENT

used it to capture a studio orchestra for the show *Star Trek: Voyager.* Rick Winquest, the independent sound engineer who recorded the session, raved about the MX-2424. "Of course, the efficiency of the product is important, but the bottom line is, if it doesn't sound good, use it as an end table," Winquest said. "You can always argue about efficiency, but you can't argue about good sound. The converters on the MX-2424 are as good, if not better, than anything out there, excluding the most high-end converters. With this kind of music, you can really hear the quality of the A/Ds, especially with the high strings."

The MX-2424 records its audio files to Ultra 2 SCSI drives. SCSI drives are more expensive than their IDE counterparts, but their performance for 24-track recording is still considered the best for serious recordists. First on the list of advantages is the ability to hot-swap the drive between the MX-2424 and your computer without having to shut down the power of either machine. Second is a simple performance test. Just compare the punch-in/out ability of the MX-2424 with IDE-based recording machines. Across 24 tracks, the MX-2424 is capable of gapless, seamless punches because its high-speed SCSI drives are designed to provide 72 tracks of throughput: 24 tracks for playback, 24 tracks for recording, and 24 tracks of crossfaded audio.

CREATIVE POWERHOUSE

Along with its compatibility with Pro Tools and other DAWs, the MX-2424 offers excellent editing capabilities of its own. From the front panel you can perform editing maneuvers such as Cut, Local Cut, Left Cut, Left Local Cut, Copy, Paste, Paste Left, Multi Paste, Paste at Playhead, Clear, Open, Insert, Multi Insert, Split, Discard, Sync Paste, Sync Insert, Nudge Left, Nudge Right, Render, Redo, Undo, and Reverse. For even more editing power, users can connect a Mac or PC to their MX-2424 through its Ethernet port to take advantage of Tascam's new *MX-View* graphic editing software. A quick and responsive editor, *MX-View* was custom-designed for the MX-2424. *MX-View* offers the ability to view waveforms down to the sample level, letting users repair clicks and pops with the pencil tool, select and nudge audio events to the correct beat, drag-and-drop audio files with the hand tool, and fade, crossfade, and trim events on the fly.

FIG. 2: The 24-track MX-2424 provides 24-bit, 96 kHz audio and a wealth of editing tools.

The 788 takes the PortaStudio paradigm and puts a 21st-century spin on it.

In addition to replicating the MX-2424's extensive front panel controls, *MX-View* has a slew of new features and capabilities. It lets you transfer individual and groups of audio files to your computer and back, as well as back up projects. It also functions as a system interface for as many MX-2424s as you wish. Multiple MX-2424s can be displayed and edited on the screen simultaneously, and each machine's meters can be seen clearly from the *MX-View* windows, making it a thorough remote control interface.

Tascam's ample support tools set the MX-2424 apart from the crowd. Users can go to an online forum to get questions answered, and a dedicated Web site (www.mx2424.com) explains the MX-2424's features.

FROM DEMOS TO MASTERS

Whether you're a songwriter looking to quickly capture ideas with an easy-to-use interface or a composer seeking the sonic fidelity and creative tools found in nonlinear hard-disk recorders, the affordable Tascam 788 delivers it all, letting you save cash for more goodies for your studio.

If you want to explore the virtually limitless possibilities of a 24-track hard-disk recorder, the MX-2424 provides all the tools necessary for realizing your musical dreams. The sky's the limit.

Jeff Klopmeyer *is the self-proclaimed "King Marketing Weasel" of Tascam. He has almost 30 years experience as a musician and audio engineer. He's currently producing a holiday album for his wife, Anna, and teaching piano to his 2-year-old son, Nicholas.*

Accuracy – from A to B.

Genelec's Digital Double Play.

The 2029A
S/PDIF

The 2029B
AES/EBU

Today's audio control rooms and media production facilities are fast becoming all-digital environments. With the proliferation of digital workstations, the only tools which *aren't* digital are microphones and audio monitors. Until Now.

The **2029A** and **2029B Digital Active Near-field Monitoring Systems** are complete digital solutions that complement the interface from digital bitstream to acoustic energy. The extremely linear, integrated D-to-A converters circuitry used in both models offers a precision-matched electrical interface to the active electronics and amplifiers. This results in the best possible resolution and reproduction of your carefully-crafted, all-digital productions – whether they're from a desktop suite or a mega-studio facility. Developed from our highly-acclaimed **1029A** analog near-field monitor, the 2029A or 2029B can also be used in conjunction with our **1091A** subwoofer to create an incredible power-packed, full-bandwidth stereo monitoring system. The 2029A's are precision-aligned and balanced – from the single stereo 24-bit **S/PDIF digital input** – to their highly-efficient, 110dB/SPL matched drivers. The 2029A is 48kHz compatible.

The 2029B offers the same precision alignment with an **AES/EBU digital interface** on a digital XLR-type input. The 2029B is 96kHz compatible.

In both models, stereo listening level is controlled with a single, front-mounted adjust knob. And like any other Genelec Active Monitor, rear-mounted room response controls let you match the speaker's response to your room's response.

Want to hear what digital audio really sounds like? Audition the 2029A for an S/PDIF digital rig, or the 2029B for your studio's AES/EBU digital network – two more great reasons to invest in Genelec.

the whole truth and nothing but the truth™

GENELEC®
ACTIVE MONITORING

Genelec, Inc., 7 Tech Circle, Natick, MA 01760 • 508/652-0900 Fax: 508-652-0909 www.genelec.com

Complete CD packages in just 12 working days!

*Disc Makers gives you the fastest turn time available for CD replication – **your complete CD package, including design, insert printing, three-color printing on disc, CD replication, and packaging will ship in just 12 working days!** You get a complete package, not some stripped down version. No one does it faster. And **every Disc Makers CD package includes over $1,200 in extra services,** including a FREE UPC bar code for retail sales – a $750 value! – and 300 full-color, 11" x 17" posters for $99 – a $491 savings!*

Call today for a FREE Disc Makers catalog!
1-800-468-9353

DISC MAKERS®
CD, CASSETTE, AND VINYL MANUFACTURING MADE EASY

1-800-468-9353
www.discmakers.com

(continued from p. 98)

The change in impedance is proportional to the *square* of the turns ratio. For example, if the turns ratio of a transformer is 10:1, the impedance changes by a factor of 100. However, a transformer has no intrinsic impedance; instead, its impedances are determined by the impedances of the devices connected to it. Specifically, the output impedance of the source device (say, a guitar) is modified by the square of the turns ratio to calculate the transformer's output impedance. Likewise, the input (load) impedance of the destination device (say, a mic preamp) is modified by the square of the turns ratio to calculate the transformer's input impedance.

For example, the normal input impedance of a mic preamp is 3 kilo-ohms (kΩ). If the input to that preamp is connected to the output of a 10:1 step-down transformer, the transformer's input impedance becomes 300 kΩ. If you were to connect the same transformer to a mic preamp with an input impedance of 1.5 kΩ, the input impedance of the transformer would be 150 kΩ.

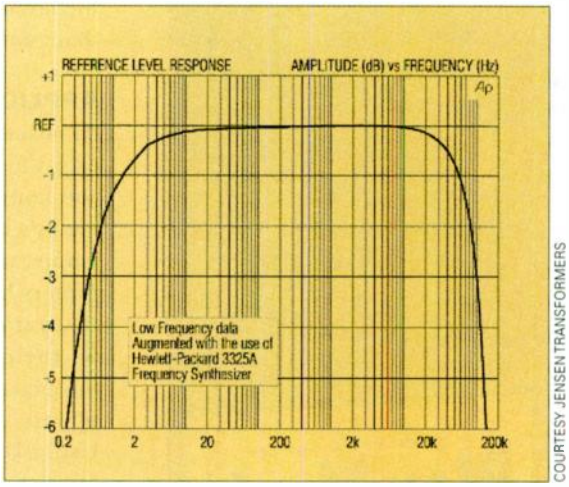
Most audio transformers have a metal core constructed from thin E-shaped laminations. The core provides a magnetic path to couple the primary and secondary coils (that is, it facilitates the transfer of magnetic energy between coils). Without that core, the transformer would have no low-frequency response below about 10 kHz.

In high-quality audio transformers, the core material is an 80 percent nickel alloy (commonly called Mu-Metal), which provides the best low-frequency response and lowest possible distortion. Lower-cost transformers use a 50 percent nickel alloy, and steel is used in the cheapest transformers. Steel is also used in high-power transformers, such as guitar-amp output transformers, because of its higher level-handling characteristics.

FOR EXAMPLE

To illustrate the previous concepts, consider the Jensen JT-DB-E, a 12:1 step-down transformer used in many DI boxes. It has a low-frequency response that is 3 dB down at 0.6 Hz as well as a high-frequency response that is 3 dB down at 100 kHz (see **Fig. 2**). (Frequency response is often specified with *3 dB down points*, which are the frequencies at which the device's response is 3 dB below the nominal level.)

Why would you need a transformer with a 0.6 Hz to 100 kHz frequency response? For one thing, the transformer is basically transparent (which means it exhibits a very flat frequency response) in the audio range. It also ensures a flat phase response (the phase relationship between different frequencies remains constant) in the audio range (see **Fig. 3**).



COURTESY JENSEN TRANSFORMERS

FIG. 2: The Jensen JT-DB-E transformer's frequency response is 3 dB down at 0.6 Hz and 100 kHz and very flat in the range of 20 Hz to 20 kHz.

Phase response affects the fidelity of the output waveform and the relative delay of different harmonics (which is also known as *time alignment*). Poor phase response results in a lack of localization, clarity, and imaging. Maintaining a flat phase response from 20 Hz to 20 kHz requires a flat frequency response between at least 0.8 Hz and 50 kHz and higher if possible. A high-frequency response as high as 100 kHz is fine for audio requirements; 200 kHz is state of the art.

The JT-DB-E's usual input impedance is 200 to 400 kΩ, depending on the preamp's input impedance. That's fine for a synth, but it might seem a bit low for a guitar. However, if the DI box's input impedance is in that range, it helps roll off the excessive brightness that often occurs when a guitar is connected directly to a mixer through the DI box. The transformer's output impedance depends on the source device, but its typical value is 150Ω, which is ideal for a mic-preamp input.

OTHER COMPONENTS

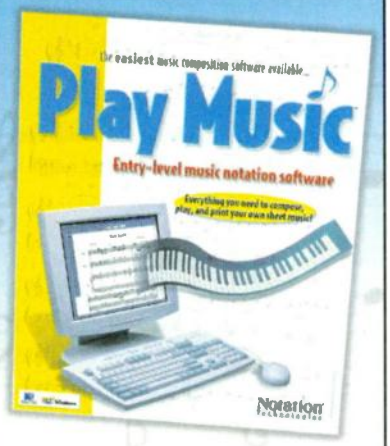
Some DI boxes, such as the Whirlwind HotBox, do not use transformers. Instead, they use active electronics for level and impedance matching. (*Active* electronics include semiconductor components, such as integrated circuits, whereas transformers are a type of *passive* component, like resistors and capacitors. Active direct boxes require power from a wall outlet or battery, and passive transformer–based DI boxes need no power at all.) The HotBox has an input impedance of 10 MΩ, which improves the frequency response at both ends of the spectrum.

In addition to a transformer or active electronics, many DI boxes include a ground-lift switch, which helps eliminate ground loops in certain equipment. A wide variety of good and bad techniques exists for designing and manufacturing audio equipment, and ground-lift switches can help compensate for bad designs.

If you run a guitar directly into a mixer through a DI box, it can sound bright. As a result, DI boxes often include a switchable lowpass filter that simulates the rolloff of a guitar-amp-and-speaker combination. The speakers in a guitar cabinet generally don't have much response above 3 to 5 kHz, so the filter normally rolls off above that frequency range.

Some DI boxes, such as the Whirlwind Director, include an input attenuator that allows you to connect the speaker output from a guitar amp to the mic input on a mixer through the DI box. That lets you include the compression and distortion components of

It's about time.
It's about music.
It's time for Play Music™



It's $49.95.

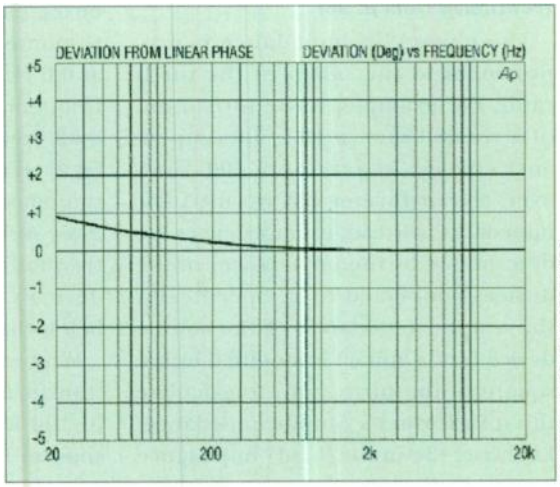
Stop wasting time learning music software programs and start having fun composing, playing, and printing your own compositions! **Play Music** gives beginners and professionals alike everything they need to create their own music. Simply open the program and start playing; the notes will appear on your computer screen. *It's that easy!*

24 staves... 8 voices per staff

Notation Technologies

4887 Church Road
Doylestown, PA 18901
215-794-5886
Fax: 215-794-7115
www.notationtechnologies.com

the amplifier in the signal that goes to the mixer.



COURTESY JENSEN TRANSFORMERS

FIG. 3: The phase response of the Jensen JT-DB-E transformer is very flat in the range of 20 Hz to 20 kHz, deviating only 1 degree in the low end.

APPLICATIONS

DI boxes are helpful in several ways beyond letting you connect a guitar to a mixer's mic input. For example, many home-studio owners have lots of synths that eat up the line inputs on their mixer. However, the mixer might have plenty of mic inputs available. Using DI boxes, you can bring the signals from extra synths into the mixer using the open mic inputs.

One of the most common applications for DI boxes is to connect equipment with high-impedance outputs (such as synths) to a mixer's low-impedance inputs using long cables (such as snakes or studio tie lines). Cables that must run a considerable distance should always be balanced and low-impedance to minimize signal loss, induced noise, and grounding problems.

If you were to run a long cable (say, 100 feet) from a guitar to an amp, it would completely load the guitar; you'd lose high-frequency response and add noise. However, if you connect the guitar to a nearby DI box with a short instrument cable, you can then run a 100-foot mic cable to a mic preamp near the guitar amp. The mic preamp's output is then connected to the input of the amp.

Instead of using a mic preamp in such a situation, you could use a less expensive *matching transformer*, which is usually a 1:10 step-up transformer used to connect a low-impedance mic to a high-impedance input, such as a guitar amp. Matching transformers are normally housed in barrel-type cases with a female XLR connector on one end and an unbalanced ¼-inch plug on the other.

Such a transformer works best if it "sees" a few hundred kilo-ohms as a load, which means a typical 10 kΩ line input does not provide enough input impedance, but a 1 MΩ guitar-amp input is fine. Using the "square of the turns ratio" rule in reverse (remember, this is a step-*up* transformer), a 10 kΩ load on the transformer's output would present a 100Ω input impedance to the signal from the DI box, which is far too low. However, a 1 MΩ load would present a 10 kΩ input impedance to the signal from the DI box, which is sufficient.

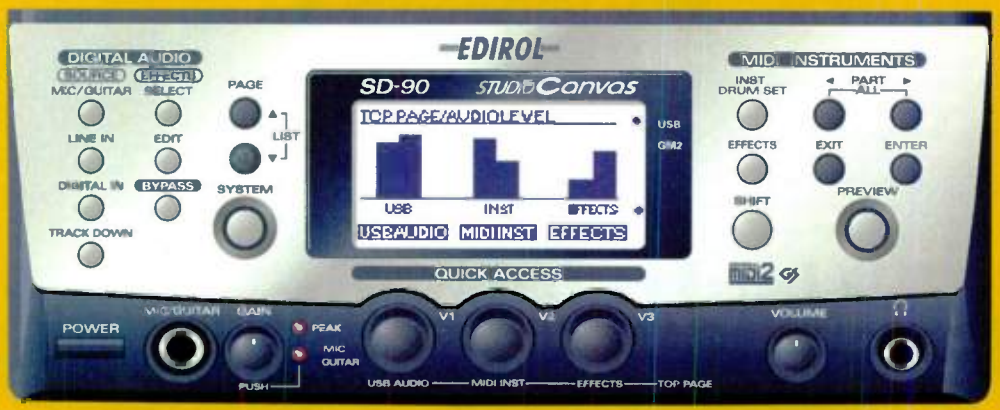
Unfortunately, most matching transformers are not very high fidelity. Because the transformer must fit within a barrel-type housing, it isn't large enough to produce good low-frequency response. In addition, those transformers exhibit lots of phase distortion in the lower midrange and bass ranges. They're okay in noncritical applications, but you wouldn't want to use them in the studio.

DI boxes are one of the unsung heroes of electronic music. They can help improve your sound in many ways, but many people don't understand how they work or how to use them. Hopefully, you can now appreciate the important role that DI boxes play onstage and in the studio and begin to use them in your setup.

Scott Wilkinson *recently purchased a DI box for his wife's Martin guitar with a built-in pickup and preamp.*

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

This is the only thing missing from your home studio.



- Capture/record digital or analog audio
- Edit tracks/mix/master
- Add dynamic effects (delay, reverb, etc.)
- Publish to tape, CD or web based delivery

From the people who built the first digital audio interface & MIDI tone module – comes the **SD-90 Studio Canvas**. Connect this compact unit to your computer via **USB** and you have a professional quality digital audio workstation. Works with a variety of popular recording/sequencing software. Occupies a very small space. Makes huge amounts of music. Just add your imagination.

- Create original music with MIDI tone module
- 1,024 instruments
- 36 drum sets
- 128 note polyphony
- 32 part multi-timbral
- Use your favorite MIDI controller

Edirol is your complete DeskTop Media Production resource. Check our selection of: MIDI Controllers • USB MIDI Interfaces • USB Digital Audio Interfaces • Digital Audio Software • Amplified Audio Monitors • Digital Video editing and more...

Specifications: USB interface to computer • 24bit/48kHz AD/DA converters • Coaxial/optical S/P DIF I/O • 1/4" guitar/mic input • Stereo RCA I/O • 2 mono RCA out • 2 MIDI I/O • GM2/GS compatible • Rich Sound Source selections • ASIO 2.0 (WIN/MAC), MME (WIN), Sound Manager (MAC)

For more info: www.edirol.com
Email: sales@edirol.com

Toll-Free: 800 380-2580
Voice: 360 594-4273

EDIROL

Follow the Money

Where is the money in a record deal from, and where does it go?

By Eric Leach and Bill Henslee

Money gets a bad rap. You've heard the clichés: money is the root of all evil, money can't buy happiness, and so on. Money itself can't be bad—it's just a thing, like a rock, a chair, or a blender. It's the pursuit of money that gets people into trouble. People who enjoy making money are often labeled as superficial, shallow, and greedy. That's why you never see "money" on the Playmate of the Month's list of favorite things. That's why professional athletes embroiled in contract disputes always claim, "It's not about the money."

JACK DESROCHER

Record companies are often characterized as the ultimate embodiment of money-grubbing evil. Unfortunately for them, the Napster unpleasantness has merely exacerbated that characterization. In fact, many people think record companies are just plain bad. Why is that? Certainly, record companies exist to make a profit, but so do most companies. Perhaps it's because of the way record companies make their money: they make it from our heroes, the musical artists.

All notions of musical parasitism aside, record companies perform the critical functions that allow artists to reach the masses. That's fine, you say. The problem with the record companies is that they're too greedy. You see them selling millions of albums at $15 to $18 a pop. Where do the truckloads of cash go if not into some big-shot executive's pocket? What about artist advances and money for marketing and promotional budgets? Where does all that money come from? Who gets what along the way? In this column, we will look at how record companies work and how the money finds its way from the consumers to the artists and everyone else who works to get the music to the public.

"We made $18,973 from Film and TV deals we got through TAXI"

Jennifer & Scott Smith -- TAXI Members

For the longest time, my wife Jennifer and I were skeptical about TAXI. What songwriter, artist or band in their right mind would pay to have their material pitched?

Truth be told, we really didn't understand how TAXI worked, because we didn't take the time to get all the facts.

After a friend told us he had a great experience using TAXI, we called and got the information kit. The more we read, the more TAXI made sense to us.

Although we were still a *little* bit hesitant, we took the plunge and joined. We knew that TAXI offered a money-back guarantee.

That didn't mean they would guarantee us a deal, but it *did* mean that they stood behind the service they promised.

I've got to admit, we were very impressed. TAXI's staff was extremely professional, and they delivered the goods.

A few months later, we landed our first placement in a TV show. And the deals just kept coming -- one after another.

So far, we've made $18,973 from Film and TV deals TAXI helped us get.

Okay, so we haven't sold a million records *yet*, but we're making money with our music while we're working toward that goal.

Can TAXI do that for *you*? That all depends on your music.

TAXI proved to *us* that if your music is great, they really *can* get it to all the right people.

TAXI®

The Independent A&R Leader

1-800-458-2111

But TAXI is much more than an excellent way to shop your music.

The written feedback you'll get on your material is like having a team of industry veterans as your own personal coaches.

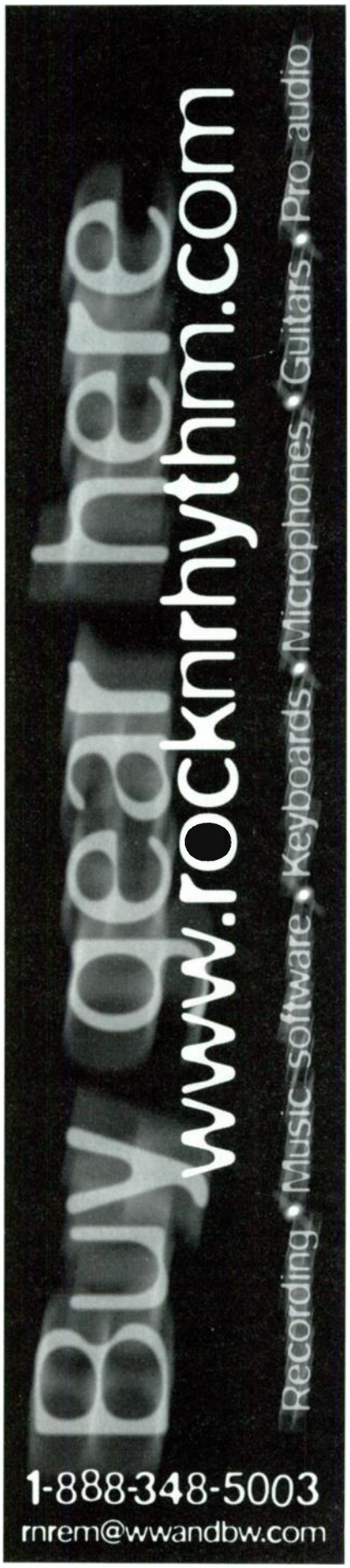
You'll also get TAXI's highly acclaimed newsletter, and a FREE pass for you and a guest to attend TAXI's annual convention, "The Road Rally."

This private convention is the best we've ever been to, and worth *much* more than the price of your membership.

So, don't just "think" you know what TAXI is all about. Take a little time to find out about all the ways it can help your career.

Whether you're pitching yourself as an artist, pitching your songs, or going for Film and TV placements, TAXI is a *great* vehicle.

Pick up the phone, and get their free info kit. We did, and we're really happy with the results!



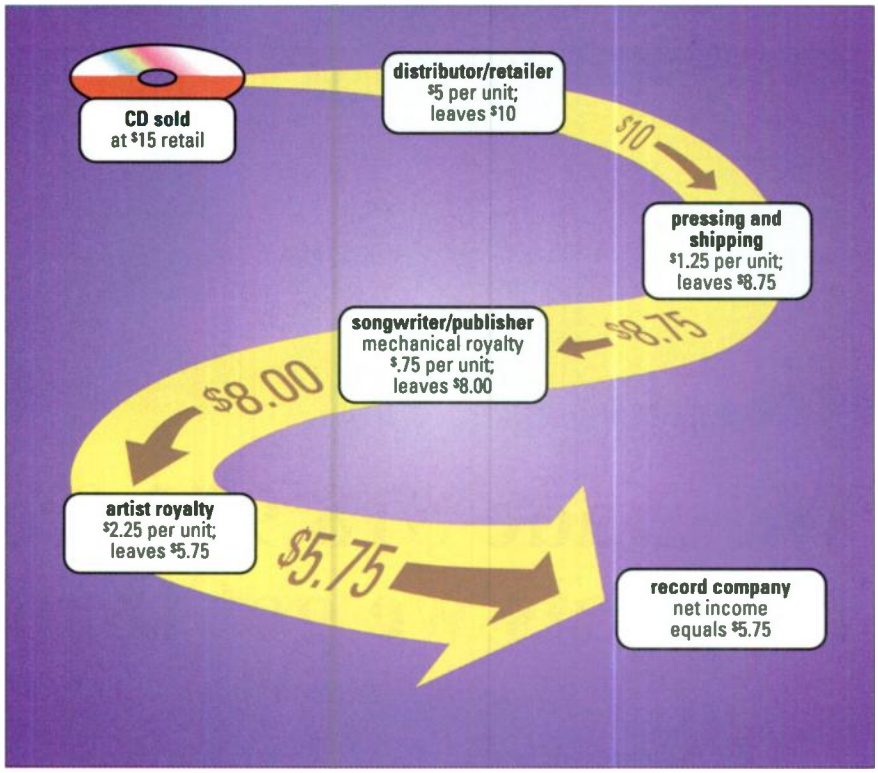


FIG. 1: This diagram illustrates a breakdown of who gets what from the sale of a single CD.

LABELS 101

In their most basic form, record companies are like music venture capitalists with production, marketing, and distribution arms. They locate, finance, and develop new talent; oversee music production; market the music through promotion and advertising and by securing airplay; and distribute the finished product through retail outlets and online services. That is expensive stuff, and risky too: only about 5 percent of new artists even sell enough records for the record company to break even, and as few as 5 to 10 percent of a label's artists pay for all of the music released by the company.

Before looking at the math behind record deals, a brief disclaimer is in order: the following numbers are generalizations based on a mainstream artist at a major record label. Every negotiated record deal contains different terms and conditions of payment.

IT TAKES MONEY . . .

When a label signs an artist, the record company advances the recording budget to the artist at no risk. If the album fails to sell, the artist is not personally responsible for paying the money back. The record company recoups its investment in the album only if the public buys it. However, the artist does not see any money from the album sales until the label makes back its investment.

A typical recording budget for an artist's first album is between $250,000 and $1 million. The record company will also spend approximately $250,000 to $500,000 to market a new artist to the public. Pressing the album and shipping it to retail outlets costs from $1 to $2.25 per unit, depending on the size of the pressing (more units cost less per unit). A new artist typically receives between 12 and 16 percent of the album's suggested retail price as a royalty. In addition to those costs, the record company must pay royalties (called *mechanical royalties*) to the music-publishing company for every unit sold. The record company usually caps its mechanical royalty costs at $0.755 per album (10 songs at $0.0755 per song). To recoup those expenses, the record company receives a wholesale price for

DOUBLE PLATINUM

On the charts, in concert and around the dial — TRITON rules. It's the music workstation that's inspiring more cutting-edge music than anything else. Realize your own platinum-selling dream with the extraordinarily musical TRITON.

Now available — "Orchestral Collection" Expansion Board Set
32 MB of PCM/256 Programs/256 Combinations

Electronic Musician
2000
EDITORS
CHOICE

KORG

©2001 Korg USA. For your Korg dealer: (800) 335-0800. Faxback info: (631) 390-8531
Doc # 3502 & 3503. www.korg.com. Order the Video User's Guide for $19.95

each unit sold by the distributor from $7.50 to $11.50 per album, depending on the genre and artist. (For a look at where the money from a single CD sale goes, see **Fig. 1**).

With those numbers in mind, we can make some assumptions and show why every record an artist releases is a risky investment for the record company. If the artist receives a $250,000 advance and the record company spends $250,000 on marketing, the record company has spent $500,000 dollars before one album has been sold. If the record company receives $10 per unit from the distributor and has to pay $1.25 for pressing and shipping and $0.75 for mechanical royalties, the record company ends up with $8 per album ($10 income minus $2 pressing, distribution, and mechanical royalties) before deducting the artist's royalties. Assuming a suggested retail price of $14.99 and an artist royalty rate of 15 percent, the record company owes the artist approximately $2.25 per unit sold. After deducting the artist's royalty, the record company's net income from the sale of the record is approximately $5.75 per unit sold. The record company must then pay for its overhead and all of the albums that don't sell well enough to pay for themselves $5.75 at a time. For that hypothetical album, the record company must sell 86,957 units to cover its out-of-pocket costs, which do not include the everyday costs of running an international business. Although 86,957 units may not sound like many units to sell, only about 16 percent of all record releases reach that sales figure.

TO MAKE MONEY

So what about the artists? They're really raking it in, aren't they? Well, yes and no. Huge stars make lots of money, but most artists, even if moderately successful, generally struggle to make a buck. First of all, the artist won't see any royalty money until the record company recoups its advance production budget. To further complicate the math, the artist usually must pay 3 percent of the royalty to the record producer. Deduct the 3 percent from the royalty rate, and the record company recoups its $500,000 advance at $1.80 per unit sold. Therefore, the artist won't begin seeing money from sales until 277,778 units are sold, and only about 3 percent of records ever reach that sales figure.

At least he or she will have fun with the advance money, right? You've heard about the parties artists throw when their big advances come in. Actually, that $250,000 represents a relatively small cost-of-living budget, even if the album sells relatively well. Assuming that no management, attorney, or other professional fees were paid from the recording budget, which would never happen, the artist will probably spend $200,000 of the $250,000 advance on actual recording costs. That leaves $50,000 to split among the band members. If the band has five members, each member receives $10,000 to live on until the album recoups its budget, as calculated above. That time period is generally about a year to 18 months if the album sells well.

Furthermore, those calculations don't include the money that the band must pay to its legal team or management for the deal. Lawyers typically charge an hourly rate (from $175 to $350) or a percentage of the artist's total gross income (between 3 and 10 percent). Managers typically charge between 15 and 25 percent of their client's gross income. Accordingly, the manager and the lawyer could easily end up with $75,000 of the $250,000.

OTHER MEANS

Before you run out to loan Metallica some money, keep in mind that other streams of income are available for reasonably successful artists. For example, artists can earn money from touring, though most bands tour primarily to support album sales and airplay. Also, some artists can make money through endorsements and other marketing strategies. However, the best opportunity for artists to make serious money is to write their own songs. I'll never forget seeing the lead singer of a moderately successful band flying first class while the rest of the band was condemned to coach. You can guess why: he was the songwriter.

The primary source of income for artists who write their own songs is mechanical royalties. Typically, a performing songwriter owns his or her own publishing company. That company enters into a copublishing agreement with a larger publishing company whereby the two companies co-own the copyrights to the songs. Of the mechanical royalty income, the songwriter receives 50 percent, the songwriter's publishing company receives 25 percent, and the larger publishing company receives 25 percent.

Assume that all of the songs on the hypothetical album are administered by a single publishing company (in a copublishing deal with the songwriter's publishing company), and that, according to the mechanical royalty projections laid out previously, $0.755 total mechanical royalty income is generated per album sold. Of that amount, the songwriter is paid 50 percent($0.3775). Of the remaining publisher's share, the songwriter's publishing company and the larger publishing company each receive $0.18875 per album sold. In the end, the songwriter receives a total of $0.56625 per album sold ($0.3775 plus $0.18875), and the publishing company receives $0.18875 per album sold.

Furthermore, the publishing company and the songwriter make money from any public performances (for example, airplay and live cover performances) of the album's songs. Although public-performance income is difficult to hypothetically quantify, approximately $0.013 to $0.014 is generated per public performance. That money is divided among the publishing companies and the songwriters. Public performance income is generally not as significant as mechanical royalty income, but think about how many times you hear a popular song on a single radio station in a single day and multiply that by the number of similar format stations around the world.

Songwriting money can add up fast. For the songwriter, an album that sells a million copies generates $566,250 in mechanical royalties alone and added income from airplay, which is above and beyond what the band members in coach are making.

That's where the money goes. Hopefully, those figures will help you realistically assess your risks as an artist or songwriter and maybe go a little easier on the record companies. For better or worse, selling music is and always will be a business. Caveat emptor!

Eric Leach *is an intellectual property and business law attorney at the firm of Goodman and Leach. He can be contacted at eleach@goodmanleach.com.*

Bill Henslee *is a professor at Pepperdine University School of Law, where he teaches copyright and entertainment law. Contact him at william.henslee@pepperdine.edu.*

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

The Dawning of a New Sound

SRS Pro 220 Sound Retrieval System

SRS (Sound Retrieval System) is an award-winning patented technology that retrieves the spatial information from any stereo recording and restores the original three-dimensional sound field.

Also, use the SRS Pro 220 to convert mono to 3D stereo.

SRS PRO 220 APPLICATIONS

- Recording
- DJ Systems
- Audio Post Production
- Live Performance

"Not only does the audio enhancement of the SRS processor complement any program material, it reveals subtleties and detail that I have not heard before. Bravo — it is truly a remarkable device."
Edward Greene, independent audio contractor

"SRS creates width and depth in my recordings that were next to impossible to create before."
Chris Gibson, Micworks

SRS
www.srslabs.com

Available at a store near you,
or call 1-800-2HEAR3D
[1-800-243-2733]

SRS by SRS

©2001 SRS Labs, Inc. All rights reserved. SRS and the SRS symbol are trademarks of SRS Labs, Inc.

Everything Else is Only Stereo

Akron Music, OH • Brook Mays Music, TX • Chapperell's Music, NM • Coast Recording, CA
Dave Phillips, NJ • Pro Sound Music, CO • West Music, IA • Westlake Audio, CA

REVIEWS

132 Tascam 788 Digital Portastudio

142 Roland XV-5080

150 MOTU 828 (Mac/Win)

156 Professional Sound Projects StereoPack and MixPack (Mac/Win)

162 Waves Gold Native 3.0

172 PreSonus DigiMax

178 Starr Labs Ztar Z1 and Z1-S

184 Quick Picks: Sonic Implants *Afro-Cuban Percussion* (GigaSampler) sample CD-ROM; IK Multimedia *T-Racks* 24 (Mac/Win) mastering software; Sonic Foundry *World Pop Loops for Acid* sample CD-ROM

TASCAM

788 DIGITAL PORTASTUDIO

The Portastudio legacy continues in the digital domain.

By Mark Nelson

Housed in a shiny silver-topped case with a backlit LCD, the Tascam 788 Digital Portastudio records 8 tracks of uncompressed 44.1 kHz audio at 16- and 24-bit resolutions. Dedicated faders are provided for monaural tracks 1 through 6, and you can link adjoining faders to form stereo pairs; a single stereo fader controls tracks 7 and 8 (see Fig. 1).

With two internal multi-effects generators, 250 virtual tracks, multiple levels of undo, and a generous array of routing, MIDI, synchronization, and nondestructive editing options, this all-in-one hard-disk recorder offers an impressive degree of flexibility. The 788's design reflects a thoughtful balance of simplicity and depth. Commonly used functions require no more than one or two button pushes, yet a great deal of power lurks just below the surface.

Many common functions can be accessed directly from the front panel, and several buttons offer alternate menus when the Shift button is pressed. The buttons and knobs are clearly labeled, and the Shift functions are

FIG. 1: The Tascam 788 Digital Portastudio sports an easy-to-use interface combined with flexible I/O options and two built-in effects processors.

From the creators of the finest synthesizers in the world comes the world's most powerful effects processor.

Kurzweil

ksp8

- Process 8 channels simultaneously, with 24-bit precision
- Over 700 world-class digital effects
- Flexible input/output configurations
- Ready for 5.1 surround processing
- Patchable modulation architecture for real-time control
- Optional dedicated controller for remote operation

KURZWEIL®
Music Systems

Kurzweil Music Systems
9501 Lakewood Drive, S.W., Suite D
Lakewood, Washington 98499
253-589-3200
Fax: 253-588-6809
www.kurzweilmusicsystems.com

Canadian Division
3650 Victoria Park Avenue
Suite 105
Toronto, Ontario M2H 3P7
416-492-9899
Fax: 416-492-9299

indicated by a turquoise box. I rarely had to delve too far into the menus, and finding my way back was a snap. Pressing Exit/No takes you back one level; the Home/Esc button jumps to the main screen. After a short time, I abandoned the manual and just looked for the appropriate buttons to press.

I used the 788 in a variety of recording situations: as a simple sketch pad for song ideas, in a live drum session, as a demo tool for a Celtic-pop project, and interfaced with samplers and sequencers to create a fully produced mix.

The review unit arrived with a 7.5 GB hard drive, but Tascam plans to upgrade to a 10.2 GB drive by press time. The total recording time varies depending on the resolution, the number of tracks, and other factors, but even with the smaller drive, the 788 provides well over three hours of 8-track recording and playback at 16-bit resolution. If you need more, the unit supports archiving options through its SCSI-2 mini-50 port. You can back up and restore track data and setups using external hard drives and removable media; however, the 788 uses a proprietary file-management scheme, so the drives must be formatted with the 788's operating system. (You can also target external hard drives as the record media.)

In addition, your finished works can be mixed down internally and burned to a CD using a Tascam-approved CD-R or CD-RW drive connected to the SCSI port. At present only Tascam's CD-RW788 ($449) is supported.

INS AND OUTS

The 788's rear panel sports six ¼-inch input jacks that serve a variety of purposes (see **Fig. 2**). Four balanced jacks (inputs A, B, C, and D) operate in a range from microphone (–50 dBu) to line (+4 dBu) levels. Input D is switchable between mic/line and instrument sources, eliminating the need for a direct box when connecting a guitar or bass. Two unbalanced auxiliary inputs (–10 dBV) are handy for keyboards or returns from external effects boxes.

Tascam thoughtfully provides a pair of XLR-to-phone adapters (impedance transformers) to compensate for the lack of XLR mic inputs. Using adapters may not be the ideal solution, but having them in the box might save you a trip to the store. The lack of XLR inputs also means that phantom power is not provided. Given the features-to-price ratio, that's not a significant problem.

The rear panel also provides a pair of unbalanced ¼-inch auxiliary outputs (–10 dBV), RCA master and monitor outputs, a ¼-inch footswitch jack, and a headphone output. Rounding out the rear-panel connections are MIDI In and Out jacks, the aforementioned SCSI port, and an S/PDIF output.

SONG FORM

A 788 session is called a Song. Songs contain the recorded tracks, virtual tracks, edits, effects settings, mixer scenes, location points, and the complete undo history since the beginning of the session.

Pressing the Menu button and selecting Song opens a submenu where you can choose between 16- and 24-bit resolution (44.1 kHz is the only sampling rate supported). Opting for the higher resolution on the 788 does not prevent you from mastering your opus as it does on some desktop studios: the 788 dithers the audio when premastering for CD.

Aside from the usual copy, load, protect, and erase functions, the Song menu provides a handy Save function that works in much the same way as the Save command in a word processor. It saves the current data and settings so you can revert to that state later if you don't like the subsequent changes to the Song.

Editing on the 788 is straightforward and easy. The Edit mode menu lets you cut, copy, paste, insert, delete, and move selected regions, and you can add silence to a track or clone an entire track. Edit operations work only on the eight active tracks, however, so comping a take from multiple virtual tracks requires temporarily assigning each to an active track.

Each Song has as many as 999 levels of undo and redo; the 788 keeps track of recordings, autopunches, mastering, edits—the whole shebang. Scrolling through the Undo/Redo History menu moves you back in time, which makes it easy to jump back to a previous version.

GO WITH THE FLOW

Recording with the 788 is a breeze; inputs A through D are automatically routed directly to tracks 1 through 4 when the default settings are used. Aux inputs are sent to tracks 5 and 6 as well as 7 and 8. Plug in a source, enable a track, and hit Play and Record together, just like on your old cassette recorder.

You can change routings by pressing and holding one of the five Input buttons and selecting the appropriate channel. The same goes for assigning effects to a channel: press Effect 1 and select the track. Input and track levels are displayed on the Home screen.

Recording multiple takes is also easy. The 788 keeps track of what you've done, and at the end of the session, you can choose the take you want to keep. Can't make up your mind? Assign one take to the track and save the rest. With 250 virtual tracks per Song, there's plenty of room for indecision.

Like sophisticated recording consoles,

FIG. 2: The Tascam 788's rear panel provides four ¼-inch inputs, two aux inputs, and two pairs of RCA outputs along with an S/PDIF output, a headphone jack, a footswitch connection, and a SCSI-2 port.

nord electro

clavia.com

distributed by:
armadillo enterprises
727.519.9669

the rebirth of cool

virtual electromechanical

modeling technology for B3 sound sample based technology for electric & acoustic pianos

48 user presets 61 & 73 semi weighted, waterfall keys extensive effects section

second manual accessible via midi 17/20 lbs. (61/73 key) sounds updatable via USB port

the 788 features a dedicated Cue Mix bus for monitoring. The hardware faders continue to act on the source—your guitar, for instance—while a separate software mixer controls pan and level for the recorded tracks. Pressing the Cue button in the upper-right corner buses that mix to the headphones and monitor outputs. When it's time to mix, send individual channels to the Track bus and use the faders as you normally would.

I wish I could be as enthusiastic about the 788's Solo function as I am about the Cue Mix bus. That vital feature is poorly implemented. Soloing requires you to press and hold the Solo button and then press the Select button for the desired tracks. Unfortunately, a second press on the Solo button doesn't return you to normal monitoring; you must deselect each track individually, which can make jumping in and out of Solo mode with several tracks rather cumbersome.

GREAT LOCATIONS

The 788's tape-style transport rewinds and fast-forwards at speeds from 10 to 1,000 times normal. Pressing Stop and Play together returns you to zero. Pressing Stop and Fast Forward jumps to the place where recording last started, which is handy for multiple takes.

You can also enter location times directly into the counter as absolute time, MIDI Time Code (MTC), or measures and beats relative to a user-defined tempo map. For a precise location, press Stop and Play to view a waveform display of the selected track at a variety of resolutions. Spinning the Jog/Data wheel moves the cursor forward or back, and pressing Fast Forward or Rewind scrubs the audio.

Each Song holds as many as 999 nameable location points that appear in a list. A useful Trim feature allows precise setting of individual marks. A list of editable user words is included for quick labeling of location marks and tracks.

Three special location points labeled In, Out, and To serve a number of functions. For recording, they set punch-in and punch-out points. Later the In and Out points set the range over which an edit is made; the To point indicates where to paste or insert data. You can also use those points for quick and easy navigation. All in all, the 788's implementation of location points and navigation options is truly impressive.

EFFECTS AND DYNAMICS

The 788 offers some interesting options for incorporating its built-in effects. Depending on how they are routed, each of the two digital effects assumes an entirely different personality. For example, if you insert Effect 1 into a channel, it serves as a monaural multi-effects box. If you route it to the stereo send, however, it becomes a stereo processor. Effect 2 can be routed to all eight tracks, where it serves as eight separate dynamics processors, or you can add it to the stereo bus, in which case it becomes a stereo dynamics processor.

At first that seemed confusing, but the basic concept makes sense. Rather than tying up the digital signal processing power for a single stereo reverb that you might need only at mixdown, the 788 lets the effects serve different purposes at various stages of the recording process.

For example, when tracking, use Effect 1 for distortion, chorus, and delay on your guitar while compressing the vocals, bass, and percussion with Effect 2. Later, Effect 1 can provide stereo reverb for lead and background vocals while you tame the dynamics on the entire mix with Effect 2. The more I used the effects, the more I liked the flexibility.

In its Monaural mode, Effect 1 can chain as many as five effects, including distortion, pitch effects (such as flange and pitch shift), a single band of parametric EQ, chorus, delay, and reverb. You can't create any combination of effects, though (you must choose from a predetermined list), and unfortunately, you can't change the order of the effects. Compression and a noise gate are always included in a multi-effects patch, but you can switch them off. You can also save your settings to an effects library.

Many multi-effects are aimed at guitarists. The guitar input automatically engages an amp simulator—a fact not mentioned in the manual. The built-in amp simulator may not induce you to sell your old tube amp, but it's a nice feature to have.

788 Digital Portastudio Specifications

Physical Tracks	8
Virtual Tracks	250
Simultaneous Record Tracks	6
Sampling Rate	44.1 kHz
Sampling Resolution	16-bit, 24-bit
Analog Inputs	(4) balanced ¼"
Analog Outputs	(2) RCA master; (2) RCA monitor; (1) ¼" stereo headphone
Digital Output	(1) S/PDIF coaxial
Aux Sends	(2) unbalanced ¼"
Aux Returns	(2) unbalanced ¼"
Additional Connections	SCSI-2 mini-50; MIDI In, Out; (1) ¼" footswitch
Frequency Response	20 Hz–20 kHz (±1 dB)
Dynamic Range	>82 dB
Total Harmonic Distortion	<0.01% (1 kHz tone)
Effects Processors	2
Display	128 × 64-pixel backlit LCD with waveform display
Dimensions	16.3" (W) × 3.7" (H) × 11.3" (D)
Weight	main unit: 6.9 lb.; power supply: 3.4 lb.

What separates the best from the rest?

GLYPH FireWire

This is the only sign of excellence for the ultimate in FireWire storage solutions for digital audio & video.

Want to get the most from your Digi 001 or other DAW? Want to record, edit and mix 24 tracks at 24 bit & 48kHz? You want your DAW to perform and sound great, that's why the X- Project digital storage system is for you.

X Project

M Project is the new FireWire hard drive storage solution for your MOTU hard disk recording system from Glyph. M Project adds up to 75 GB of audio storage to your MOTU rig in seconds. M Project is the only MOTU-approved FireWire storage solution for the 828 FireWire interface and all MOTU PCI-324-based systems, including the 2408mkII, 1296, 1224 or 24i. M Project easily shares the FireWire bus with the 828. This is the ideal alternative to SCSI because it frees up a PCI slot.

M Project FireWire Storage

WILDFIRE

The Wildfire is a plug and play solution for all types of studios. Backup, dupe a CD, check out the mix of your song, or demo your multi-media presentation. A Wildfire CD-RW is the answer for your FireWire system.

When your non-linear editing workstation hungers for mass storage and blazing speed, Glyph's DV Project FireWire RAID array is the only solution. DV Project is specifically designed for videographers who need massive disk space without sacrificing performance. Glyph's DV Project is optimized to achieve maximum throughput on any FireWire ready system.

DV Project

GLYPH

Complete your FireWire Project Studio! When you buy Glyph FireWire you get the assurance of owning the finest FireWire connectivity available. Glyph FireWire is fast, reliable & a snap to get up & running.

735 W. Clinton Street, Ithaca, NY 14850
607-275-0345 • 607-275-9464 fax
www.glyphtech.com
All trademarks are property of their respective owners.

Effect 1 and Effect 2 are at their best when used as stereo processors. Their pedigrees show: they share much of their architecture with the processors in Tascam's digital mixers. The two effects units offer suitably rich reverbs, delays of as much as a second, chorus, flange, pitch shifter, and phaser. All in all, I give the internal effects a B for sound quality and an A for convenience and flexibility.

The 788 boasts three bands of parametric EQ per channel: high and low shelf with adjustable boost/cut and frequency, along with a peaking midrange with adjustable boost/cut, frequency, and Q. Some multi-effects chains feature a single band of EQ as well. The EQ page has niceties such as individual on/off switches and a –42/+6 dB digital pad per channel.

A Fader/Pan menu displays levels for the physical and internal faders and channel pan controls. Internal faders represent levels from the current mixer scene or MIDI automation; they interact with the physical faders based on user-defined settings deep in the Option menu.

MIDI MANEUVERS

Just about everything in the 788, from fader levels to EQ settings and effects parameters, responds to MIDI continuous controller data. To test the automation, I synced the 788 to my Mac running Mark of the Unicorn's *Digital Performer* 2.7 with a modest audio and MIDI load. I ran the 788 as an MTC slave and as a master. For the most part, it synced flawlessly, but when the 788 failed to lock, a blast of distorted audio came through my monitors. Tech support swore it had never heard of that; if the 788 can't lock, it's supposed to mute the audio.

Nevertheless, I am truly impressed with the unit's MIDI implementation. Getting into the bedroom-studio thing, I created complex automated mixes using nothing more than my keyboard's data sliders and sequencer—very cool.

The 788 records MIDI Clock and Song Position Pointer data from an external sequencer to an internal sync track. You can create complicated tempo maps on your sequencer and then use the 788 as the synchronization master. In addition, the 788 supports MIDI Machine Control as master and slave, so you can use it as a remote control for your sequencer or vice versa.

MIX MASTER

Assigning inputs A through D and the aux inputs to an internal submixer lets you mix sequenced tracks, loops, external effects, and so forth to the internal tracks. That makes a total of 14 inputs (eight prerecorded tracks and six live inputs), along with the two internal sends, which is pretty impressive for a unit in this price range.

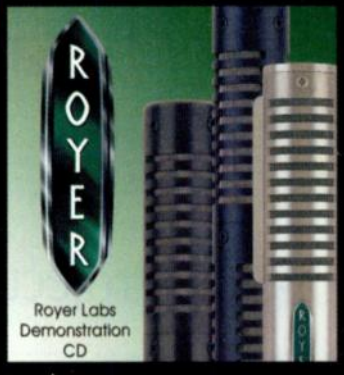
You can mix two ways: internally or in real time with the analog and digital stereo outputs. Tascam calls the first option *premastering*. As a final step before burning a CD-R or CD-RW, you can trim excess time from premastered songs, assemble them in any order, and set the length of the pause between selections. The 788 supports Track-at-Once and Disc-at-Once recording.

In the interest of science, I recorded a stereo acoustic-guitar track at 16- and 24-bit resolution. I opted for a pair of Shure SM57s—midgrade dynamic mics that are familiar to many home recordists. The higher resolution didn't yield

788 ONLINE

Tascam maintains an active Bulletin Board System (BBS; www.tascambbs.com), where users can swap tips, ask questions, and generally make noise about the 788. It's an interesting place and mercifully free of sniping and one-upmanship. Some savvy folks hang out to provide gentle encouragement for absolute beginners, and a Tascam product specialist moderates the BBS, so technical help is available.

ROYER RIBBONS
www.royerlabs.com

Hear the Ribbon Difference.
Order Your Free Royer Demo CD


To order
email: democd@royerlabs.com
or send your name, address & $3.50 for S&H to:
Royer Labs Demo CD
821 N. Ford St.
Burbank, CA 91505
(818) 760-8472
Burbank, Ca.

WHAT REALLY MATTERS IS THE SOUND

Sonically, the 830 excels with its 24-bit AD/DA converters. The 24-bit Delta-Sigma D/A converter has a beautiful, warm, balanced sound, clear in the highs with excellent stereo separation.

The CDR830 BurnIT is ideally suited for use in the recording studio or broadcast environment. The sound quality is superb, and the unit has the usual HHB reliability.

Candace Horgan
Mix, April 2001

...one of the main reasons to get a stand-alone CD burner is sound quality, and here is where BurnIT really excels. I have found all of HHB's CD recorders to have excellent audio quality ... I just know what my ears tell me – that the BurnIT sounds great.

David Darlington
HomeRecording, June 2001

HHB Communications USA Inc · 1410 Centinela Avenue, Los Angeles, CA 90025-2501, USA
Tel: 310 319 1111 · Fax: 310 319 1311 · E-Mail: sales@hhbusa.com

HHB Communications Canada Ltd · 260 King Street East, Toronto, Ontario M5A 4L5, Canada
Tel: 416 867 9000 · Fax: 416 867 1080 · E-Mail: sales@hhbcanada.com

HHB Communications Ltd · 73-75 Scrubs Lane, London NW10 6QU
Tel: 020 8962 5000 · Fax: 020 8962 5050 · E-Mail: sales@hhb.co.uk

www.hhbusa.com

HHB

FIRST WE LISTEN

SUBSCRIBE
TO
Electronic Musician
TODAY
@
www.emusician.com
800-245-2737
P.O. Box 1929, Marion, OH 43306-8039

COMPACT DISC • CASSETTE
& RECORD MANUFACTURING

CALL TOLL FREE
1.800.859.8401
For Your Free Catalog
qca
Serving the Music Industry for Over 45 Years.
2832 Spring Grove Ave., Cincinnati OH 45225
Tel: 513.681.8400 • Fax: 513.681.3777
E-mail: qca@pol.com • web: www.pol.com/QCA

PRODUCT SUMMARY

Tascam
788 Digital Portastudio
portable digital studio
$1,149

FEATURES	4.5
AUDIO QUALITY	3.5
EASE OF USE	4.5
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: Easy to use. Simultaneous recording on 6 tracks. Flexible I/O options and effects implementation. Nondestructive editing with multiple undo. Extensive MIDI control.

CONS: No current support for third party CD-R and CD-RW burners. No digital input. Mediocre headphone amp. Unstable construction.

Manufacturer
Tascam
tel. (323) 726-0303
e-mail tascamweb@tascam.com
Web www.tascam.com

a dramatic improvement. There were subtle differences, but I'm not sure I would notice them in a different monitoring environment.

In a second test, I used condenser mics. I chose a pair of AKG C 1000 S mics, which are well within reach of most readers. Although they can operate on 9V batteries, I used the phantom power and preamplifiers in my Mackie 1604-VLZ. That modest combination revealed far greater differences between the 16- and 24-bit recordings. In short, the 788 is eminently capable of capturing the detail I expect from 24-bit recording.

I also brought the 788 to a live drum session. I sent the direct signal to an ADAT recorder and the live stereo mix from a Mackie 8-Bus to the 788. My verdict? Although the kick lacked some punch and the cymbals didn't provide quite as much definition as I would have liked, the results were far better than I expected from such a modestly priced machine. With careful mic placement and an outboard mixer, you could certainly record a live band with the 788, and it's a lot more portable than the typical remote rig.

EASY DOES IT

The 788 is superbly easy to use. The setup for three common recording tasks—tracking, bouncing multiple tracks to stereo, and mixdown—is as simple as pressing a button. The 788's input options, flexible effects routing, and slick user interface allow you to spend time creating instead of slogging through menus. The manual and tutorial are pretty good too. (Tascam also maintains an informative bulletin board for the 788; see the sidebar, "788 Online.") The 788 reminded me of how much fun I used to have with my cassette ministudio.

I especially like the 788's two varispeed options. One mode slows down a pair of tracks without altering the pitch, which makes a handy tool for transcribing or learning difficult passages. The other mode alters the recorder's speed to allow for differences in tuning. I didn't expect to see those useful features in a machine aimed at the home recordist.

I can't say I'm thrilled with every aspect of the 788. The Solo feature leaves a lot to be desired, as does the quality of the headphone amp. I'd also prefer actual XLR microphone inputs rather than the adapters that Tascam provides. Also, the review unit failed after one week's use, developing a fatal short in the monitor bus. Although Tascam was quick to send a replacement, it does raise durability issues.

Still, taking everything into consideration, the Tascam 788 Digital Portastudio is a winner. If you are new to home recording or are thinking of upgrading to a digital recorder, check it out. Experienced users won't be disappointed, either. With its extensive MIDI implementation, 24-bit resolution, and portability, the 788 is ideal wherever inspiration strikes you.

Mark Nelson's *first studio ran on batteries. If he had any sense, his current one would too. Thanks to Paul Ezekial and Studio D for their help.*

RME
INTELLIGENT AUDIO SOLUTIONS
HAMMERFALL DSP SYSTEM

24 Bit / 96 kHz Mobile Multitrack System

- 100% Plug and Play Compatible
- 32-96 kHz Sample Frequency
- 16/20/24/32 Bit Support

- DIGICheck ® in Hardware
- Zero Latency Monitoring
- AutoSync Clock Control
- TotalMix ™ Technology
- SyncCheck®

- Available I/O is dependent on various Interfaces
- SPDIF Optical
- SPDIF RCA
- AES/EBU Compatible
- ADAT Optical
- ADAT Sync
- Word Clock
- MIDI
- Analog

RME's world famous Hammerfall ® technology has evolved into the Hammerfall ® DSP System, the most flexible audio system ever. It doesn't matter if notebook or desktop, if Mac or PC, with the Hammerfall DSP System you'll easily add 24 Bit/96 kHz, S/PDIF and ADAT Optical, ADAT Sync, Analog I/O, MIDI I/O and Word Clock I/O.

TotalMix ™, RME's latest hardware solution for digital real-time mixing and monitoring, can be used to set up several independent submixes of all inputs and outputs.

DIGICheck ®, RME's ground breaking digital audio analysis software, is implemented into the hardware. Get professional level metering with peak- and RMS values in broadcast quality. Monitor up to 80 channels with nearly zero CPU load.

With latencies down to 1.5 ms, the Hammerfall DSP System drives virtual synths with ease and makes your hard-disk recording software fly...

Take off now!

CardBus

PCI Card

Multiface

Digiface

www.rme-audio.com

THE REVOLUTION IN MOBILE RECORDING

Control & Monitor Your Favorite Audio/Sequencers, Digital Mixers, Outboard Effects, Samplers, Synths, Drum Machines, Tone Generators, Hard Disk Recorders, POD...

All from a single, hand-held, portable device...

NOW SHIPPING ON EARTH

C-MEXX SOFTWARE

www.c-mexx.com

MIR
midi interactive remote

www.mircontrol.com

PERFECT STEREO FROM JUST ONE BOX

2 Channel 2 Way Near-Field Monitor

EMES is the first speaker manufacturer who designs studio monitor systems for the professional that are capable of reproducing any stereo image while avoiding the weak performance of standard mono speaker configurations!

This highly revolutionary concept is a new approach to the acoustical crosstalk problem (the fact that the left ear hears the right speaker and vice versa).

All driver components are measured twice and matched with a max. tolerance of ± 0.2 dB!

An OWL-System easily substitutes a complete front channel configuration (L/C/R) in surround sound set up.

EMES
STUDIO MONITORING SYSTEMS

the OWL system

www.emes.de

To find a dealer in your area contact:

X-VISION AUDIOUS LTD. 241 FEDERAL PLAZA WEST
SUITE 406 YOUNGSTOWN, OHIO 44503
VOICE: (330) 747-3862 FAX: (330) 747-3865

www.xvisionaudio.com

XVISION AUDIO

ROLAND

XV-5080

Roland aims for the ultimate sample-playback box.

By Rob Shrock

When I first saw the XV-5080, I knew it was destined to be a big success. When it finally hit the street a few months later, the XV-5080 was in such demand that getting a loaner for this review took a few more months. When I finally received the review unit, Roland made my wait worthwhile by providing all four new SRX expansion boards.

Roland designed the XV-5080 to be the ultimate sample-playback module, and the results are outstanding. A direct descendent of the JV series of sample-playback synth modules and a close cousin of the S-700 sampler series, Roland's new rackmount synthesizer is much more powerful than its predecessors, thanks to a slew of new features.

A SOUND FOUNDATION

You can easily access most functions from the XV-5080's front panel, which bears some resemblance to that of the JV-1080 and JV-2080 (see **Fig. 1**). Six soft function buttons appear beneath the backlit display, which packs a lot of information into a few square inches. Other buttons let you select sounds, change modes, and maneuver through features. About half of the buttons light up to indicate their status. The XV-5080's only knob (besides Volume) is the Value Dial, which provides a means to change parameter values.

You can configure the eight analog outputs as four pairs or eight individual outs (see **Fig. 2**). By default, the entire mix is routed to the first pair; the optical and coaxial S/PDIF digital outputs simultaneously mirror that mix. An R-Bus connector passes as many as eight channels of audio to another R-Bus–compatible device such as a Roland VM-series mixer. The XV-5080 also supplies Word-Clock in for stable synchronization with other digital devices.

The XV-5080's analog outputs sound better than those of the JV-series modules. The basses have a solid low end that was missing from the JV-1080. To optimize levels, the XV-5080 lets you boost or cut its overall output by 12 dB in 6 dB increments. Although higher output levels are better for single Patches, lowering the output prevents clipping when you play a large number of Patches simultaneously in a dense Performance.

The XV-5080 is 32-part multitimbral and 128-note polyphonic. (If you need more notes, you can stack multiple units.) It retains the basic structural hierarchy that Roland has supported for years: Samples, Tones (Partials), Patches, Performances, and Volumes. However, the new XV-series synths support stereo Tones (the JV series used only mono Tones), which are featured in many new presets. The XV-5080 can load JV-series and S-700 Patches and Performances, but oddly, it can't load JV Performances.

A stock XV-5080 has nine factory-preset banks, including two banks of General MIDI 2 sounds and one User bank, providing a total of 1,280 Patches, 128 Performances, and 27 Rhythm Sets. All of the JV-2080's waveforms and Patches are included as well as waveforms from one of my favorite Rolands, the JD-990. Three banks contain all new Patches; if you're looking for inspiration, you're going to love the new sounds.

An optional SmartMedia card stores an additional eight complete User banks—each with 128 Patches, 64 Performances, and 4 Rhythm Sets—raising the total to 2,304 Patches, 640 Performances, and 59 Rhythm Sets. All are available as soon as you power up the machine.

You can install as many as four JV-series expansion cards and another four SRX-series expansion cards in an XV-5080, providing even more waveform data (see the sidebar, "Expansion Options"). If that's still not enough, you can load a total of 128 MB of additional samples into the XV-5080 via SCSI. The XV-5080 does not ship with any RAM, but as cheap as memory is, there's no reason not to expand it to its maximum capability through its two 72-pin SIMM slots. The ability to import samples makes it possible to fully customize the XV-5080's sound library.

Roland has obviously continued to refine its products' effects processing. The XV-5080 contains four independent effects processors: multi-effects, chorus, reverb, and EQ. Effects routing is much more flexible than in the JV-series synths, allowing for quite elaborate effects processing, even at the Performance level.

FIG. 1: A logical successor to the Roland JV-1080 and JV-2080, the XV-5080 is 128-note polyphonic and 32-part multitimbral. You can expand its internal RAM to 128 MB to store samples imported from a variety of sources. A front-panel port accepts SmartMedia cards for external data storage.

A DIFFERENT BEAST

Although the XV-5080's basic architecture is similar to that of the JV-series synths, the XV-5080 is a more mature manifestation of those multitimbral modules. To save space, I'll assume you're familiar with the older JV-series modules and concentrate on the XV-5080's new features.

As I mentioned, one of the XV-5080's fundamental developments is its use of stereo Tones. XV-5080 Patches are

The world's best selling USB MIDI interface now comes with a few added features...

Keys.

Introducing the USB Keystation Series from MIDIMAN.

midiman

M POWERED.

800-969-6434 • WWW.MIDIMAN.COM • EMAIL: INFO@MIDIMAN.COM

FIG. 2: The XV-5080 features word clock in and three digital outputs: coaxial S/PDIF, optical S/PDIF, and Roland R-Bus. You can configure the balanced outputs as four pairs or eight individual outs. Two MIDI Ins allow 32-channel operation, and a SCSI port connects to peripherals such as a CD-ROM or Zip drive.

composed of four Tones (built from internal waveforms) or Multi-Partials (when samples are loaded from disk). The earlier JV-series models took two Tones to create a true stereo sound, so most JV Patches were constructed by stacking mono Tones. Conversely, the XV-5080's raw samples can be stereo and still use only one Tone (though each stereo Tone consumes two notes of polyphony).

Rather than simply repackaging the same basic sound set, as Roland has done for several years, the company created a solid collection of new stereo waveforms for the XV series. In addition to the XV-5080's stock waveform ROM, the new SRX boards incorporate new waveforms, mostly in stereo. The updated sound development has given a welcome face-lift to the Roland sound.

The variety of sounds is especially impressive, encompassing almost any music style you can imagine. The basses rumble, the pads are sweet, and the synths have bite. Excellent use of Velocity cross-switching brings many new sounds to life. A lot of Patches have too much effects processing for my taste, but a little tweaking really makes the factory presets shine. It's not difficult to find hundreds of useful timbres of consistently high quality. A fully loaded XV-5080 covers the bases almost anyone requires in a synth module.

The XV-5080 organizes its internal Patches into 37 categories (KEY, ORG, STR, SYN, and so on). A big orange button on the front panel lets you access the popular Patch Finder feature introduced in the JV-2080. To find the right acoustic-guitar sound, simply push the Patch Finder button, move the cursor down to the AGT category, and spin the Value Dial. Only Patches assigned to the AGT setting are listed, regardless of whether they're internal presets, expansion-card sounds, or samples loaded into RAM. When you press the Volume button, a short sequence specific to the category plays to audition the sound. That Phrase Preview feature, along with the Patch Finder, can really increase your productivity when searching for sounds.

CARE FOR A SAMPLE?

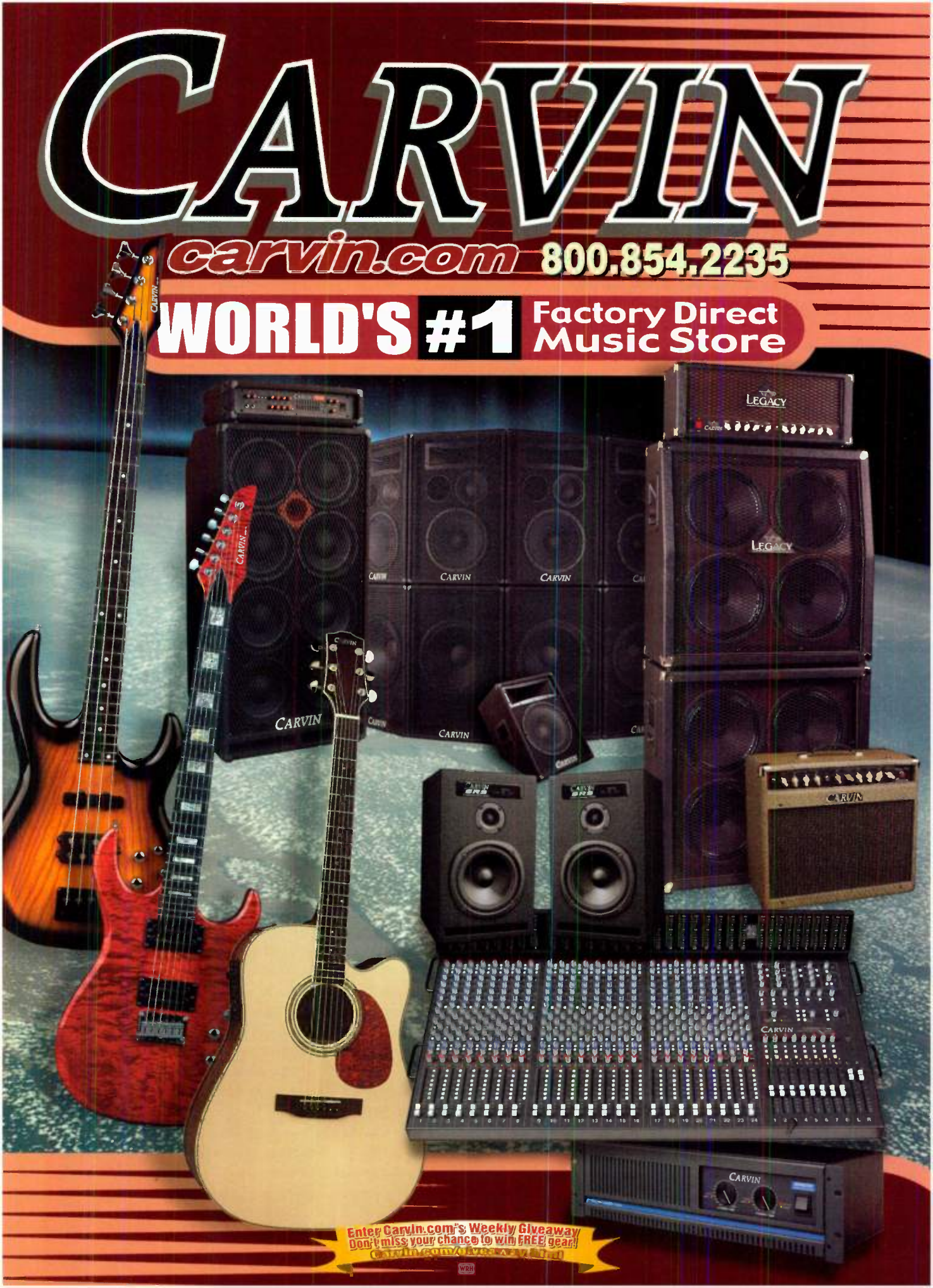
As I wrote this review, many people asked, "Will the XV-5080 replace my S-760 sampler?" The answer is yes—and no. Maybe. It depends on what you need, but consider a few important points before you sell your wall of S-760s.

The XV-5080 is not a sampler; you can't record sounds into it and create Patches from scratch as you can with a legitimate sampler. However, the XV-5080 can load existing sample libraries. Roland didn't design it as a replacement for the S-760 but as a logical successor to the JV-series, with sample-loading and -playback capabilities thrown in as a bonus.

The XV-5080 imports any Roland S-700 format sample data as well as Akai S1000 and 3000, AIFF, and WAV libraries. Unfortunately, I had some problems Roland couldn't account for. Although S-700 Patches loaded properly, a few Performances did not. When certain Performances contained numerous Patches with Velocity crossfades, the XV-5080 assigned the Patches to different MIDI channels rather than a single MIDI channel as intended. The Harp Performance from the *Synclavier Strings* disk, for example, loaded Harp 1A and 1B on different MIDI channels. With those Performances, I also had

XV-5080 Specifications

Sound Engine	sample playback
Maximum Polyphony	128-note
Multitimbrality	32-part
Waveform ROM	64 MB, 16-bit linear
ROM/RAM Patches	1,152/128
ROM/RAM Performances	64/64
ROM/RAM Rhythm Sets	23/4
ROM Expansion	(4) SRX slots; (4) SR-JV80 slots
RAM Expansion	(2) 72-pin SIMM slots; max. 128 MB
Removable Storage	SmartMedia
Sequencer	none
Effects	(90) multi-effects (max. 3 simultaneous); (4) reverbs; (2) choruses; 2-band EQ × (8) outputs
Analog Audio Outputs	(8) unbalanced ¼" TS; (1) ¼" TRS stereo headphone
Digital Audio Outputs	(1) S/PDIF optical; (1) S/PDIF coaxial; (1) R-Bus
MIDI Ports	(2) In; (1) Out; (1) Thru
Other Ports	(1) DB 25-pin SCSI; (1) Word-Clock in (BNC)
Display	320 × 80-pixel backlit LCD
Dimensions	2U × 11.06" (D)
Weight	10.81 lb.


CARVIN
carvin.com
800.854.2235
WORLD'S #1 Factory Direct Music Store
LEGACY
CARVIN
Enter Carvin.com's Weekly Giveaway
Don't miss your chance to win FREE gear!

trouble importing Velocity crossfade information.

For the most part, the XV-5080 does an excellent job of translating the keymap and envelope parameters from foreign file formats, though stereo Akai S1000 files occasionally loaded in mono with only one side of the stereo samples.

Once samples are loaded, you can treat them like any other waveform in the XV-5080. Only a few S-760 sample-editing parameters are available: original key, start point, loop points, loop mode, and loop tuning. You can't normalize, truncate, reverse, cut, copy, or paste, but you can process Samples and Patches with the powerful internal effects. You can even combine your sample-based Patches into elaborate Performances with any internal Patch, making the XV-5080 an extremely powerful all-in-one box.

Sounds that you import into the XV-5080 are always loaded into the User bank. The User bank is different from that of the JV-series synths, in which your customized sound palettes are always available. Like other synthesizers, the XV-5080 holds Patches and Performances in memory when you turn the power off, but like a sampler, it loses any samples you loaded if you don't save the contents first. When you load new sounds, the XV-5080 prompts you to overwrite or append to the User bank's existing contents.

▼

If you're looking for inspiration, you're going to love these new sounds.

After loading the desired samples and Patches and creating any new Performances, save the contents to a SCSI device or a SmartMedia card if you don't want to lose them. The XV-5080 operating system (version 1.23 at this writing) lets you save only the entire User bank; you can't store individual items such as specific Patches or Performances. After you execute a Full Load, a QuickSave feature lets you write only the changes you made to the User bank since the previous load.

You can store a maximum of eight User banks on a SmartMedia card. You can also "register" any bank to contain sample data up to the XV-5080's 128 MB limit or the card's capacity, whichever comes first. My 64 MB SmartMedia cards each hold about 62 MB of sample data, in addition to eight banks of 128 Patches, 64 Performances, and 4 Rhythm Sets. The XV-5080 can read the parameter data (but not the samples) directly from the card without loading it into memory first.

DATA DILEMMAS

The XV-5080's file structure is completely different from the S-760's. Whereas the S-760 required you to use Roland's proprietary file format, the XV-5080 lets you store sample data in either AIFF or WAV format. Although the XV-5080 loads data from the older S-700 format, it actually converts it to

EXPANSION OPTIONS

If a stock XV-5080's 1,083 internal waveforms are not enough, you can add as many as four JV-series and four SRX-series expansion boards. Roland has four SRX- and 18 JV-series boards available. During the course of this review, I worked with all four SRX expansion boards.

The SRX-01 Dynamic Drum Kits board ($395) offers 719 waveforms, many of them stereo. With no electronic percussion sounds, the board's emphasis is on real drums. A total of 79 Rhythm Sets provide kits and single instruments, from rocking kicks and snares to a collection of detailed brush kits. Although sound quality is mostly good, the crash cymbals don't have much transient attack.

The SRX-02 Concert Piano board ($395) devotes its entire 64 MB of wave data to acoustic piano. I don't think any sampled piano sounds perfect, but the DynamicGrand and Bright Grand Patches are stereo piano sounds that I turn to for everyday work. Most Patches respond well to touch and record nicely too. Only 50 Patches are provided—no Performances or Rhythm Sets are included—but the handful of pianos sound great.

The SRX-03 Studio SRX board ($395) offers 128 Patches and 12 Rhythm Sets to augment your meat-and-potato studio needs. The collection of pianos, guitars, basses, brass, saxes, woodwinds, pads, vocal, lead synths, and effects isn't exhaustive, but it effectively supplements the similar sounds in a stock XV-5080. The board is not glamorous, but you will probably use it a lot.

The SRX-04 Symphonic Strings board ($395) is a collection of gorgeous violin, viola, cello, and bass samples. Ensembles and small sections provide various articulations—such as marcato, legato, spiccato, pizzicato, and tremolo—but muted sections are missing. A good number of Patches contain four stereo Tones consuming eight voices per note, quickly chewing through polyphony. However, you might need hundreds of megabytes of RAM and an expensive sample library to rival what this single expansion board provides.

In addition to offering the SRX boards, Roland has reissued the L-CDX series of sample CD-ROMs in packages that are more affordable. The sample libraries are still distributed in S-700 format, which means that they are available to new XV-5080 users as well as to legacy Roland sampler users.

INTRODUCING THE ANTARES VOCAL PRODUCER

Need a great vocal sound? Work with a great producer.

Introducing the Antares Vocal Producer.™
Killer vocal sounds.
Auto-Tune™ pitch correction.
$495.00
(ESTIMATED STREET PRICE)

AVP FEATURES

- >> Auto-Tune Real-time Pitch Correction
- >> Antares Microphone Modeling
- >> Analog Tube Modeling
- >> Variable Knee Compressor
- >> Downward Expanding Gate
- >> Variable Frequency De-Esser
- >> Flexible Parametric EQ
- >> Automatic Mono or Stereo Double Tracking
- >> Fully Programmable
- >> MIDI Automation
- >> Factory Presets for a Wide Variety of Vocal Styles
- >> Really Easy To Use

THE HEART OF ANY GREAT SONG is a great vocal sound. With Antares's new Vocal Producer, we've combined our world-renowned Auto-Tune Pitch Correction and TEC-Award-winning Microphone Modeler technologies with state-of-the-art vocal processing modules to give you everything you need to create stunning vocal tracks in any musical style.

FREEDOM OF CHOICE

Live or in the studio, the AVP lets you instantly select from a large library of sounds. From gorgeously mellow to seriously twisted, we've included factory presets for a wide variety of vocal styles as well as an interface that makes it easy to create your own signature sounds. (And given the power and flexibility of the AVP's processing modules, we've even included a selection of presets for instrumental and percussion tracks.)

NOW HEAR THIS

Check out the Vocal Producer at your local Antares dealer or surf on over to our web site for some illuminating audio examples. With an estimated street price of $495, this is one great producer you can afford to work with.

WHILE THE AVP WORKS GREAT WITH ANY MIC, THESE MICS PROVIDE IDEAL INPUT FOR ANTARES MICROPHONE MODELING:

audio-technica®	AT4033 AT3035 ATM41a
CAD®	M177 E200 E350
RØDE®	NT1 NT2 NT3
SHURE®	SM57 Beta 58A® KSM32

ANTARES

WHERE THE FUTURE'S STILL WHAT IT USED TO BE

ANTARES AUDIO TECHNOLOGIES 231 Technology Circle, Scotts Valley, CA 95066 USA
voice: 831 461 7800 | info@antarestech.com | www.antarestech.com

02

LOGOS AND TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS, AND DO NOT IN ANY WAY IMPLY ANY ASSOCIATION WITH OR ENDORSEMENT BY ANY OF THE NAMED MANUFACTURERS.

the new format, just as it converts Akai data. Consequently, an S-760 can't read any data stored by the XV-5080, but your computer recognizes it as WAV or AIFF data.

Although you can view Performances and Patches on SmartMedia or SCSI devices, you can't see Partials. Likewise, sample names are stripped away and replaced with names such as sound0032. When you load the data back into the XV-5080, though, the proper Sample and Partial names reappear. Roland says that most users "don't want to be bothered" with such details, but I found that inconvenient when trying to find the perfect snare-drum sample. Fortunately, the problem affects only data written to a storage disk—when you preview existing sample libraries, their full sample and Partial names are displayed.

I was also dismayed to find that if too many objects are in a User bank, the XV-5080 takes much too long to save them. For instance, it took from two to three minutes to save a 50 MB User bank containing 110 samples to a Zip disk. If that 50 MB User bank contains 900 smaller samples (such as drum sounds), it might take almost half an hour to save the data via SCSI. For one project, a 90 MB User bank took almost an hour for a full save. The type of SCSI device you use makes a difference, but even saving to SmartMedia cards is slower than I prefer.

I don't understand why it took as long to reload samples in native XV format, either WAV or AIFF, as it originally took to import them. Slow load times might be understandable during the initial conversion, but the native WAV or AIFF load times should be much faster.

Further disappointing is the fact that you can't play the current Performance while the XV-5080 saves in the background (as you can with some samplers); the disk-write process completely takes over. If your XV-5080 is loaded with a lot of samples, you might be forced to take a lunch break just to perform a full save.

Although saving Patches and Performances without sample data is quick, the time it takes to save sample data is annoying. I hope Roland devotes more programming effort to addressing weaknesses in the operating system and disk structure of an otherwise excellent product.

PRODUCT SUMMARY

Roland
XV-5080
synthesizer module
$2,495

FEATURES	4.0
EASE OF USE	4.0
AUDIO QUALITY	4.5
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: 128-note polyphony over 32 MIDI channels. Stereo Tones. Expandability. Loads Roland S-700, Akai, WAV, and AIFF sample data. Expandable RAM to 128 MB. SmartMedia card memory storage. Eight assignable analog outputs. Word-Clock input. Patch Finder feature. Superb effects with flexible routing. More simultaneous effects than previous Roland synths.

CONS: Can't load JV-1080 Performances (Patches only) or save individual objects. Doesn't always correctly load Performances from Roland sample CDs. Slow disk-write times under certain circumstances. No playback during disk-write operation.

Manufacturer
Roland Corporation U.S.
tel. (323) 890-3700
Web www.rolandus.com

EFFECTIVE PROCESSES

Compared with previous Roland products, the XV-5080's effects section is supercharged. Each output pair has its own 2-band EQ, and in Patch mode, each Tone or Partial has its own send control for separate chorus, reverb, and multi-effects modules.

Like the JV series, the XV-5080 has separate chorus and reverb modules with discrete send amounts per Part in Performance mode. You also can bus each Part to one of three simultaneously available multi-effects units. (In the JV-1080, only one multi-effects unit is available for the whole Performance.) Each Part has its own individual send control for each effect, and you can completely or partially bus all the effects into each other. The effects routing is much more flexible and useful than ever before.

The XV-5080 has 90 multi-effects units, each with a comprehensive set of editable parameters. (The owner's manual devotes more than 60 pages to describing the multi-effects and their parameters.) You can use MIDI to modulate many multi-effects parameters in real time.

A few dozen effects are true multi-effects algorithms, containing several simultaneous effects. Some effects use COSM-based modeling technology found in Roland's line of guitar processors. The XV-5080's effects engine is powerful and sounds great for many types of processing. Especially for live performance, the quality of the internal effects can't be beat.

PROOF IN THE PLAYBACK

Despite my criticisms, I really like the XV-5080. The XV-5080 greatly fills the void left by Roland's discontinuation of the S-760. Nonetheless, I hope that Roland will address my concerns about its operating system and file structure. Seen as a continuation of the JV-series sound modules, the XV-5080 is a huge leap forward in design and implementation.

Although you can get a lot of mileage from computer-based virtual synths and samplers, it's hard to beat the sheer collective power of the XV-5080's incredibly large assortment of internal sounds, expansion cards, sample-playback capabilities, and internal effects processing. It doesn't drain your computer's resources, and it resides in just two rackspaces. The XV-5080 is a formidable product that might well be the ultimate sound module.

Composer and arranger **Rob Shrock** *has worked with Burt Bacharach, Garth Brooks, Elvis Costello, Sheryl Crow, Gloria Estefan, Faith Hill, Whitney Houston, Chrissie Hynde, Mikaila, 'N Sync, and many others.*

Introducing the

C-Port (DSP2000)

Change the way you think!

(Works on all PCI 2.1 compliant motherboards Including Intel, AMD, VIA)

$449*

Total 12 in 12 out (10in 10 out 24Bit 96Khz) including - 2 Balanced XLR inputs with MIC preamps and Phantom power - 8 in 8 out 1/4" jack Line level
2 in 2 out Digital IO (Optical, Coaxial and AES/EBU) - Headphone output
Stereo 18Bit Converters on the card for Accelerated Direct Sound Support
32 Channel MIDI out - 16 Channel MIDI in - ASIO2, MME, GSIF, Direct Sound, with
Rock Solid 2ms Latency @ 24Bit 96Khz Drivers - Multi Card Support (up to 40 Channels I/O)
ADAT TDIF VIA DS2000 (Optional) - Logic Soundtrack 24Bit Software

See it! hear It! Believe it!

Unconditional 12 Months warranty Including a 60 day money back guarantee

Distributed by KAYSOUND
5 Coton Lane, Champlain, NY 12919
2165 46th Ave., Lachine, Quebec H8T 2P1
1-800-343-0353

www.staudio.com

www.kaysound.com

Available at

www.marsmusic.com

Musician's Friend
1-800-776-5173
www.musiciansfriend.com

MARS MUSIC
the musicmaker's destination

*Estimated Street Price.

M O T U

828 (MAC/WIN)

Computers with FireWire get a multichannel audio interface.

By Rob Shrock

Until recently, MOTU's popular line of audio interfaces—the 2408, 1224, 308, 24i, and 1296—all connected to a host computer through MOTU's PCI-324 card. The 828, MOTU's newest interface, connects directly to an IEEE 1394 FireWire port on a Mac or a Windows-compatible PC (see **Fig. 1**). The 828 makes high-speed, high-quality multitrack hard-disk recording possible for computers without PCI expansion slots.

The 828 offers eight channels of analog I/O, eight channels of ADAT Lightpipe I/O, stereo S/PDIF I/O, ADAT sync, zero-latency monitoring, and two phantom-powered mic preamps. For smaller recording systems, especially portable laptop setups, the 828 may be the perfect solution for getting 24-bit audio into and out of your computer.

STUDIO IN A RACK

The 828's rear panel includes two balanced mic/line inputs with Neutrik combo (XLR and ¼-inch) jacks; six balanced ¼-inch line inputs; eight balanced ¼-inch line output jacks, two balanced ¼-inch main output jacks, and a ¼-inch footswitch jack (see **Fig. 2**). All of the analog I/O operates at +4 dBu. A single front-panel switch turns on phantom power for the mic preamps.

The output of channels 1 and 2 is mirrored on the main outputs: a front-panel Volume knob controls their level as well as the headphone output. Front-panel input trim knobs give you independent level setting for channels 1 and 2 and level setting in pairs for line inputs 3 through 8. The 828 has 24-bit converters throughout.

In addition to the analog I/O, the 828 provides two channels of S/PDIF input and output on RCA and optical connectors. You can also configure the optical connectors for 8-channel ADAT Lightpipe I/O. An ADAT sync-in jack lets you synchronize the 828 to ADAT-compatible devices with sample accuracy. All 18 inputs and outputs—8 analog, 8 Lightpipe, and 2 S/PDIF RCA—are simultaneously active.

From a hardware perspective, the 828 is well constructed. The analog connectors are gold plated and feel solid and snug; the plugs won't slip out of their jacks as they do on some inexpensive USB audio interfaces I've seen. The front-panel trim knobs on my review unit were a little rough and inconsistent, but they smoothed out a bit with use.

Like the 2408 line of MOTU interfaces, the 828 has an internal power supply, which is great but adds a little more weight to the unit. Overall, the 828 should fare perfectly well in any studio installation, and I suspect that it will also travel well in road cases handled by commercial airlines.

IT'S A SETUP

Installing and configuring the 828's software was a snap on the Macintosh. The 828 CD-ROM contains Mac and Windows installers and loads the necessary extensions, drivers, and control panels for proper operation. To connect the 828 to the host computer, simply route the included 15-foot FireWire cable from the computer to the 828 interface.

The 828's software control panel looks much like the Configure Hardware Driver dialog box used with other MOTU audio interfaces. Use the pull-down menus to set the sampling rate, clock source, sample buffer, optical input and output type, main analog-output pair, and analog-input monitor channels. You can also program the functionality of the footswitch jack; it is usually set to toggle Record on and off, which is handy for manually punching in and out. On the Macintosh, the 828 software installs a Control Strip module that allows immediate access to the 828's control-panel settings from anywhere on your computer.

The 828's control panel also provides access to CueMix Plus, which lets you mix the signal going into any analog input with the main outputs in real time. The monitoring latency of CueMix Plus is lower than the original CueMix that came with earlier MOTU audio interfaces. A dedicated monitor-level knob balances the selected live input with the main outputs, and the main Volume knob controls the summed signal.

The 828 comes with the Mac-only *AudioDesk*, a software package that's a full-featured digital audio workstation. *AudioDesk* is essentially *Digital Performer* 2.4 without the MIDI features and includes all of the MOTU Audio System (MAS) plug-ins that ship with *Digital Performer* 2.4. You can use additional third-party MAS and VST plug-ins in *AudioDesk*, though VST plug-ins require an additional shell application such as Cycling '74 *Pluggo* or Audio Ease *VST Wrapper*. For Mac users who don't use MIDI in their projects, *AudioDesk* could very well be all the recording software they need.

In addition to providing full integration with *Digital Performer*, the 828 comes with ASIO drivers for Windows and the Mac, a Sound Manager driver

FIG. 1: An ideal solution for laptop recordists, the MOTU 828 connects to your Mac or PC with a high-speed FireWire cable. By providing two mic preamps and phantom power, the 828 eliminates the need for a mixer when you record remotely.

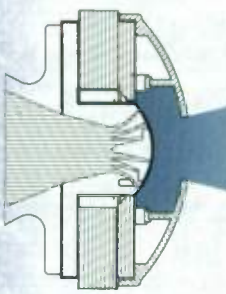
Sure we charge a heckuva lot for the S500 15-INCH 2-WAY. After you hear it, you may wonder why we SELL IT SO CHEAP.

Yeah, the S500 **looks** like a lot of other 15-inch 2-way SR loudspeakers but it sure doesn't **sound** like other 15-inch 2-way speakers. This one kicks so much butt you'd swear it was wearing army boots and is so accurate you can hear the tiny piece of roast beef stuck between the singer's teeth.

Walk into a music store and you'll encounter a whole wall of 15-inch, 2-way speakers — including our S500. Check out the price tags and your reaction may be, "Where does Mackie get off charging 20-25% more?"

Well, Greg Mackie figured the world didn't need yet another OK-sounding commodity-grade speaker. So instead of starting with a pricepoint, we started with a goal: make the best-sounding, widest-dispersion, highest-accuracy 15-inch 2-way loudspeaker yet.

Of course, owning RCF™, one of the world's most advanced transducer design and manufacturing facilities didn't hurt either.



The S500 uses a new RCF Precision™ titanium compression driver with a 3-slot optimized geometry phase plug that significantly smooths high-end frequency response and provides exceptional coupling with the 75°x65° exponential horn.

We used their latest damped titanium compression driver and a new ultra-efficient LF transducer with heat-resistant Inside/Outside voice coil. Then we combined it with a low-impedance, low-distortion crossover and tossed in some sophisticated electronic protection circuits.

The result is 500-watt RMS power handling and 127dB SPL output with smooth frequency response and superb horizontal and vertical dispersion — so all of your audience hears the same great sound.

If you want to sound as good as you possibly can — and if you're willing to pay a bit more to get unparalled accuracy, you're ready for the S500.

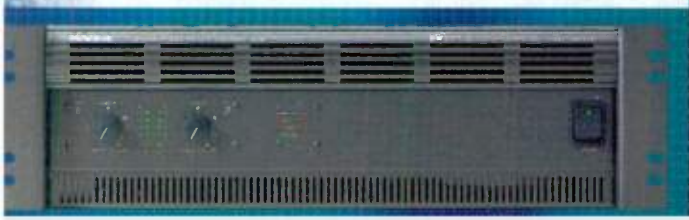
Get your ears pressure-washed at a Mackie dealer soon.

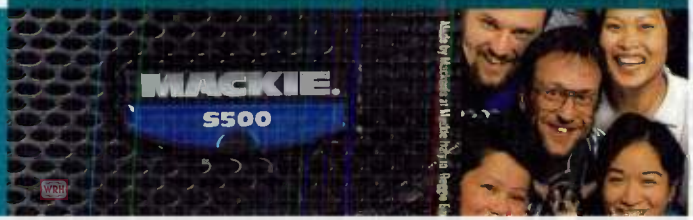
- Rugged resin end caps top and bottom
- RCF Precision™ 1.75-inch diameter titanium compression driver with 3-slot, optimized geometry phase plug
- 16-ply Baltic Birch plywood trapezoidal enclosure
- Weight-balanced side handles plus top and bottom handles
- 15-inch RCF Precision™ high-efficiency LF transducer with heat-resistant Inside/Outside voice coil
- Inside: Phase-precise, low-Z crossover with active electronic HF protection circuitry

PERFECT MATCH: THE M•2600 POWER AMPLIFIER

• 2600W 4-ohms bridged • 1300+1300W 2-ohm load • 850+850W 4-ohm load • 500+500W 8-ohm load • Fast Recovery™ circuitry • Front-to-side T-Tunnel fan cooling via mirror-polished heat sinks • Variable low-cut filters • Switchable limiter circuit • 60Hz/90Hz/120Hz electronic subwoofer crossover • 5-way and Speakon® outputs • Signal present, OL, status, temp & short circuit LED displays

MACKIE.





www.mackie.com
800.258.6883

FIG. 2: The 828 provides eight channels of analog I/O on balanced ¼-inch jacks, two of which also accept XLR inputs. By also providing stereo S/PDIF and 8-channel ADAT Lightpipe I/O, the 828 offers 18 simultaneous inputs and outputs. Sample-accurate audio transfers are possible using the ADAT sync input, and a programmable footswitch jack allows hands-free punch-ins and other functions.

for the Mac, and WDM drivers for Windows. Those drivers allow recording, editing, and mixing using virtually any audio software on either computer platform.

QUIET, I'M WORKING!

In the midst of writing this review, I faced a very busy weekend. I was scheduled to perform two Burt Bacharach concerts in Tulsa. I also needed to sequence 30 minutes of music for a Six Flags over Texas show and record it as audio files for a Monday morning vocal session. After a quick check of the 828's basic functionality at home, I left on Friday with the 828, my PowerBook G3/400 MHz, a Roland XV-5080 sound module, a CD-ROM drive, my sample library, a pair of small powered monitors, and a Roland XP-30 to use as a controller. I crossed my fingers and headed for Tulsa.

Setting up the whole rig was a cinch; the hardest part was rearranging my hotel room's furniture to accommodate the cabling. Because I had eight songs to sequence and record during the weekend, I decided to print tracks immediately after completing each song while it was still fresh in my mind. That way, I would know early on if there would be any problems recording audio files with my setup.

Because the XV-5080 has an RCA S/PDIF output, I elected to record into MOTU *Digital Performer* 2.72 using the 828's S/PDIF input. However, the 828 does not let you assign any digital inputs to the independent monitor pair, which only work with the analog inputs. That's understandable, as digital monitoring would require an additional pair of D/A converters to allow the S/PDIF input to show up at the analog mix circuitry. I simply used two ¼-inch cables and connected the XV-5080's analog outputs to the 828's analog inputs. That let me monitor the XV-5080 through the 828 as I sequenced. Another option would have been to monitor the S/PDIF input through *Digital Performer* by setting the Input Monitoring mode to "Monitor record-enabled tracks through effects."

Before recording the XV-5080 outputs, I changed *Digital Performer*'s clock source from internal to S/PDIF input. That made the 828 synchronize perfectly to the XV-5080's digital output, resulting in clean, glitch-free audio.

During the next three days, I successfully sequenced the MIDI tracks and recorded them as audio files without even a hiccup from the 828. I finished with enough time left over to tweak the *Digital Performer* tracks to a finer level by time-shifting parts, adding compression and EQ, and so on before the vocal and mix sessions. I was astounded at what I was able to do with such a small amount of gear while I sat in a hotel room during a weekend.

ROUND TWO

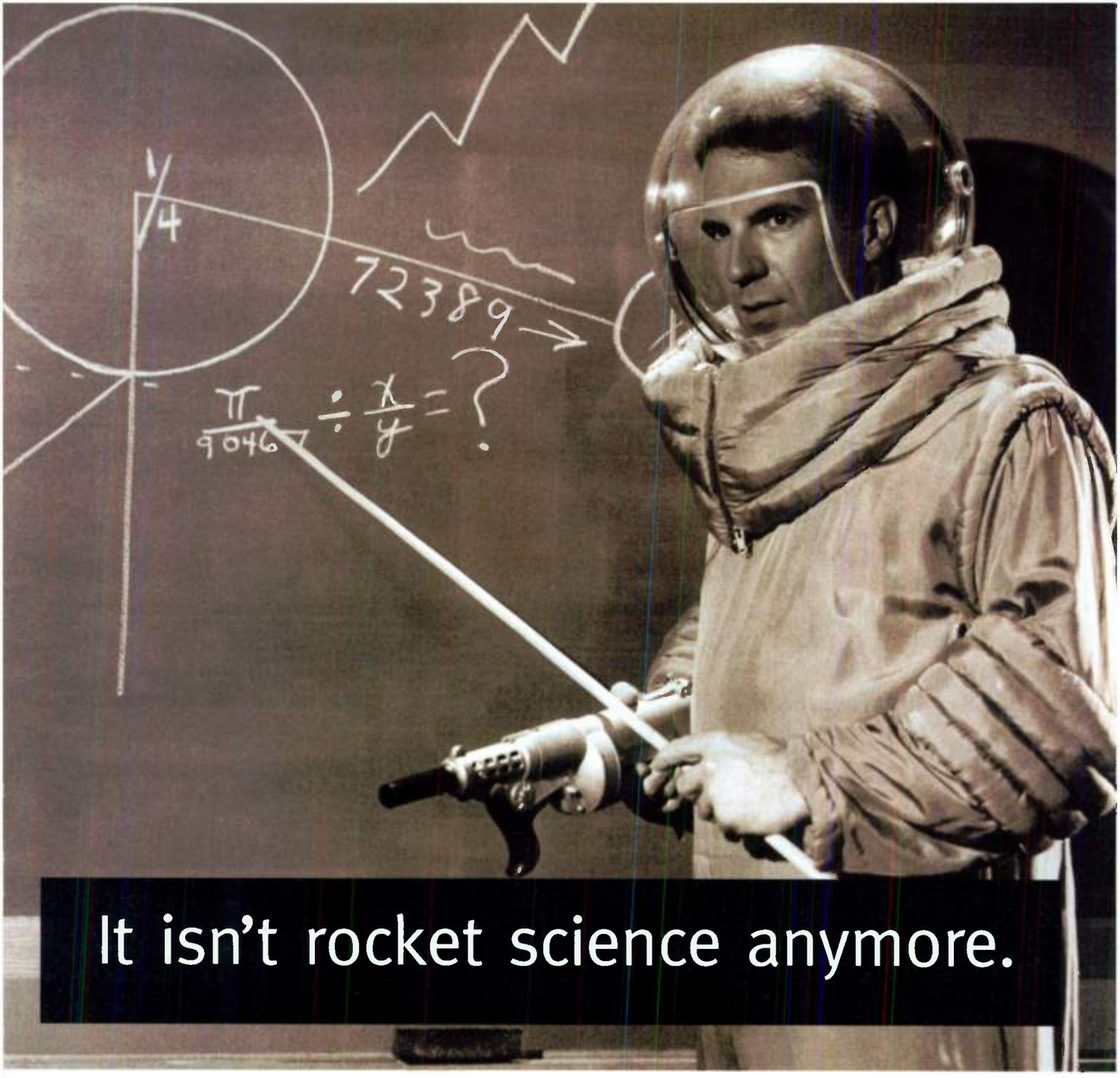
A couple of weeks later, I called the 828 back into action. I was working on a second show for Six Flags, but this one involved writing music using Coda *Finale* and conducting an ensemble of string, brass, and woodwinds. After two days of recording the rhythm section first and then recording the orchestra, the mix engineer, the producer, and I launched into the dreaded all-night mixing session. So what does that have to do with the 828?

The problem was that the show's opening was moved up two days. That meant that the mixes had to be completed the night of the orchestra date. I still needed to overdub timpani, orchestra bells, vibes, xylophone, and a few synth textures, which I originally planned to do the following day at my studio. Luckily, I had stereo submixes of the rhythm section from the day before imbedded in my original click-track sequence files. So once again, I powered up the PowerBook, the XV-5080, and the 828.

While the engineer and producer built up the main mixes in Studio A, I

828 Specifications

Analog Mic/Line Inputs	(2) Neutrik combo XLR and ¼" with preamps and phantom power
Analog Line Inputs	(6) balanced ¼" (+4 dBu)
Analog Line Outputs	(8) balanced ¼" (+4 dBu)
Main Analog Outputs	(2) balanced ¼" (+4 dBu)
Digital I/O	(1) optical in (Lightpipe or S/PDIF); (1) RCA in (S/PDIF); (1) optical out (Lightpipe or S/PDIF); (1) RCA out (S/PDIF)
A/D Converters	24-bit, 64× oversampling
D/A Converters	24-bit, 128× oversampling
Sampling Rates	44.1, 48 kHz
Sync	(1) 9-pin ADAT in
FireWire	(1) IEEE 1394 port
Footswitch	(1) ¼" TS, software programmable
Headphones	(1) ¼" TRS stereo
Power Supply	internal; IEC connector
Dimensions	1U × 5" (D)
Weight	3.75 lb.



Introducing Finale 2002. Easy to use. Easy to learn. Easy everything. See for yourself at www.codamusic.com/em. It's easy.

"Finale is so much easier to use now... and still the most powerful!"
Don Pederson, *School of Music, University of Tennessee at Knoxville*

"It automatically creates and prints custom exercises for every instrument in my band." Kay Hawley, *Hopkins West Junior High School*

"These new slurs look great... just click and drag!" Robert Piéchaud, *Engraver*

"Finale's new Band-in-a-Box® Auto-Harmonizer makes arranging fast and easy."
William Goldstein, *Composer*

FINALE 2002

Finale®. The world's best-selling music notation software.

codamusic.com/em

© 2001 Coda division of NetMusic, Inc. Finale is a registered trademark of Coda Music Technology. Other products are registered trademarks of their respective companies.

set up my portable rig in the producer's suite. Using my sample library, I began overdubbing MIDI parts and immediately recording them as audio files through the 828. Using an Ethernet connection between Studio A and my laptop, the three of us created an assembly line of new audio tracks and finished the mixes around midnight. I couldn't have done it without the 828.

Again, I was amazed that a setup that small could perform so well. The 828 packs a lot of power into a single rackspace, allowing for professional results with a desktop computer in the studio and with a laptop computer in the field. For a truly portable MIDI setup, a three- or four-space rack could house an 828 with a sampler or synthesizer. For on-the-go audio recording, an 828 with a custom preamp and an equalizer or compressor could fit in an equally small rack yet deliver world-class performance

PRODUCT SUMMARY

Mark of the Unicorn
828
computer audio interface
$795

FEATURES	4.5
EASE OF USE	5.0
AUDIO QUALITY	4.5
VALUE	5.0

RATING PRODUCTS FROM 1 TO 5

PROS: Connects directly to FireWire-equipped computer without additional hardware cards. Eighteen simultaneous channels of 24-bit analog and digital I/O. Balanced +4 dBu operation. Accommodates a wide range of signal levels. Zero-latency monitoring of any analog input or pair. S/PDIF, ADAT Lightpipe, and ADAT sync. Two phantom-powered mic preamps. Easy setup.

CONS: No word clock. Outputs cannot be switched to –10 dBu operation. Doesn't support sampling rates higher than 48 kHz.

Manufacturer
Mark of the Unicorn
tel. (617) 576-3066
e-mail techsupport@motu.com
Web www.motu.com

Perfect Pitch.
Perfect Price.

Presenting the Oberheim OB-Tune Pitch Correcting Plug-In for DirectX PC-Platform. Based on technology developed by Antares for their world-renown "Auto-Tune", OB-Tune brings you a powerful pitch correction tool wrapped in a classic, easy-to-use Oberheim interface. And the best news of all is, it's only $49.99! How's that for perfect.

DownLoad it now, exclusively at WWW.MUSICYO.COM

THE WORLD'S MOST POWERFUL MUSIC NOTATION SOFTWARE

- Fastest input available
- Unique layout options
- Unequalled MIDI playback
- Parts and scores linked
- Sell your sheet music from your **FREE** webpage on noteheads.com!
- Available for Windows and Macintosh

Download Igor Engraver – Get **30 days' free use!**

NoteHeads
WWW.NOTEHEADS.COM

»We were totally seduced by Igor Engraver«
– Macworld

Igor
ENGRAVER

Developed in collaboration with Esa-Pekka Salonen

virtually anywhere that you can find electricity.

Because my first two projects involved recording only through the digital inputs of the 828, I later tested the analog inputs by recording a handful of MIDI tracks straight into the unit. Six of the 828's inputs are only ¼-inch, but channels 1 and 2 sport Neutrik combo jacks. Because those two channels are phantom-powered, you can connect any pair of microphones directly to the 828 without additional hardware (except mic cables).

The mic preamps don't sound bad, either. They're not as quiet as high-priced studio preamps, but they sound better than the preamps in most mid-level mixers and even as good as some standalone preamps.

The ¼-inch inputs have a wide range of available gain, letting them accommodate almost any signal level. The input trims are linked in pairs, so raising the gain of channel 5 also affects 6 and so on, but that shouldn't be a problem. The 828's line-level inputs sound great and match the level of audio quality found in MOTU's other interfaces.

WISH LIST

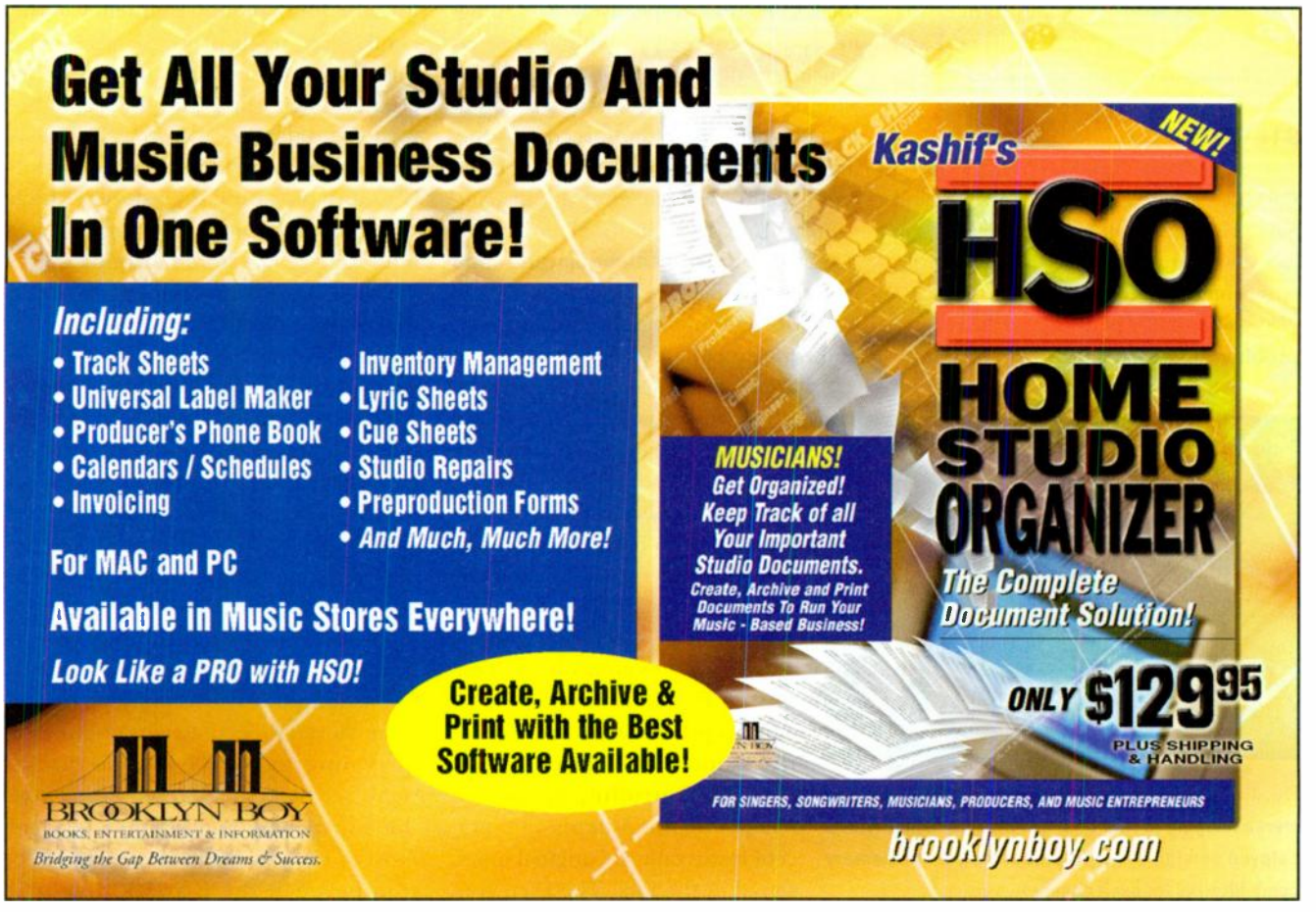
In a perfect world, I would like the ability to switch the outputs on the 828 to –10 dB operation for semipro studio setups. Because I don't always work with stereo inputs, it would be nice to have independent input trims for each channel rather than being locked to pairs for channels 3 through 8. I also wish I could set the digital inputs—better yet, all inputs simultaneously—to the no-latency monitoring output instead of being limited to a single analog input or pair.

However, individual input trims for each channel would mean more knobs, and monitoring the digital inputs would mean more D/A converters. Fulfilling any of my wish list would necessarily result in a more expensive audio interface. For the price, you really can't beat the 828's feature set.

THE INTERFACE AGE

The MOTU 828 is an excellent audio interface for pros and for novices. It's easy to use, the analog I/O sounds great, the digital I/O is versatile, and the monitoring features solve many problems associated with host-based computer recording. It works great in setups that don't require more than eight simultaneous inputs. Moreover, by press time, MOTU's Web site will offer new drivers that let you use multiple 828s with a single computer using a FireWire hub.

The 828 is a great solution for those who need to do professional recording on a laptop or a computer without PCI slots, such as the Apple iMac. Among affordable audio I/O devices, it may be the single most flexible unit available for laptops. I'm sure you'll be seeing plenty of MOTU 828 interfaces in studios and on the road.



P. S. P.

STEREOPACK AND MIXPACK (MAC/WIN)

Two VST effects bundles for tracking, mixing, and mastering on a budget.

By Len Sasso

StereoPack and MixPack are two VST plug-in bundles, from Professional Sound Projects (PSP) in Poland, that offer a broad range of mixing and tracking tools at a modest price. StereoPack contains four plug-ins to create, enhance, and correct stereo imaging and comes with a graphic stereo analyzer. MixPack comprises four plug-ins for bass and treble enhancement, saturation, and compression. With a VST host program, the PSP plug-ins can process solo tracks, enhance submixes, and polish final masters. Each plug-in includes numerous presets.

STEREOPACK

The StereoPack bundle contains *StereoController, PseudoStereo, StereoEnhancer,* and *StereoAnalyser.* With those plug-ins, you can view, simulate, manipulate, intensify, and repair an audio file's stereo image.

StereoController is designed to reduce problems in a stereo mix. Four sliders let you balance the left and right channels, the mono and side components, and the left and right side components. You can also swap channels, phase-invert either channel, and pan the signal's mono component. Side-mono and left-right meters provide visual feedback.

In addition to making stereo repairs, two *StereoControllers* in series can remove vocals for karaoke recordings. That technique relies on the assumption that the solo material is panned near the mix's center. The idea is to invert one stereo channel's phase and then mix it with the other channel to reduce or eliminate a solo vocal performance. You can move the solo to the center with the first *StereoController*'s rebalancing controls and then invert the phase and sum the channels with the second *StereoController.* To nudge the solo into position, *StereoController* has separate control of the side balance, channel balance, and center panning.

PseudoStereo and *StereoEnhancer* use delay lines to simulate stereo from a mono track and to manipulate a stereo track's imaging, respectively. Both plug-ins operate on the principle that when you mix a delayed version of a signal with itself, some frequencies are attenuated as others are reinforced, producing a comb-filtering effect in which the comb "teeth" are harmonically spaced.

PseudoStereo mixes normal and phase-inverted versions of the delayed signal with the original. The result is two channels with complementary attenuation and reinforcement frequencies. If you apply *PseudoStereo* to stereo tracks, it first mixes them to mono and then back to stereo—not desired typically, but sometimes effective.

StereoEnhancer performs the same trick on both channels of a stereo input signal. Except for providing three modes to remix the enhanced stereo channels, *StereoEnhancer*'s controls are identical to *PseudoStereo*'s (see **Fig. 1**). The Depth control determines the amount of delayed signal, thereby controlling the stereo image's depth. A depth of 0 percent leaves only the original mono signal in the mix. The Freq control actually sets the delay time within 1 to 50 ms, but because that control specifies the fundamental frequency of the comb filter, its display is in hertz. The Emph control specifies the cutoff frequency of a highpass filter applied before the delay line. Higher emphasis settings leave low frequencies sounding more monaural than stereo, which adds realism because lower frequencies tend to have less stereo imaging.

StereoAnalyser is a software oscilloscope that displays stereo imaging by separating the common (mono) and side-signal (difference) parts of an audio file's stereo signal. The oscilloscope displays the levels of those two parts on its vertical and horizontal axes, respectively. The real-time signal is displayed in light green, and a Hold option displays the signal over time in dark green. You can switch the meters to show the levels of either the left and right stereo channels or the mono and side signals. For example, in two analyses of the same stereo mix, the right channel is phase-inverted in the analysis on the right (see **Fig. 2**). In a proper stereo mix, the mono component dominates, and most of the trace is in the vertical section between the L and R diagonal

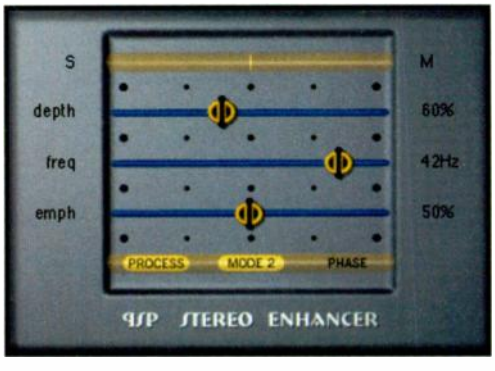


FIG. 1: *StereoEnhancer* provides tools to manipulate stereo imaging in real time by mixing a signal with a delayed version of itself, producing complementary comb filtering for each channel.

PRODUCT SUMMARY

Professional Sound Projects
StereoPack (Mac/Win)
audio plug-in bundle
$24

FEATURES	3.5
EASE OF USE	4.0
AUDIO QUALITY	4.0
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: Great tool for stereo enhancement and repairs. Graphic stereo analysis.

CONS: Controls sometimes touchy. Stereo simulation not always convincing.

Manufacturer
Professional Sound Projects
tel. 48-22-601-963-173
e-mail contact@psp-audioware.com
Web www.pspaudioware.com

firewire storage is here!

See M Project at the AES Convention: Jacob Javits Center, New York City, Sept. 21-24, at Glyph (booth #1330) or MOTU (booth #550)

introducing...

GLYPH M Project FireWire Storage

Mac OS Windows

M Project is the new FireWire hard drive for your MOTU hard disk recording system from Glyph Technologies. M Project adds up to 75 GB of audio storage to your MOTU rig in seconds, backed by Glyph's legendary service and support. M Project is the only MOTU-approved FireWire drive for the 828 and all MOTU PCI-324-based systems, including the 2408mkII, 1296, 1224 or 24i. M Project easily shares the FireWire bus with the 828, and even allows you to connect multiple 828s to your computer. And M Project is the ideal alternative to SCSI drives because it frees up a PCI slot. So call Sweetwater today and ask about M Project, the ultimate storage solution for MOTU hard disk recording.

© 2001 Mark of the Unicorn, Inc.

Now available *exclusively* at Sweetwater

Sweetwater
music technology direct™
Authorized Reseller

Call today!
1-800-222-4700
www.sweetwater.com

lines. If the differential component dominates and the trace is mostly horizontal, you may have problems with phase, mono compatibility, and excessive spread. In the example, inverting the phase of one channel wipes out the signal's mono component.

StereoAnalyser is invaluable for setting up and analyzing the results of the additional StereoPack plug-ins. If you insert *StereoAnalyser* immediately after one of the others, you can toggle the extra plug-in in and out of the signal path to analyze its effect. *StereoAnalyser* is also useful at the end of the signal path for providing visual feedback when setting up a mix.

MIXPACK

MixPack contains four plug-ins—*MixBass, MixTreble, MixSaturator,* and *MixPressor*—in mono and stereo versions. The first two process a signal's low- and high-frequency components, and the latter two provide saturation and compression.

MixBass splits the signal into low- and high-frequency components. The lows are routed through a downward compressor, followed by a coloration stage that simultaneously applies low-shelf filtering and adds harmonics to enhance the bass signal. The highs are then mixed back in, and the signal passes through a saturation stage. That emulates analog saturation and lets you boost the signal about 3 dB without audible distortion.

As its 21 factory presets show, *MixBass* has applications that go well beyond bass-track processing. *MixBass* is effective for subtly warming a final mix, punching up drum loops, and enhancing the low end of pads and keyboards. Particularly useful is the ability to compress and color the bass and then to apply low-cut shelving.

MixTreble consists of five processing stages: a hiss remover, a high-frequency expander, a high-frequency stereo enhancer, a coloration stage for adding high-frequency harmonics, and a soft saturator. To conserve resources, you can independently toggle each stage on and off for a variety of effects combinations.

MixTreble's hiss remover does a nice job of de-essing vocals, but *MixTreble* is best used for adding color and sizzle to percussion tracks. On most other material, the effects were a bit hard to tame, and the results seemed somewhat harsh.

MixPressor is a soft-knee limiter followed by an optional hard limiter. To control the limiting effect, *MixPressor* passes the signal through a variable Q, bandpass-filtered sidechain. You can audition the sidechain signal for setup purposes. The main limiter has controls for threshold (labeled Compress and calibrated in percentage), Attack (with optional delay), Hold, and Release. The last three controls and the sidechain give the limiter compressor-like characteristics; for example, a delayed, slow attack allows transients above the peak limit. An optional automatic makeup feature compensates for the level reduction caused by limiting. The hard limiter absolutely limits signal peaks, letting *MixPressor* function as a maximizer. The second limiter's look-ahead option adds a 2.2 ms delay to soften the effect.

With careful tweaking, *MixPressor* offers useful limiting functions. Because introducing unwanted audio artifacts is so easy, however, it is better used on individual tracks than on mixes. On percussion tracks, in which coloration is often the goal, *MixPressor* is a handy tool.

MixSaturator's saturation algorithm applies one of seven nonlinear distortion curves to the signal (see **Fig. 3**). Using the Shape slider, choose from three tube emulations, three analog-tape emulations, and one digital-clipping emulation. The main saturator is preceded by optional bass saturation and treble compression sections. For postbass and -treble processing, a flexible metering scheme lets you monitor the peak and root mean square levels of the input, the output, or the input to the main saturator.

Subtly applied during mixdown and mastering, *MixSaturator* adds warmth, especially to low-quality, hard-edged digital recordings. It can also add presence to almost any track. If pushed over the top, *MixSaturator* can seriously mess with the harmonic content of a track or a mix; such an effect can be useful with hot guitar and synth leads or with any material you want out front that can stand some distortion. The 24 factory presets include generic settings for most contexts.

BY THE BUNDLE

StereoPack and MixPack are available stateside only as downloads from the Professional Sound Projects Web site. You

PRODUCT SUMMARY

Professional Sound Projects
MixPack (Mac/Win)
audio plug-in bundle
$100

FEATURES	4.0
EASE OF USE	3.5
AUDIO QUALITY	3.5
VALUE	5.0

RATING PRODUCTS FROM 1 TO 5

PROS: Great value. Wide variety of useful effects.

CONS: Controls sometimes touchy. Care needed to avoid unwanted artifacts.

Manufacturer
Professional Sound Projects
tel. 48-22-601-963-173
e-mail contact@psp-audioware.com
Web www.pspaudioware.com

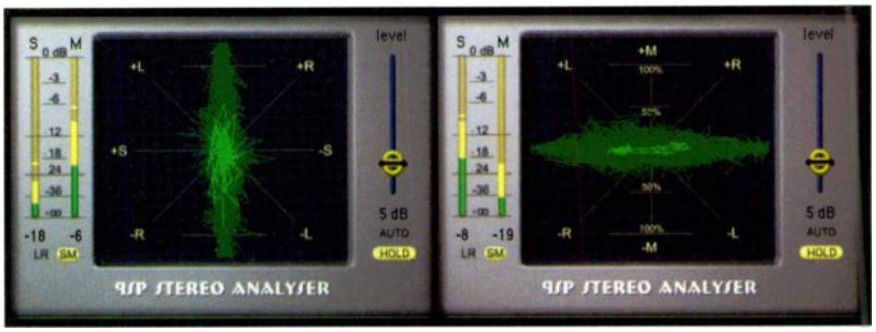
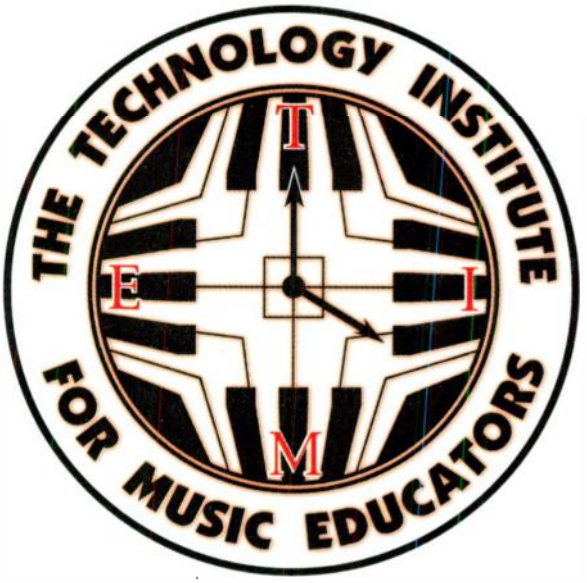


FIG. 2: In these snapshots of *StereoAnalyser*'s oscilloscope display, the analysis on the left shows a well-mixed stereo image and the right view shows the same mix with one channel phase-inverted.

Don't miss the

TI:ME

National Music Technology in Education Conference!



in conjunction with the

MENC National Conference
Nashville, TN
April 10-13, 2002

TI:ME, the Technology Institute for Music Educators, was created exclusively to help music educators learn how to integrate technology into their everyday teaching strategies. Join TI:ME at our national conference and take advantage of these resources:

- Continuous technology sessions
- Lecture and hands-on rooms fully-equipped with keyboards and Apple and Windows computers
- Product presentations and instruction
- Multiple sessions for novices, intermediate and advanced users
- Electronic music concerts
- New educational products

The TI:ME National Conference, in partnership with MENC Music Educators National Conference, is supported by NAMM, the International Music Products Association and by IAEKM, the International Association for Electronic Keyboard Manufacturers.

Find out more:
www.ti-me.org
e-mail: timeconference@stevenestrella.com
or call Rocky J. Reuter, Conference Chair
at 614-236-6226

The Technology Institute for Music Educators • Attn: John Dunphy • 305 Maple Ave. • Wyncote, PA 19095

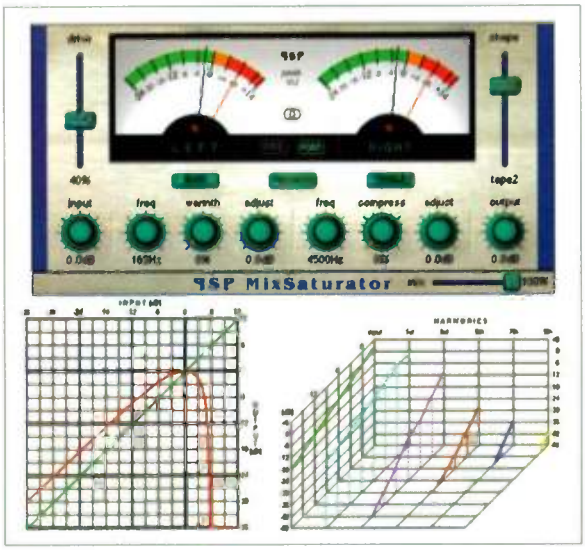


FIG. 3: *MixSaturator* **emulates analog tube and tape saturation with seven different distortion curves. Graphs of each curve and the resulting harmonic distortion are included in the documentation.**

can download and buy MixPack plug-ins for $30 each. The site has demo versions of the plug-ins and MP3 audio examples.

HTML documentation and plain text files are provided for the bundles, and MixPack includes a PDF manual. The documentation is more than adequate, though some explanations suffer in translation. It's well illustrated, featuring block diagrams of the signal flow and control structures of some plug-ins.

THE FULL EFFECT

StereoPack and MixPack's audio quality is very good, and the MixPack plug-ins are surprisingly versatile. StereoPack's plug-ins are CPU-efficient and add only a small percentage to overall CPU usage. The MixPack plug-ins do more intense processing and use more resources. Depending on settings, they use 10 to 30 percent CPU power on my Mac G3/300 MHz.

The PSP bundles are a great value with useful applications. Some controls are touchy or oddly labeled, but the control panels are graphically well designed; the metering is excellent too. StereoPack and MixPack won't satisfy all tracking and mixing needs, but they offer unique digital signal processing solutions to fill a few holes in your audio-editing kit.

Minimum System Requirements

StereoPack and MixPack

MAC: G3/300; 64 MB RAM; OS 8.5; SVGA display; VST host software

PC: Pentium/200; 32 MB RAM; Windows 95/98; SVGA display; VST host software

Len Sasso *is a writer and composer living on California's central coast. Contact him through his Web site at www.swiftkick.com.*

Rock Star Rule Number 1: Never Get Too Wrapped Up in Your Work

Experimenting with effects is key to making great music. But you should never let your effects control *you*. Too many cords connected to too many pedals can cause you nothing but trouble and frustration.

That is why Furman Sound created the *SPB-8*, the first-of-its-kind stereo pedal board. It is designed to hold up to eight pedal effects or boxes in place on a velcro surface, and features tough metal construction that holds up to the rigors of the road. What is more is that the *SPB-8* uses Furman signature power conditioning, with two levels of surge and short-circuit protection, as well as RF and EMI filtering. Each DC output is protected, so if one pedal goes out, your others continue to function.

You get all of this for just under $400 - once again, Furman comes through with just the thing for creating music with the greatest of ease. And by getting all of those extra cords out of the way, the *SPB-8* will also keep you from taking stage dives that are not part of the act.

FURMAN

FURMAN SOUND, INC., 1997 South McDowell Blvd., Petaluma, California 94954-6919
Phone: 707-763-1010, Fax: 707-763-1310, Website: www.furmansound.com, E-mail: info@furmansound.com

APPLY TODAY!
Musician's Friend Platinum Member
3 MONTHS SAME AS CASH!
MINIMUM PURCHASE OF $299

Musician's Friend

THE MUSICIAN'S CHOICE FOR GREAT GEAR AT GREAT PRICES!

emagic Unitor8 Cross-Platform Hardware
705934Y
List $799.00
$499.99

SHURE IT'S YOUR SOUND
KSM27 Studio Mic
270278Y
List $575.00
$299.99

RØDE MICROPHONES
NT3 Mic
271575Y
List $199.00
$149.99

cakewalk SONAR Sonar
705087Y
List $479.00
$299.99
Unlimited audio and MIDI tracks!

MICROBOARDS Technology, Inc.
QD-1 Quic Disc Duplicato
249008Y List $699.00
$599.99

TDK
74-Minute Blank Data 12X CD-R
950156Y List $1.78
ONLY 69¢ each

propellerhead
Reason Software Synth System
708048Y
List $399.00 $279.99

OPEN 24 HOURS A DAY 7 DAYS A WEEK

FREE CATALOG!
ONE-YEAR SUBSCRIPTION

WEEKLY WEB FREE GEAR GIVEAWAY!
WORTH UP TO $1000

CALL TOLL-FREE
800-776-5173
or visit us online at
musiciansfriend.com®

Five Easy Ways To Order!
1. Call: 800-776-5173
2. Click: www.musiciansfriend.com
3. Write: P.O. Box 4520 Medford, OR 97501
4. Fax: 541-776-1370
5. Lease: 800-359-4790

Rapid Delivery!
- Most orders shipped same day!*

45-Day Double Guarantee!
- Money-Back Satisfaction Guarantee
- Best Price Guarantee

*On orders received by 5PM ET Mon.-Fri. Limited to stock on hand; prices subject to change; standard catalog shipping rates apply.

To get your FREE Catalog subscription, fill out this handy coupon and mail to: Musician's Friend, Dept. ELMU, P.O. Box 4520, Medford, OR 97501

Name _____

Address _____

City _____ State _____ Zip Code _____

E-mail address _____

Area(s) of interest:
☐ Guitar ☐ Bass ☐ Keyboard ☐ Drums
☐ Studio (recording) ☐ Stage (PA, lights, etc.) ☐ DJ

SOURCE CODE: ELMUAK

WAVES

GOLD NATIVE 3.0 (MAC/WIN)

Superbly crafted, pro-quality audio processing and mastering effects.

By Len Sasso

Waves is widely recognized as a company that designs state-of-the-art digital signal processing (DSP) software. Its Gold Native bundle is a comprehensive collection of 20 DSP plug-in effects for tracking, mastering, and multimedia production. The plug-ins range from bread-and-butter processes such as compression and EQ to truly esoteric tools such as *MondoMod* and *Enigma*. Gold Native 3.0 is a major upgrade including support for audio rates as high as 96 kHz, additional plug-in formats, more effects, and improvements in the user interface. The effects are available separately or as part of smaller collections, but the Gold Native bundle represents a significant cost savings to buying them individually. You can download a fully functional 14-day demo of the bundle from the Waves Web site.

Gold Native plug-ins harness the host computer's processing power. The plug-ins support VST, MAS, Real Time AudioSuite (RTAS), and AudioSuite plug-in formats on the Mac and DirectX and RTAS on the PC. Support for multiple plug-in formats is a big bonus, because you will undoubtedly want to use the effects in several host applications—a digital audio sequencer, a sample editor, and CD-mastering software, for example. A more expensive TDM bundle utilizes the DSP power of the TDM hardware and includes one additional effect, *PS22-Pseudostereo*.

I used the VST version of the plug-ins, and the host application was *Logic Audio Platinum* 4.7 running on a Power Mac G3/300 MHz with 128 MB RAM allocated to *Logic*. Most Gold Native plug-ins include a full-blown version and several reduced-feature variations that minimize CPU usage. By choosing the lighter versions whenever possible, I could usually run six to eight effects, and often more, simultaneously.

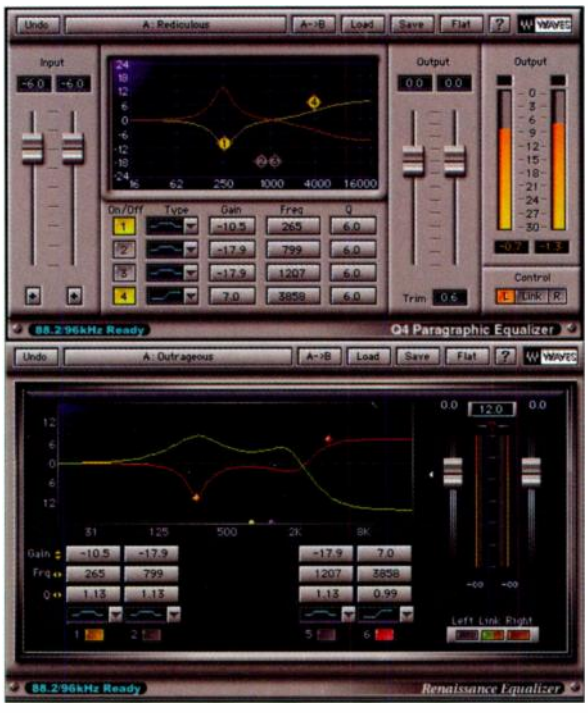


FIG. 1: Waves' *Q4* (top) and the 4-band version of *Renaissance EQ* (bottom) provide full parametric equalization, and you can configure each band for bandpass, lowpass, highpass, low-shelf, or high-shelf filtering.

WHAT'S IN THE BOX

It was a real pleasure to open Gold Native's box and find more than a CD and some cardboard filler rattling around inside. The bundle comes with several hundred pages of well-written and conveniently organized printed documentation. (Adobe *Acrobat* PDF files are also included.) Each effect's documentation contains a Quick Start section, a detailed look at the controls, and a set of well-thought-out examples. Often, there is a tutorial about the theory behind the effect.

Minimum System Requirements

Gold Native

MAC: PPC 604e/200 (G3 or G4 recommended); 64 MB RAM; OS 8.5; 800 × 600 display; compatible host software

PC: Pentium/266; 32 MB RAM; Windows 95/98/NT/2000; 800 × 600 display; compatible host software

Installation from the CD is relatively painless, though on my non–Pro Tools system, the installer kept asking me to choose a Pro Tools host. Once installed, Gold Native runs in fully functional Demo mode for 14 days while you obtain a response code for its challenge-and-response authorization scheme. That authorizes a single hard drive, but in the event of a hard-drive crash or computer upgrade, you can request a replacement authorization. You can register and authorize Gold Native online, by fax, or by mail. Online authorization is easy and instantaneous.

Unlike some plug-ins, Waves plug-ins do not need to be duplicated for each host application. Instead, they are always accessible from the Plug-ins folder inside the Waves folder. Because the plug-ins and their Setups (aka presets) are not duplicated, any Setups that you create in one host are immediately available in all hosts—a terrific convenience.

Although graphic differences exist, the user interface is functionally the same for each Waves plug-in. In addition to buttons, sliders, and numerical controls, many plug-ins feature a graphic display in which you can change values by clicking and dragging. Each EQ, for example, has a graphic display of the EQ curve for controlling the center frequency, gain, and Q of each EQ band. Most plug-ins have easy-to-read input and output meters with LED and clip indicators. Many also have a Trim indicator that tracks the output and shows the adjustment necessary to avoid clipping. As a further convenience, clicking on the Trim indicator automatically adjusts the output levels.

Each plug-in comes with a number

of factory Setups accessible from the Load menu at the top of the plug-in's display. The factory Setups are permanent, but you can add your own Setups to the menu and save them in separate Preset files (on a per-project basis). Each plug-in holds two active Setups at a time, which is ideal for making A/B comparisons as you work. You can also copy and paste settings from one parameter control or group of controls to another, letting you create new Setups by mixing and matching settings from existing Setups.

The Gold Native plug-ins sound great. You will use some often and others sparingly. One version of EQ or compression will suit some users, and another version will suit others; nonetheless, the sound is uniformly clean and smooth, and you are unlikely to find fault with the sound quality of any of them.

For this review, I divided the plug-ins into five broad categories: equalization, compression, reverberation, special effects, and mastering. The division is somewhat arbitrary because several effects perform multiple functions.

EQ PAR EXCELLENCE

The granddaddy of all Waves equalizers is the *Q10 Paragraphic Equalizer*. Each band can be configured for bandpass, lowpass, highpass, low-shelf, or high-shelf filtering. In the top of **Fig. 1**, which shows *Q4*, the 4-band version, the boost and cut curves have the same shape, and Q (a measure of the EQ bandwidth) is active only for the bandpass filters. The Gold Native equalizers are in true stereo, which allows you to apply different equalization to each channel. Normally, you would operate in Link mode and apply the same equalization to both channels, but separate EQ is useful for effects such as pseudostereo.

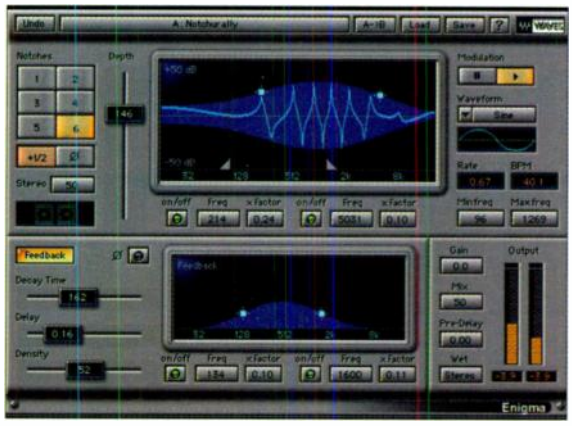


FIG. 3: *Enigma* is a complex notch-filter effect with a rough-edged reverb/feedback loop (bottom). The notch can be modulated by the LFO, and each section has a Window filter (light blue regions).

Q10 comes with a huge library of Setups covering the more exotic things you can do with a parametric equalizer. Examples include pseudostereo, crossover, band limiting, harmonic combs, hum reduction, distortion, pre- or de-emphasis, and tilting. The *Q10* manual devotes 78 pages to describing the Setups.

The other general-purpose parametric equalizer in the Gold Native bundle is the *Renaissance EQ*, which comes in 1-, 4-, and 6-band models. (For a review of the *Renaissance EQ* and the *Renaissance Compressor*, see the Native Power Pack II bundle review in the May 2000 issue.)

In the bottom of **Fig. 1**, the *Renaissance EQ* 4-band model has settings similar to those of the *Q4*, but with different EQ curves. The *Renaissance EQ* boost curve has a different shape than the cut curve. By providing a narrower band for the same amount of attenuation, the narrow cut curve makes the *Renaissance EQ* ideal for notch filtering. Unlike the *Q4*, the *Renaissance EQ*'s Q is active for all filters; that changes the rolloff of the highpass and lowpass filters and produces humps in the shelf filters. The curves are reminiscent of the old Pultec EQs after which the *Renaissance EQ* was modeled.

AudioTrack is a hybrid consisting of a 4-band parametric equalizer and a wideband compressor. It is essentially a no-frills version of *Q4* followed by *C1*, Waves' basic workhorse compressor. *AudioTrack* is a CPU-efficient plug-in and is all you need for about 90 percent of tracking jobs. If you use instances of *AudioTrack* on several tracks, you have the advantage of being able to exchange Setups between those tracks.

For tracking, *AudioTrack* is a good place to start. When you need compression followed by EQ, more EQ bands, other compression features, or other effects, you can always go back to using separate plug-ins.

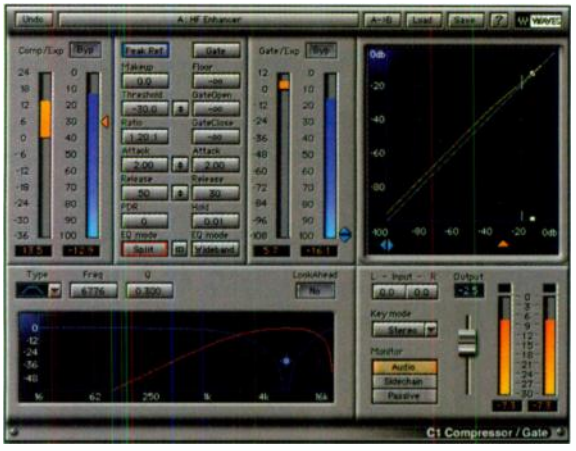


FIG. 2: *C1 Compressor/Gate* combines a compander with a gate/expander. The signal can be split (bottom left) into active (red) and passive (blue) zones. The active zone can be used for the main signal and the sidechain.

COOL COMPRESSION

C1 Parametric Compander is Waves' primary compressor. It is available in four versions—*C1 Compressor, C1 Gate, C1 Compressor/Gate,* and *C1 Compressor/Sidechain*—which variously offer optional gating, filtering, and sidechaining. The full-blown version, *C1 Compressor/Gate,* includes all three. The Gate/Expander section is typically used to manage low-level signals, such as noise. The sidechain lets one signal control the level of another, which is useful for ducking. When you don't need to get fancy, use the *C1 Compressor;* it offers no gate, no ducking, no filter, and no wasted CPU cycles. Gold Native also includes a

dedicated *DeEsser*. It doesn't do anything that you can't do in *C1*, but it is CPU-efficient and easier to use.

The filter section, one of *C1*'s most powerful features, uses a lowpass, highpass, bandpass, or band-reject filter to define active and passive regions (see **Fig. 2**). The filter, which you can apply to the sidechain and the main signal, has a variety of applications, including classic compression, expansion, gating, dehissing, de-essing, noise reduction, dynamic equalization, and so forth. Setups are supplied for each task, and the documentation has more than you ever wanted to know about parametric companding.

The other Gold Native compressor, *Renaissance Compressor*, emulates vintage hardware compressors. It is optimized for warmth of sound and simplicity of operation. Optional automatic release control (ARC) can be applied with Opto or Electro response, which increases or decreases, respectively, the release time near the threshold. An optional warmth enhancer adds low-frequency harmonics at deeper compression levels. The signal path ends with a hard limiter similar to *L1* that is applied after compression.

The newest and most sophisticated offering in the compression category is the *C4 Multiband Parametric Processor*. (For a review of *C4*, see the February 2001 issue.) The incredibly powerful hybrid applies separate compression to four parametric-equalizer bands. You could also think of the plug-in as a 4-band dynamic equalizer, because separate bands of compression change the EQ curve.

C4's compressors replace the standard threshold control with a Range control. The Gain setting applies when no compression is occurring, and the Range setting indicates the gain change at maximum compression. That flexible arrangement lets you apply compression at low thresholds without getting extreme gain changes at high signal levels, because the Range setting limits the maximum gain change.

C4 works well as a mastering tool when frequency bands call for different sorts of compression and EQ. It also offers greater flexibility in noise reduction

Where do you get one of the world's best drummers for your next session...
...for less than $10 a track?
DISCRETE DRUMS
A World Class Drum Library
Multitrack drum performances you can mix and process yourself - 24 bit, 8 discrete tracks
To Order and Listen to Samples & Demos Online:
WWW.DISCRETEDRUMS.COM

West L.A. Music...Superstars, Super-Prices, Superstore!
West L.A. Music's Don Griffin with jazz and pop keyboardist, George Duke
Legendary funk star, Rick James, with West L.A. Music's Derek Snyder
Recording artist, Tom Petty, with West L.A. Music's Philip Wolfe
Producer, Phil Ramone, with West L.A. Music's George Adjieff
"Shop Where the Pros Shop"
We Will Beat Any Deal!
West L.A. Music
Call Today 310-477-1945
TODAY'S HOTTEST PRODUCTS
The largest and most complete selection of name brand music, audio and recording products— in stock and ready for delivery!
GUARANTEED LOWEST PRICES
"We will beat any price from any authorized stocking dealer anywhere in the US."
GREAT SERVICE & EXPERT ADVICE
Whether you're building a world class studio, or a project studio at home, playing the largest concert arena or a local club, we'll help you achieve your goals.
TOTAL SATISFACTION
We guarantee your complete satisfaction with the products and services we recommend.
www.westlamusic.com • Email: sales@westlamusic.com • Fax: 310-477-2476

broadjam

highest ranked broadjam artists: 10.2001

Artist: Robb Roy **Song:** What If
Genre: Alternative

Artist: Brassnucks **Song:** Digital Domain
Genre: Rap / Hip Hop

Artist: deepBluesecret **Song:** Glazier
Genre: Electronic

Artist: Natalie Brown **Song:** You Gotta Believe
Genre: R & B

Artist: Doug Cannon **Song:** River of Blues
Genre: Blues

unleash your songs

Get it up

Don't want to deal with the hassle of encoding and uploading your music? Send it to Broadjam, and we'll do it.

Get it out

We'll get it up on our site and then get it out to all the best Internet music sites.

Get it back

Oh you'll get feedback all right. From fans, peers, industry pros, professional guest reviewers and even a moron or two.

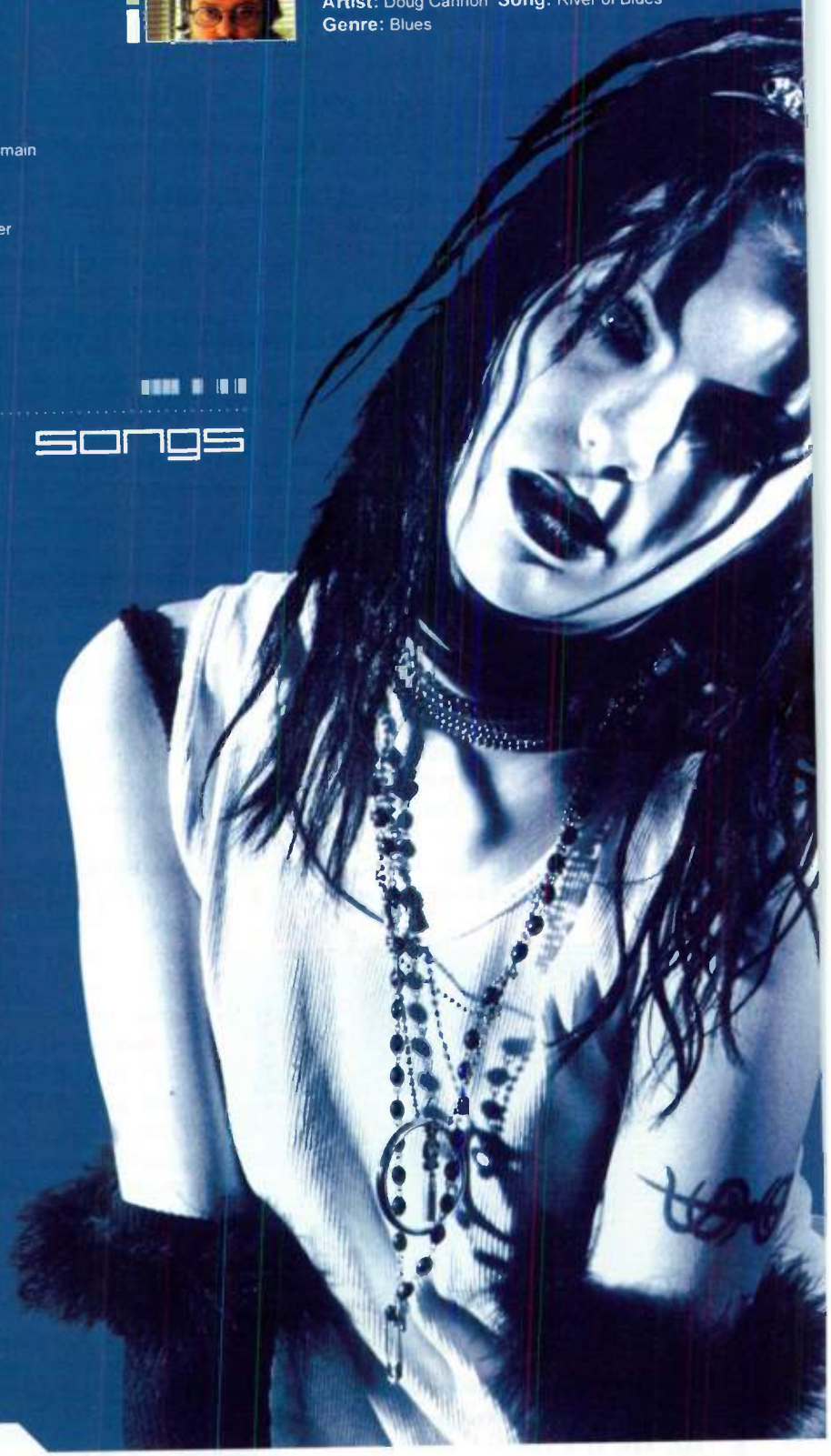
Get a homepage

A well-designed world-class page that you'll be proud to call home.

Get it on

Whatever you do, get it online and give your music a chance. And give us a chance to do it for you. If you want to talk to a human and ask questions, call us toll free at 877-527-3651. If you prefer email, we can deal with that as well.

CustomerService@Broadjam.com



Broadjam Corporation
1101 State Highway 69, #6 | New Glarus, Wisconsin 53574
608-527-3633

www.broadjam.com

the processing in a frequency window. You can configure the notch filter with as many as six and a half notches. The supremely unpredictable Depth control sets the depth of the notches; the notch effect is often much more pronounced when the depth is set to 0. The notches can be swept by an LFO with sine, triangle, square, saw up, and saw down waveforms. The feedback-reverb section is essentially a lo-fi, early-reflections unit with controls for delay, density, feedback amount, and phase inversion.

Enigma was effective with a range of material, including vocals, drum loops, keyboards, solo instruments, and even submixes. The results were always interesting and frequently startling. For example, using a square-wave LFO to modulate the notches with extreme feedback settings and the Depth control set to 0 made a kick-and-snare loop sound like a bell tree played with hard mallets.

MaxxBass. This effect takes advantage of the psychoacoustic phenomenon in which the ear re-creates a missing fundamental from the presence of its harmonics. (For a *MaxxBass* review, see the July 1998 issue.) In the context of low-frequency material, that means that you will "hear" the bass, though the speakers may not reproduce it. *MaxxBass* analyzes the low-frequency part of the signal and creates the associated harmonics. It can typically increase the perceived frequency response of a speaker by about two octaves. I tried it through some cheap car speakers and was amazed.

MetaFlanger. This is a classic delay-line flanger. The signal is mixed with a delayed version of itself, and the delay time is continuously varied. Flanging causes some frequencies to be attenuated while others are reinforced—a comb-filter effect in which the notch frequencies (the comb "teeth") stretch and compress but maintain a fixed harmonic relationship. By contrast, a moving comb-filter effect such as *Enigma* shifts the notch frequencies back and forth but preserves their distance—an effect more akin to phase shifting than flanging.

An LFO with a sine or triangle wave shape varies the delay time, causing the pitch to vary continuously or jump between two values. There is a feedback loop, and the phase of the dry or wet signal (before feedback) can be inverted. The wet signal can also be lowpass or highpass filtered, and delay times can vary from 0.1 to 50 ms. The lower end of the range is often associated with phase shifting and the upper end with chorusing. However, *Enigma*'s swept comb filter offers more authentic phase shifting, and *UltraPitch* is better suited to chorusing.

FIG. 6: The top window of the *PAZ Psychoacoustic Analyzer* displays the frequency spectrum with real-time (lower) and peak (upper) curves. The bottom window analyzes stereo imaging. The yellow level meters show peak channel levels, whereas the blue meter can show the peak or RMS level for the sum of both channels.

MetaFlanger provides a variety of flanging effects and Setups. In addition to emulating traditional analog-hardware flangers, you can use its LFO with a 100 percent wet mix to produce various pitch effects, which is especially useful when applied to percussion. With a mostly dry mix and increased feedback, *MetaFlanger* becomes a rough reverb. You can employ its Stereo control, which sets the phase relationship between the left and right LFO waveforms, to add coloration and to enhance stereo spread to many Setups.

MondoMod. *MondoMod* combines AM, FM, and rotation modulators, all driven by the same multiwaveform LFO. (Rotation is the stereo equivalent of panning a mono signal; you can move a stereo image to the right or left without changing its width.) The first thing that comes to mind with an effect like this is Leslie simulation, and you can indeed use *MondoMod* for convincing rotating-speaker emulations. To that end, the LFO speed affects the FM amount so that the Doppler effect of a rotating source is automatically factored in. In practice that can be rather annoying because it prevents you from getting large frequency sweeps at low LFO rates.

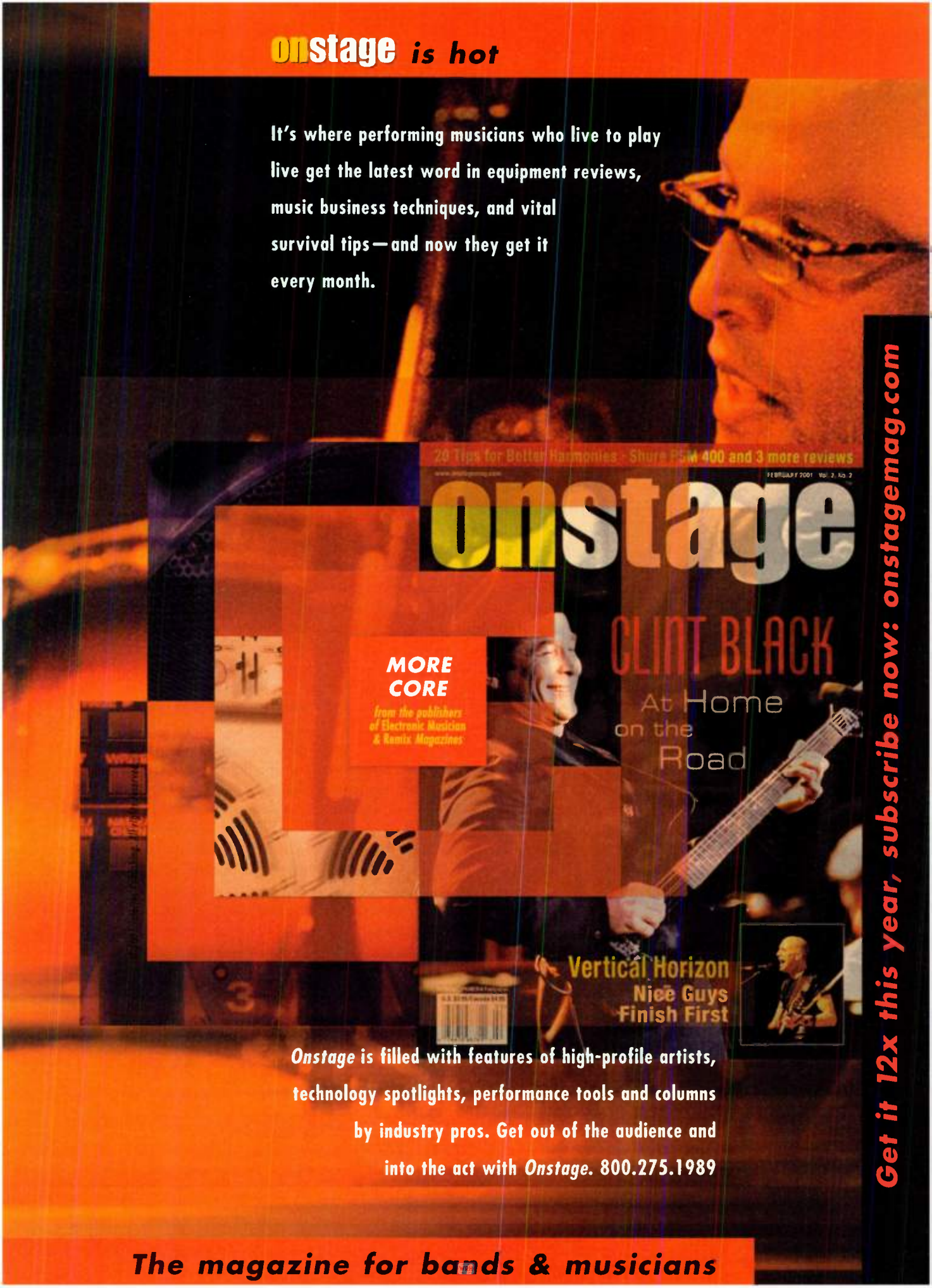
The LFO's multiple waveforms (saw up, saw down, square, triangle, and sine) and extreme range (from 0.01 to 6,000 Hz) make it possible to get audio-rate AM and FM effects. Those effects are interesting when applied to rotation; if you ever wanted to turn a hi-hat into a rainbird, here's your chance. With a 50/50 mix at moderate LFO rates, *MondoMod* can also produce interesting doubling effects.

SuperTap. This multitap delay comes in 2- and 6-tap versions (see **Fig. 4**). The delay time for each tap can be 1 ms to 6 seconds and can be modulated within a 10 ms range by a sine-wave LFO. The huge delay range accommodates everything from chorusing (short tap times with modulation) to complex rhythmic effects. The tap times can be set in time or tempo increments that are based on a tempo that you type or tap in. Unfortunately, there is no MIDI sync for tempo—a surprising omission, to say the least.

SuperTap provides two modes of feedback. In Normal mode, each tap is fed back immediately to the input, whereas in Tap mode, each tap is delayed, giving you a seventh tap of sorts. One of *SuperTap*'s best features is the inclusion of a separate filter (identical to the *Q10* filters) for each tap; that provides you with a lot of latitude in sculpting interesting percussion variations. Finally, you can adjust each

onstage is hot

It's where performing musicians who live to play live get the latest word in equipment reviews, music business techniques, and vital survival tips—and now they get it every month.



Onstage is filled with features of high-profile artists, technology spotlights, performance tools and columns by industry pros. Get out of the audience and into the act with *Onstage*. 800.275.1989

Get it 12x this year, subscribe now: onstagemag.com

The magazine for bands & musicians

tap's pan position and gain independently using a useful interactive graphic display.

UltraPitch. Pitch- and formant-shifter *UltraPitch* offers some interesting twists. It provides one-, three-, and six-voice versions, and even the six-voice version is surprisingly CPU-efficient. Independent control of pitch shift, formant shift, pan position, gain, and delay for each voice is provided (see **Fig. 5**). The Automation control adds a bit of random timing between voices. The parameters are everything you could wish for in a chorus unit, and *UltraPitch* makes an excellent one.

The processing starts with pitch detection, which requires a monophonic source such as a single voice or solo instrument. *UltraPitch* is a mono or stereo effect. If you feed it a stereo track, it processes only the left channel. The ease of setup and accuracy of its pitch-detection section is astonishing. It performs flawlessly on a variety of vocals and solo instruments. Within reasonable limits (roughly a minor third), the one-voice version provides realistic results. The multivoice versions produce convincing harmonization over a broader pitch range.

As a harmonizer, *UltraPitch* probably can get you out of a tight spot. For minor pitch correction and formant adjustments, it's more than adequate. It really shines, however, as a chorus and effects unit; in the latter case, you can stretch beyond the solo, pitched-source restriction. *UltraPitch* can be interesting on percussion, keyboards, and the like.

PLUG-INS FOR MASTERING

Two of the four plug-ins in this category, *L1 UltraMaximizer* and *S1 Stereo Imager,* are typically associated with mastering and remixing. The third, *IDR,* is a dithering utility. The last, *PAZ Psychoacoustic Analyzer* (Mac only), is an analysis tool that is useful anywhere in the signal path.

L1 UltraMaximizer is a peak limiter that utilizes look-ahead techniques to reshape signal peaks without introducing significant audible artifacts. Lowering the peaks lets the overall signal level increase in a way that standard normalizing does not. Set the peak Threshold (typically 4 to 6 dB below the highest peak) and the Output Ceiling, and *L1* does the rest. *L1* is a hard limiter, meaning the output will never overshoot the output ceiling. The plug-in comes in two versions: *L1* for tracking and *+L1* for mastering. The latter adds a comprehensive dithering utility with two types of dither and four varieties of noise shaping.

Use *IDR* if your host platform stores audio at a lower bit depth (always 16 bits, for example) than Waves' internal-processing bit depth (which varies depending on your platform). The plug-in always uses Type I dithering with Normal noise shaping; it is compatible with all forms of dither, and you can use it in consecutive processes. When you bounce tracks, use *IDR.*

S1 Stereo Imager is a stereo repair and enhancement utility. It analyzes the signal for left, center, and right components and then lets you widen, skew (change the symmetry), and reposition the center without affecting the levels of the parts. The full-feature version, *S1 Shuffler,* adds shuffling to enhance the perceived stereo width of the bass. When shuffling results in a bass boost, you can use a BassTrim control to dial it back down. Both versions accept left-right or mid-side inputs and offer channel swapping and phase inversion.

PAZ Psychoacoustic Analyzer has no effect on the signal (see **Fig. 6**). It is an invaluable tool for before-and-after analysis of level, equalization, and stereo imaging. The Frequency Analysis window shows a spectral analysis in real time with an optional peak-hold graph. The Position Analysis window displays stereo imaging and possible out-of-phase spikes. Yellow peak-level meters are provided for each channel, as is a blue sum meter that indicates peak or root mean square (RMS) level. (RMS helps you gauge the effects of compression and limiting.)

PURE GOLD

The Gold Native bundle is a vast collection. The design, attention to detail, and uniformity of the plug-ins' graphical user interfaces make them easier to use than many of their counterparts from other manufacturers. Although it takes a little time to get up to speed with some of the more complex effects, it is unlikely that you will run out of creative alternatives any time soon.

Waves' exemplary documentation goes beyond the minimum requirement of describing the control panels. The tutorials together with the numerous Setup files are a virtual education in themselves. If I had one quibble, it would be that the bundle could use a short overview manual introducing each effect and briefly describing its application.

The Gold Native bundle lives up to its name. It is expensive, but it's a great value considering the uniformly high quality of the plug-ins and the cost of buying them separately. Although some processes are duplicated, the difference in the sound of similar plug-ins makes both versions well worth having. I'd be hard pressed to think of anything that's missing from this package. ❦

PRODUCT SUMMARY

Waves
Gold Native 3.0 (Mac/Win)
audio plug-in bundle
$1,300

FEATURES	4.5
EASE OF USE	4.5
AUDIO QUALITY	5.0
VALUE	4.5

RATING PRODUCTS FROM 1 TO 5

PROS: Top-quality sound. Uniform user interface for all plug-ins. Vast array of effects. Excellent printed documentation.

CONS: Requires a fast computer. No MIDI tempo synchronization.

Manufacturer
Waves
tel. (865) 546-6115
e-mail sales@waves.com
Web www.waves.com

WORLD
REPLICATION GROUP

Superb Mastering
Believable Delivery Dates
No Hidden Extras
Professional Graphics
CD Audio / CD-Rom
Audio Cassettes
Video

1 PANEL, 2 PAGE
WE DO ART

1,000 only $1390.00
500 only $1095.00
300 only $897.00

Price Includes:
art, type, layout
glassmaster, CD's with 3 color label imprint,
2 page, 1 panel insert 4/1, tray 4/0
color proofs, assembly into jewel cases and shrinkwrap

2 PANEL , 4 PAGE
ART SUPPLIED

1,000 only $1290.00*
500 only $965.00*

Price Includes:
glassmaster, CD's with 3 color label imprint
4 page, 2 panel insert 4/1, tray 4/0
color proofs, assembly into jewel cases & shrinkwrap

* from your output ready art files and CD-R master

Please Note: All quantities subject to 10% over or underun to be charged or credited accordingly

DIGITAL CASSETTES
WITH COLOR J CARDS

1000 only $690.00*

Price Includes:
full color J card 4/1
from your supplied film
direct shell imprint
clear box
shrinkwrapped

* up to 25 minutes per side

BULK CD'S

Price Includes:
3 color label imprint
and glassmaster

1000 only $590.00*

* from your CD-R ready master and label film

Get Your Full Color Buyer's Guide Now!

Call 1-800-463-9493

www.worldreplication.com

Member of AFIM

4600 Witmer Industrial Estates, #2, Niagara Falls, NY 14305
In Canada: 1712 Baseline Rd. W., Courtice, ON L1E 2S8

PRESONUS

DIGIMAX

A high-quality 8-channel mic preamp and A/D converter.

By Rob Shrock

The audio world is apparently based on the number eight. Consider, for example, 8-track modular digital multitracks (MDMs), 16-channel mixers, 24- and 32-track recorders, 48 and 96 kHz sampling rates—all are evenly divisible by the magic number eight. One of the first preamp manufacturers to accommodate that concept was PreSonus with its popular M80, an 8-channel mic preamp and mix bus that can serve as a convenient front end for MDMs or other 8-track recorders.

Now PreSonus has unveiled the DigiMax, a single-rackspace 8-channel mic preamp with a bevy of I/O options, including simultaneous digital and analog outputs (see **Fig. 1**). Designed primarily as a front end for digital recorders and digital audio workstations (DAWs), the DigiMax is also convenient for live recording applications. In this review, I'll investigate what this powerful box has to offer.

NOBLE ANCESTRY

The DigiMax employs the same preamp design as the highly regarded PreSonus MP20, M80, and VXP, incorporating eight Class A discrete input buffers followed by a dual-servo gain stage providing 60 dB of preamp gain and 30 dB of headroom. Each channel provides 48V phantom power, a 20 dB attenuation pad, and two distinctive features: a Dual Domain limiter and an equalizer circuit called EQ Enhance. Three LEDs at the top of each channel section provide visual feedback indicating signal present, clip, and limiter active. In addition, each of the DigiMax's first two channels provides a polarity-reverse switch and an unbalanced ¼-inch instrument input. The latter allows the unit to function as a direct injection (DI) box for guitars, keyboards, and other instruments.

The limiter is dubbed Dual Domain because it employs both standard peak detection (the type used in most brick-wall limiters) and root mean square (RMS) detection (more commonly found in compressors). The unit uses high-ratio RMS compression to handle the bulk of the limiting tasks and reserves the peak-limiting portion to catch fast peaks and thus protect the input of the A/D converter from clipping.

The EQ Enhance feature engages a bell-type EQ centered at 1 kHz and extending from 250 Hz to 5 kHz. When it is engaged, it cuts 4 dB at the center frequency.

Completing the front panel are two backlit buttons on the unit's far right: one labeled Sample Rate and the other, Ext. Clock. The Sample Rate button toggles to select from three sampling rates—32, 44.1, and 48 kHz—each with a corresponding LED.

FLIP SIDE

The DigiMax's rear panel provides eight mic inputs on Neutrik combo connectors and eight balanced ¼-inch TRS analog outputs (see **Fig. 2**). The rear panel is also where the 48V phantom-power switches are—inconveniently—located.

The DigiMax provides digital output through an ADAT Lightpipe port (which carries eight channels) and a 9-pin connector that outputs signals in AES/EBU or S/PDIF formats. Accessing the S/PDIF or AES/EBU output requires, respectively, the DM006 or the DM007 9-pin breakout cable ($39.95) available from PreSonus. Either cable provides four stereo connectors for a total of eight channels (see **Fig. 3**). The DigiMax is preconfigured for AES/EBU output, but you can switch it to S/PDIF by resetting jumpers inside the unit.

PRODUCT SUMMARY

PreSonus
DigiMax
mic preamp and A/D converter
$1,699.95

FEATURES	4.0
EASE OF USE	4.0
AUDIO QUALITY	4.0
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: Eight channels of excellent-sounding Class A preamps. 48V phantom power and 20 dB attenuation pads on each channel. Polarity-reverse switches and unbalanced ¼-inch instrument inputs on first two channels. Flexible analog I/O and digital output with 24 simultaneously active outputs. Supports 24-bit audio at 32, 44.1, and 48 kHz. Offers word-clock I/O.

CONS: Limiter feature squashes audio too easily. EQ Enhance feature carves out midrange too drastically. Phantom-power switches inconveniently located on rear panel. Does not support 88.2 or 96 kHz audio.

Manufacturer
PreSonus
tel. (225) 216-7887
e-mail presonus@presonus.com
Web www.presonus.com

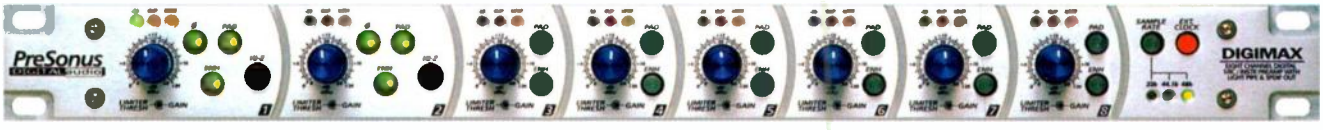
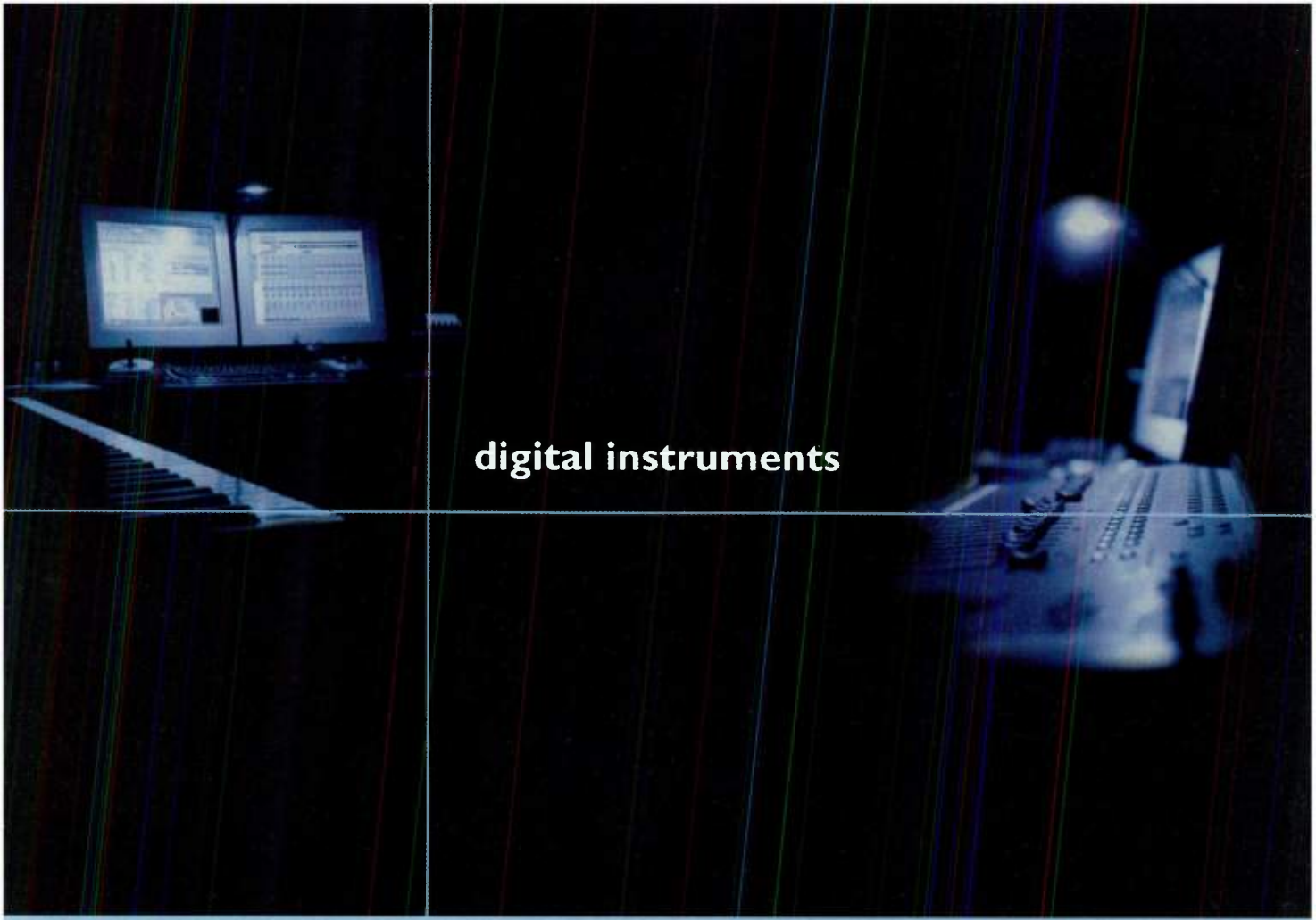


FIG. 1: A one-stop solution for DAW recordists, the PreSonus DigiMax provides eight channels of Class A mic preamplification; two DI inputs; 20 dB pads, 48V phantom power, peak limiters, and an EQ Enhance feature on every channel; quality A/D conversion; and as many as 24 simultaneously available outputs (8 analog, 16 digital).



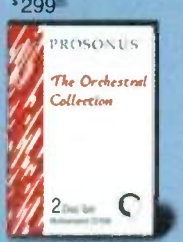
Choose an instrument that makes you **sound** good.

...one that has been **recorded** and **designed** to capture every characteristic and nuance, delivering its very essence to your finger tips.

$399

$199

$299

$299


bigfish audio™

digital instrument division

bigfishaudio.com • 800.7[WRH]7.3474 • 818.768.6115

Digital output can operate at 32, 44.1, or 48 kHz sampling rates. Bit depth is fixed at 24 bits. No dithering of the output is provided (despite the manual's assertion that it is—a misprint, according to PreSonus), so connecting the DigiMax to a 16-bit device results in a simple truncation of the last eight bits of data. Word-clock I/O is provided, and the DigiMax can automatically sync to incoming word clock or a digital-input signal through its BNC connectors, which are also on the rear panel.

A cool DigiMax feature is its ability, when fitted with a breakout cable, to simultaneously output 24 channels: 8 analog and 16 digital. That solves the latency problem inherent in DAW recording by letting you monitor directly from the DigiMax's analog outputs, thus avoiding any signal delay, while the digital outputs feed the DAW. That feature alone could put the DigiMax at the top of the list for anyone who records real instruments (as opposed to those who work only with MIDI sound sources).

The simultaneous analog and digital outputs also make the DigiMax great for live recording. For example, you could use the ADAT Lightpipe to feed an MDM's digital input while sending an identical signal to the front-of-house mixer using the DigiMax's TRS analog outputs.

The DigiMax has an external power supply, which clearly helps account for the unit's impressively low noise specification. However, it's not your typical wall-wart or line-lump power converter. Rather, it is a heavy-duty ½-rackspace unit that can be rackmounted using the optional PSRA rack adapter ($29.95), which can hold three DigiMax power supplies.

MAIN COURSE

Often you can't tell if a device's sonic signature is desirable until it accumulates on several tracks. For instance, if you record 20 or 30 audio tracks through a lame signal path, the cumulative result becomes quite noticeable. The same is true for recording through a great signal path, except that the cumulative result is good rather than

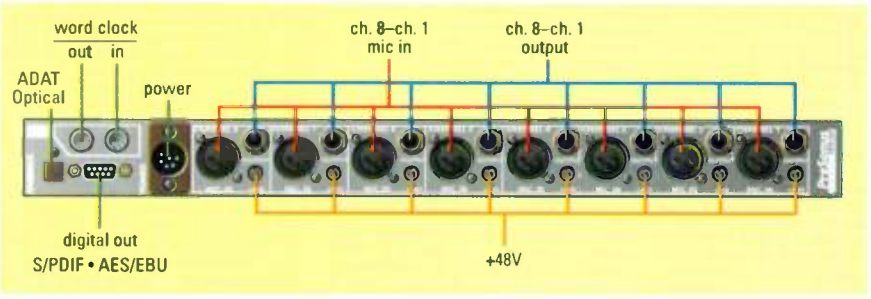


FIG. 2: The DigiMax's rear panel provides eight mic inputs on Neutrik combo connectors, eight ¼-inch TRS analog outs, an ADAT Lightpipe port, and a 9-pin connector that can output AES/EBU or S/PDIF (internally switchable) when fitted with an optional breakout cable. Word-clock synchronization is available on BNC connectors.

bad. It all adds up, whether for you or against you.

The preamps in the DigiMax sound good and full over a broad frequency range. They also have little inherent noise, because of their capacitorless design.

My studiomates and I recorded with the DigiMax for a couple of months while working on a variety of projects for Hal Leonard Publishing, Carnival Cruise Lines, and several theater shows. We set up two rooms, one with my normal tracking rack and the other with the DigiMax. (My tracking rack consists of two channels of Neve 1272 preamps, two Empirical Labs Distressors, and a stereo Nightpro EQ3-D.)

Although we often move my tracking rig from room to room when recording critical tracks, it stayed put during the period in which I evaluated the DigiMax. If we needed to cut vocals or do MIDI transfers in the room with the

DigiMax Specifications

Audio Channels	8
Analog Inputs	(8) balanced XLR/TRS Neutrik combo (mic); (2) unbalanced ¼" (instrument)
Analog Outputs	(8) balanced TRS
Digital Outputs	(1) ADAT optical (8 channels); (1) 9-pin (8 channels), selectable AES/EBU or S/PDIF (optional breakout cable required); (1) BNC word clock
Synchronization	(2) BNC word clock (input and output)
Frequency Response	20 Hz–50 kHz
Total Harmonic Distortion + Noise	<0.009%
Noise Floor	–94 dBu
Signal-to-Noise Ratio	>98 dB
Analog Dynamic Range	>120 dB
Headroom	+24 dBu
Maximum Gain	+50 dBu
Attenuation Pad	20 dB
LED Meters	(1) signal present (–20 dBu); (1) clip (+22 dBu); (1) limiter active
Phantom Power	+48V (individually switchable on back panel)
Polarity Reverse	chs. 1–2
Sampling Rates	32, 44.1, and 48 kHz (selectable)
Bit Depth	24-bit (fixed)
Power Supply	external, ½-rackspace (rackmountable)
Dimensions	1U × 7" (D)
Weight	15 lb.

Original sample libraries.
SOUNDSCAN™
Only $49.95 each.
50 titles...
audio • akai • WAV • aiff
The World's largest sample collection
vol. 1 Hard & Loud Techno
vol. 2 Hip Hop Underground
vol. 3 Pure Electro
vol. 4 Ac. & Electric Guitar Loops
vol. 5 Explosive Jungle
vol. 6 Electric & Acoustic Bass
vol. 7 Crazy Processed Drumloops
vol. 8 Jazz & Latin Drumloops
vol. 9 Old School Keyboards
vol. 10 Acoustic Drums
vol. 11 Dance & Groove Drums
vol. 12 Analog & Synth Bass
vol. 13 Ethereal Atmospheres
vol. 14 Twisted Special FX
vol. 15 Acoustic Percussions
vol. 16 Bossa Brazil
vol. 17 Acoustic Keyboards
vol. 18 Funky Vocals
vol. 19 Hip Hop • R'n B
vol. 20 Fresh Disco House Vol. 1
vol. 21 Fresh Disco House Vol. 2
vol. 22 Vintage Guitars
vol. 23 Historical Instruments
vol. 24 Industrial Loops
vol. 25 Big Beat Vol. drumloops
vol. 26 Big Beat Vol.2 : samples & more
vol. 27 Reggae Ragga Dub
vol. 28 Acoustic & Synth Choirs
vol. 29 Killer Brass Riffs
vol. 30 Electric Bass Grooves
vol. 31 Miro's experimental Grooves
vol. 32 Roots Disco
vol. 33 Disjonted Textures
vol. 34 Burning Grunge Hip Hop
vol. 35 The Dark Side of Trip Hop
vol. 36 Percussion Loops
vol. 37 Pop/Rock Drumloops
vol. 38 Funk & Groove Drumloops
vol. 39 Brushed Drumloops
vol. 40 Complete Accordions
vol. 41 Roots Funk
vol. 42 Celtic Flavours
vol. 43 Arabian Traditions
vol. 44 African Traditions
vol. 45 Indian Traditions
vol. 46 70's Breakbeats
vol. 47 Hip Hop • R'n B #2
vol. 48 Ominous Drones
vol. 49 Analog Fantasies
vol. 50 Electric & Acoustic Guitars
bigfish audio™
Professional sound libraries.
bigfishaudio.com
800.717.3474
818.768.6115

Bayview Pro Audio

We will beat any advertised price from any dealer!
Bayview Pro Audio Inc - US Distributor for SE Electronics
Classic performance reborn at a fraction of the cost.

se.electronics

Sale $299.00

SE5000Tube Microphone
Type: vacuum tube condenser
Frequency Response: 20Hz to 18kHz
Polar Pattern: cardioid
Sensitivity: >16m V/Pa
Output Impedance: <200 ohm
Output Noise: <18dB typical, A weighted
THD: <0.5% at 120 dB SPL
Power: external regulated 115/220 P.S

SE1
Sale $89.00
Type: small diaphragm condenser
Frequency Response: 30Hz to 18kHz
Polar Pattern: cardioid
Sensitivity: 10mV/Pa
Output Impedance: <200 ohm
Output Noise: <18dB typical, A weighted
THD: <0.5% at 134 dB SPL
Power: +48V phantom power

SE1000
Sale $99.00
Type: large diaphragm condenser
Frequency Response: 30Hz to 20kHz
Polar Pattern: cardioid
Sensitivity: >18m V/Pa
Output Impedance: <200 ohm
Output Noise: <17dB typical, A weighted
THD: <0.5% at 120 dB SPL
Power: +48V phantom power

SE2000
Sale $129.00
Type: large diaphragm condenser
-10db Pad - lo-cut filter
Frequency Response: 30Hz to 20kHz
Polar Pattern: cardioid
Sensitivity: >18m V/Pa
Output Impedance: <200 ohm
Output Noise: <17dB typical, A weighted
THD: <0.5% at 120 dB SPL
Power: +48V phantom power

SE2500
Sale $149.00
Type: large diaphragm condenser
Frequency Response: 30Hz to 18kHz
Polar Pattern: cardioid
Sensitivity: >16m V/Pa
Output Impedance: <200 ohm
Output Noise: <17dB typical, A weighted
THD: <0.5% at 120 dB SPL
Power: +48V phantom power

SE3000
Sale $179.00
Type: 1.07" twin diaphragm condenser
Frequency Response: 20Hz to 20kHz
Polar Pattern: cardioid, figure 8, omni
Sensitivity: >18m V/Pa
Output Impedance: <200 ohm
Output Noise: <17dB typical, A weighted
THD: <0.5% at 120 dB SPL
Power: +48V phantom power

SE3500
Sale $169.00
Type: 1.07" large diaphragm condenser
Frequ1ency Response: 20Hz to 20kHz
Polar Pattern: cardioid
Sensitivity: >20m V/Pa
Output Impedance: <200 ohm
Output Noise: <15dB typical, A weighted
THD: <0.5% at 120 dB SPL
Power: +48V phantom power

Bayview Pro Audio Line Card

BPA DAW System II

888.718.0300
www.bayviewproaudio.com
We build custom Daw Systems

FIG. 3: The optional breakout cable attaches to the 9-pin connector on the back of the DigiMax to provide four stereo pairs (eight channels) of AES/EBU digital output. A similar cable for S/PDIF output is also available.

DigiMax, we did so without hesitation. The DigiMax worked great as a digital A/D front end for MIDI transfers into the computer, and it also provided quality preamps for vocal and other critical recording.

That is not to say that the DigiMax sounded as good as my tracking rack; after all, one channel in my rig costs about $3,000, as opposed to $212 per channel for the DigiMax (not to mention that the DigiMax includes A/D converters). It was a testament to the merits of the PreSonus preamps that we trusted them enough to use them on real-world projects in which quality was essential. Playing with a unit for the purposes of writing a review is one thing, but actually using the unit on professional projects is something else entirely. Thankfully, the DigiMax preamps passed with flying colors.

SIDE DISHES

The bonus features on the DigiMax were less to my liking. For example, the Dual Domain limiter's threshold, which is controlled by the outer dial of a dual-concentric pot (the inner pot controls the channel's gain), was difficult to set properly because there is not much of a sweet-spot range to work with. Up to a point, the limiter sounded as though it wasn't doing much at all; then suddenly, when I turned the knob only slightly more, it squashed the signal in an unpleasant way.

According to PreSonus, the limiter has two thresholds with a 6 dB difference between them. You get only light compression at lower threshold settings. When the signal hits the second threshold, the harsher peak limiting sets in. Because the threshold is interactive with the gain amount, some experimentation is necessary to find the proper settings for the desired effect. However, I never achieved a sound that I liked with the limiter; after a few days, I simply stopped using it and was quite happy thereafter.

I stopped using the EQ Enhance feature, too, because engaging it on a channel carves out a 3 dB hole from 250 Hz to 5 kHz, effectively gutting the frequencies in which most of the music lies. I did not find a single instrument, live or MIDI, that sounded better with the EQ Enhance button engaged. For that reason, I think a tamer midrange dip—say, a 1.5 dB cut at 630 Hz with a much narrower bandwidth—would better serve the DigiMax. Perhaps PreSonus could use the slot to install a highpass filter, an airband boost, or a channel mute.

LOTS TO OFFER

The PreSonus DigiMax is an affordable, versatile unit that excels at its core duties: mic and instrument amplification and A/D conversion. Its Class A preamps sound great, and the simultaneously available analog and digital outputs provide an elegant solution for the vexing problem of signal latency, making the unit an excellent choice as a front end for digital recorders and DAWs. The unit is ideal for live recording, too, and it can function as a 2-channel DI box.

The DigiMax's limiter and EQ enhancer circuit are of limited use. The unit does not support 88.2 or 96 kHz audio, which may limit its appeal for forward-looking digital recordists. Still, the DigiMax occupies its own audio niche, providing useful capabilities that no other single box offers. If you're looking for an 8-channel preamp with digital outputs to use as an A/D path for a DAW or digital recorder, the DigiMax has you covered. ●

Loops

bigfishaudio.com

bigfishaudio™
Professional sound libraries.
800.717.3474
818.768.6115

STARR LABS

ZTAR Z1 AND Z1-S

Is the ultimate MIDI controller a guitar?

By Bobby BeauSoleil

Although guitar-to-MIDI converters have improved since being introduced in the early '80s, they are still inherently finicky and unpredictable, and the range of MIDI control data they can generate is often limited. At best, conventional guitar controllers represent a set of workarounds that many electronic musicians, especially guitar players, find less than satisfying. The Starr Labs Ztar represents a giant step forward in the quest for sophisticated real-time MIDI controllers, helping to bring electronic music with subtlety and nuance within reach.

BOBBY BEAUSOLEIL

FIG. 1: The Starr Labs Ztar Z1 and Z1-S MIDI controllers offer similar features and options, but each has a different combination of trigger switches.

The Ztar's design bears some similarity to the SynthAxe, a guitarlike MIDI controller. Despite a few reported reliability problems, the SynthAxe offered a superior method for translating guitar technique into MIDI control streams. The Ztar incorporates many advances in sensor and large-scale integration technologies that developed in the intervening years. Starr's controller offers dependability, advanced MIDI implementation, and more control options, all for about one quarter of the SynthAxe's original price.

Since entering the market in 1991 (see the Ztar 624-D review in the November 1994 **EM**), the Ztar has continued to evolve. Starr Labs refined the instrument's design by improving materials and mechanisms, frequently updating the firmware, and adding new features and controller options. The two models' gesture-input functions have a few significant differences (see **Fig. 1**).

PARADIGM SHIFT

From a construction standpoint, the Ztar has little in common with traditional guitars. It doesn't even have strings, in the conventional sense. Its radical design is the root of its success as a MIDI controller.

The Ztar exhibits none of the quirks that have long plagued guitar controllers, such as tracking delays, pitch flutter, false notes, and erratic triggering. Instead of translating string vibrations into MIDI data, the Ztar employs an array of specially designed potentiometers, switches, and sensors, providing a far more direct connection between the player's input and its conversion to MIDI data. Starr's controllers respond to touch with an almost startling immediacy. They translate a variety of gestures into a comprehensive and flexible stream of MIDI control data with predictable precision.

The Ztar is neither a guitar nor a replacement for one. If you approach the device expecting to play it in exactly the same fashion you would a guitar, you probably will be disappointed. On the other hand, if you approach the Ztar with some understanding of the concepts behind its design and of its strengths and weaknesses, you will be rewarded with extraordinary creative and expressive possibilities.

Essentially, the Ztar is a sophisticated keyboard remodeled to mimic a guitar's shape and much of its playability. Its controls let guitar fingerings initiate notes, and they provide techniques for articulation and modulation, including finger pressure, breath, and foot control. In addition, the Z1 has a bank of Velocity- and Pressure-sensitive trigger pads, and the Z1-S has string triggers to facilitate picking techniques.

You can program the Ztar's controls to perform more than one task and to transmit corresponding MIDI messages on several channels simultaneously. The instrument supports user-programmable transposition, alternate tunings, and multiple splits and layering.

Aside from guitarists and bassists, percussionists who want to step out from behind the kit should try the Z1. The Ztar might also be attractive to remixers, sound designers, Foley artists, or anyone who can benefit from a controller with such advanced MIDI implementation.

OUTSIDE THE BOX

The Ztar arrives in a well-padded, plush-lined canvas gig bag. An accessory pouch contains a pair of MIDI cables, a wall-wart AC adapter, a 32-page manual, and a black metal junction box for routing MIDI signals and supplying power to the Ztar. A flexible 30-inch plastic tube with a mouthpiece for the optional Breath Controller ($130) input was included with the unit supplied for review.

Like an electric guitar, the Ztar is composed of a body and a neck-and-fingerboard assembly. The neck fits snugly into a notch on the upper body and is fastened with three bolts, forming a solid and ergonomically functional neck-to-body joint.

The housings for the body and neck

GO DIGITAL WITH THE

Electronic Musician

DIGITAL Home Keyboard Guide™

The Complete Guide to Digital Pianos and Home Keyboards!

Electronic Musician's annual buyers guide now includes the exciting home keyboard market! The exclusive guide to digital pianos graduated to a comprehensive home keyboard resource with the 2001 issue.

Arm yourself with these exciting, educational features and essential buying data before you purchase your next keyboard or piano!

- 2002 Digital Pianos
- Piano Lessons
- Today's Amazing Acoustic Pianos
- The Computer Connection
- 2002 Portable Home Keyboards
- MIDI for Beginners

The *Digital Home Keyboard Guide 2002* is available at participating piano and organ dealers, and wherever *Electronic Musician*® is sold.

assemblies are castings of a black resin compound. The body has an attractive, finely pebbled matte finish, and the neck's glossy veneer facilitates easy sliding of the hand against the neck's back and sides. Replacing the wood used in earlier Ztar designs with the cast resin material makes the units less likely to contract and expand with atmospheric changes. A tendency to flex or warp would have compromised the tolerance of the tiny touch-sensitive components, resulting in erratic performance.

Designing a stringless, touch-sensitive instrument that feels good and works well is a challenge for anyone, and Starr Labs' design succeeds. After many years of playing guitars with real strings, I found the Ztar's virtual strings to be a bit of a struggle at first. Within a surprisingly short time, though, I was comfortable playing chords and scales and generally riffing around on the Ztar's fingerboard.

BOARD GAMES

The fingerboard features a 24-by-6 matrix of tiny oblong buttons—the equivalent of the fret positions on a guitar's fingerboard (see **Fig. 2**). The surface of each 3/32-inch-by-3/4-inch Velocity- and Pressure-sensitive button is smoothly rounded. Buttons are black or white, are arranged in a pattern imitating guitar fingerboard positions, and are activated by a light touch. Dot-inlay position markers are on the side of the neck.

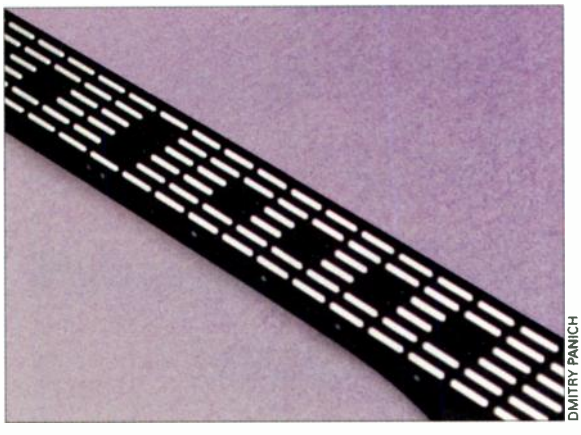
When playing a Ztar for the first time, those accustomed to guitar fingerboard spacing should expect a brief adjustment period; the semitone intervals are spaced an equal distance apart. Instead of tapering in the manner of a guitar neck, the Ztar's neck is 2 3/16 inches wide along its 22-inch length.

The Ztar's fingerboard supports Polyphonic Aftertouch, which provides dynamic expression of notes (assuming your synth supports it) in response to finger pressure applied to keys. The Zone/EFX submenu lets you adjust the threshold and sensitivity of the Pressure response. You can also defeat the fingerboard's Velocity sensitivity, leaving the picking hand to perform dynamic expression with the triggers on the body.

The optional Pressure-sensitive Neck Strip Sensor ($95) is well worth the extra cost. It is affixed to the side of the neck nearest the player's view, partly obscuring the dot-inlay position markers and extending the length of the neck. Controlled with the thumb of the fingerboard hand, the Neck Strip Sensor can transmit Channel Pressure, Pitch Bend, Expression, Sustain Pedal, and other MIDI continuous controller messages.

BODY IMAGE

The Ztar body assembly is molded into a wedgelike trapezoidal shape that is gently rounded at the bottom, is symmetrically sloped at the sides, and terminates in the contoured point at which it joins the neck. With a depth of 2¾ inches, the body is about half as thick as that of an average solid-body electric guitar. The slope of the side panel on the body's opposing side gives the instrument a tendency to slide off your knee unless you hold it at a slightly awkward angle. The shape is less than ideal for playing the controller while seated, but Starr offers an optional knee rest ($35) to remedy the problem. Fortunately, the instrument balances perfectly when used with a guitar strap.



DMITRY PANICH

FIG. 2: Unlike playing conventional strings and frets, playing the Ztar's fingerboard can trigger MIDI events and send Channel Voice messages when you apply pressure to the buttons.

PRODUCT SUMMARY

Starr Labs
Ztar Z1 MIDI controller
$1,995
Z1-S MIDI controller
$2,195

FEATURES	4.5
EASE OF USE	3.0
DOCUMENTATION	2.0
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: Well designed. Durably constructed. Comprehensive and flexible MIDI implementation. Sensors are responsive to the touch. Translates most traditional guitar-playing techniques. Can be customized by programming to accommodate unique playing styles.

CONS: Poor documentation. Cannot translate stringed-instrument note-bending techniques. No legends for input and output connections on instrument body. Cumbersome pedal-connection scheme.

Manufacturer
Starr Labs
tel. (619) 233-6715
e-mail harvey@cts.com
Web http://catalog.com/starrlab

The 80-character backlit display is positioned in plain view on the sloping side of the body (see **Fig. 3**). The display and its surrounding soft buttons offer access to configuration presets, tunings, controller assignments, operation modes, MIDI status, and so forth.

Most physical controllers are on the top of the body. Each of the six virtual strings connects to a dedicated trigger mechanism on the Ztar's body and operates independently of the others. When you activate a trigger, it samples its corresponding virtual string to determine the correct pitch and transmits the appropriate MIDI control data. In other words, select notes with the fretting hand and trigger them with the picking hand, as you would on a guitar.

The six triggers are just below the fingerboard and aligned on the same axis. Their location and orientation on the Ztar's body will seem familiar to guitar and bass players immediately.

Alternative operation modes let you play the fingerboard with both hands by disengaging the triggers from their relationship with the fingerboard.

The Z1's six triggers are elongated membrane-type keypads in a raised-relief pattern to provide tactile feedback. They are Velocity- and Pressure-sensitive and respond equally well to tapping and strumming techniques. Below the triggers are 12 rectangular button-type pads in two columns extending down the center of the body; they also respond to Velocity and Aftertouch. The pads can send controller messages on as many as eight MIDI channels at the same time.

In place of the Z1's keypad triggers, the Z1-S provides six short metal strings stretched between the pickup bridge (just below the fingerboard) and the metal termination bridge (at the bottom of the body). Those strings respond with excellent Velocity sensitivity. For notes triggered from the strings, you can mute them in a natural manner by touching the string with a finger or by touching the metal bridge with the heel of your hand, both of which send Note Off commands. Muting is independent for each string. That makes the Z1-S a good choice for traditional flatpicking, fingerpicking, and strumming techniques.

DMITRY PANICH

FIG. 3: The Ztar's backlit display and an array of soft buttons are accessible and easily visible from the sloping side of the guitar.

It's difficult to implement Pressure sensitivity in a triggering system of that type, which gives the Z1 model an edge. The Z1-S forgoes the Z1's pads to make room for its larger string-trigger assembly. However, an optional over-bridge assembly ($340) offers six pads mounted above the string triggers.

In all other respects, the features of the Z1 and Z1-S are the same. On the surface closest to the player's point of view is a row of ten membrane switches

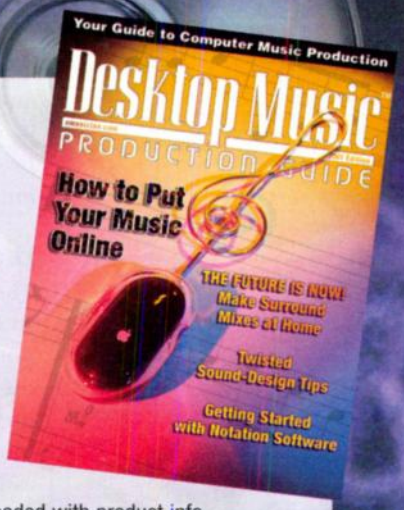
Desktop Music™
PRODUCTION GUIDE

Don't Get Left in the Digital Dust!

Electronic Musician's
2002 Desktop Music Production Guide
is the authoritative resource for the desktop revolution!
Featuring four easy-to-follow sections:
• Start Up • Internet • Hands On • Overdrive
The DMPG targets a wide range of topics for computer musicians, and is loaded with product info and new technology applications and ideas for desktop musicians.

Available in December 2001!

Get your copy wherever *Electronic Musician* is sold, or call (800) 441-0294
or (913) 967-1707(outside the U.S.) to place your order today!



serving as function keys. (I normally prefer buttons to membrane switches, but because membrane switches require a more deliberate touch, they help prevent the player from accidentally switching modes.) From left to right, the switches offer Octave Up, Octave Down, Patch Up, Patch Down, Triggers, Guitar/Poly, Solo, Write, Record, and Panic. Switches that perform toggle functions are equipped with small LEDs to indicate their status.

Opposite the function keys and just beyond the triggers are a rotary knob and a joystick. The knob is fully programmable and assignable to MIDI commands suited to rotary control. Likewise, the spring-loaded joystick offers four general-purpose controllers and an additional button feature. Each joystick quadrant (up, down, left, and right) is individually programmable, and pressing inward on the joystick activates a momentary switch that can initiate a CC. Think of the joystick as a sort of super whammy bar for generating out-of-this-world modulation effects (see **Fig. 4**).

A metal jack plate on the body's lower end sports a rocker power switch, MIDI In and Out ports, a ¼-inch sustain-pedal input, and a ¼-inch volume-pedal input. You can assign the pedal inputs to a variety of MIDI functions. One of the units came fitted with a special connector for the freely assignable Breath Controller's plastic tube. Surprisingly, the jack plate has no legend, so you will need to consult the manual or employ trial and error to determine each jack's purpose. That is an unnecessary annoyance rather than a serious problem.

DMITRY PANICH

FIG. 4: The Ztar's joystick offers two modulation assignments for each axis. Depressing the joystick provides one additional controller.

The sturdy PB-1 junction box connects to the Ztar by means of a standard MIDI cable. The supplied AC adapter connects to a jack on one end of the box, and an LED on the other end indicates when it receives power. A cable from the Ztar's MIDI Out connects to the Controller input on the junction box, and a second MIDI cable connects between the PB-1's MIDI Out and the sound source's MIDI In. That is a less-than-elegant solution to the problem of supplying power to a remote, strap-on controller.

DIGITAL DEXTERITY

The Ztar is always in Live or Edit mode. In Live mode, the front-panel Record button lets you assign notes to sensors on the fly. First, play the desired notes on the fingerboard; press Record; then, touch the sensor to which you want to assign the notes. Recording even copies to the sensor the fingerboard's MIDI channel assignments for the selected notes. A Chord Hold function operates in a toggle fashion in which the triggered notes sustain until the sensor is touched again; otherwise, you can sustain notes and retrigger them with a subsequent touch.

Interestingly, notes that sound from unfretted triggers are tuned independently of the fingerboard zones—a feature with some remarkable creative potential. Although you can set notes triggered on the fingerboard to standard tuning, you can program the open "strings" for alternate tunings. Furthermore, you can use the open-note tunings as an electronic capo. That feature, in combination with hammer-on techniques, is almost like having an extra digit, allowing for complex fingerings.

The Triggers and Scan parameters determine some of the Ztar's most essential operating modes. The possible settings are Triggers: On/Off and Scan: Guitar/Polyphonic, with each combination resulting in a unique operation mode. Dedicated front-panel function buttons labeled Trig and G/Poly let the player switch between operating modes in Live mode.

When the Triggers parameter is toggled to off, the triggers and fingerboard operate independently of one another. You can play the fingerboard with both hands or play it with one hand while manipulating the sensors on the body with the other. With the Scan parameter switched to Polyphonic mode, you can play as many notes on the fingerboard as your fingers can handle, even if the notes are on the same virtual string.

With Guitar mode activated and the triggers turned on, the Ztar behaves like a traditional guitar: notes selected on the fingerboard are transmitted only when the corresponding triggers are

UNITED STATES POSTAL SERVICE STATEMENT OF OWNERSHIP, MANAGEMENT, and CIRCULATION
(required by 39 U.S.C. 3685)

Publication Title: *Electronic Musician*
Publication No.: 493-290
Filing Date: 09/07/01
Issue Frequency: Monthly
No. of Issues Published Annually: 12
Annual Subscription Price: $36.00
Address of Known Office of Publication: Primedia Business Magazines & Media, 6400 Hollis Street #12, Emeryville, CA 94608-1052
Address of Headquarters or General Office of Publisher: Primedia Business Magazines & Media, 6400 Hollis Street #12, Emeryville, CA 94608-1052
PUBLISHER: John Pledger (same address)
EDITOR: Steve Oppenheimer (same address)
MANAGING EDITOR: Patricia Hammond (same address)
OWNER: PRIMEDIA Inc., 745 Fifth Avenue, New York, NY 10151 USA
Known Bondholders, Mortgagees, and Other Security Holders: None
Publication Title: *Electronic Musician*
Issue Date for Circulation Data: October 2001

EXTENT AND NATURE OF CIRCULATION

	Average No. of Copies Each Issue During Preceding 12 Months	Actual No. of Copies Single Issue Published Nearest to Filing Date
Total No. Copies (Net Press Run)	93,850	91,835
Paid/Requested Outside-County Mail Subscriptions Stated on Form 3541	54,873	52,066
Paid In-County Subscriptions Stated on Form 3541	0	0
Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Non-USPS Paid Distribution	21,003	22,613
Other Classes Mailed Through the USPS	0	0
Total Paid and/or Requested Circulation	75,877	74,679
Free Distribution by Mail (Samples, Complimentary, and Other Free)		
Outside County as Stated on Form 3541	1,584	1,558
In-County as Stated on Form 3541	0	0
Other Classes Mailed Through the USPS	0	0
Free Distribution Outside the Mail	1,754	2,800
Total Free Distribution	3,338	4,358
Total Distribution	79,215	79,037
Copies Not Distributed	14,636	12,798
Total	93,850	91,835
Percent Paid and/or Requested Circulation	95.79%	94.49%

I certify that all information furnished on this form is true and complete
John Pledger, Publisher

activated with the other hand. If you turn the triggers off while the Ztar is in Guitar mode, you can trigger notes again directly from the fingerboard, but the highest-note priority is maintained. When you select Guitar mode from within the Scan-Mode submenu, additional parameters enable or defeat hammer-on articulations and allow adjustment of hammer-on threshold sensitivity.

If you turn the triggers off in Guitar mode, you can play notes and chords on the fingerboard with one hand. That leaves the other hand free to move the joystick or manipulate other sensors on the instrument's body. Guitar mode also lets you use both hands for tapping on the fingerboard.

The Ztar shines the most in Polyphonic mode with the triggers on the body turned off. You can use both hands to play chords with intervals that would require two keyboard players to perform. Using that technique with alternate tunings can extend the Ztar's range of chording possibilities considerably.

The Ztar does not possess a guitar's facilities for creating pitch bends and vibrato by manipulating strings on a fretboard. The finger-pressure response of the Z1's key triggers is well suited to LFO modulation, so I often employ that setup for vibrato. Generally, I use the Neck Strip Sensor for bending notes, manipulating it with the thumb of my fingerboard hand; alternatively, I use the Breath Controller for supple control of Pitch Bend. For whammy-bar effects, I assign Bend Down and Bend Up to opposing joystick quadrants. You can do some wicked dive-bombing with such a setup, bending notes and chords over any range your synth will allow. With a multitimbral instrument, that technique can produce utterly awe-inspiring sounds.

PICKS AND PANS

It's difficult to gripe much about the Ztar. Except for its inability to translate typical stringed-instrument pitch-bending techniques, the Ztar succeeds in almost every respect.

My main criticisms concern the I/O connection scheme. I just can't abide three cables hanging from the end of the Ztar's body. A more elegant solution would provide a floor unit that connects to the Ztar with control pedals already mounted and with a single cable and a built-in power supply (thus eliminating the wall wart). It would also be helpful if the floor unit were equipped with an array of footswitches for sending multichannel Program Changes; that would free the performance sensors from relatively mundane tasks.

Easily, the package's weakest element is the documentation. The loop-bound manual consists of a somewhat loose collection of entries covering various Ztar models, including some that are no longer in production, and the information is not indexed. According to Starr Labs, a new manual is in the works. Meanwhile, you can find a wealth of useful information and novel ideas for Ztar applications at http://groups.yahoo.com/group/ztar. Harvey Starr occasionally haunts the site to answer questions, offer suggestions, and gather ideas for design improvements.

A few minor complaints notwithstanding, the Z1 and Z1-S models are well conceived, solidly built, and extremely versatile. The Ztar's MIDI implementation is unrivaled by any other MIDI controller. Much of the instrument's beauty is its high degree of customization. In fact, it's improbable that any two Ztar players will ever sound the same.

Paired with synths that offer enough modulation routings to do it justice, the Starr Labs Ztar can provide real-time musical-performance capabilities of tremendous depth and power. If you're the adventurous type and your leanings are toward electronic music's frontiers, see what a Ztar can do for you.

Bobby BeauSoleil *is an electronic musician and sound designer who has composed for film and video. You can hear examples of his music, including Ztar performances, at www.whitedogmusic.com.*

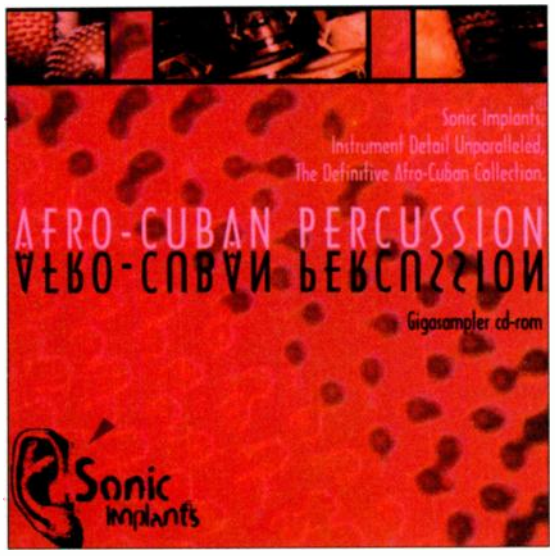
Quick Picks

SONIC IMPLANTS

Afro-Cuban Percussion (GigaSampler)

By Zack Price

Joe Galeota is the owner of JAG Drums (seller of handcrafted African percussion instruments) and plays all the instruments for Sonic Implants' *Afro-Cuban Percussion* ($99.95) sample CD-ROM. The collection features a variety of percussion instrument samples for NemeSys's line of *GigaStudio* software samplers. Producer Dave Quattrini recorded Galeota at multiple velocity levels for realistic tone when playing softer and louder notes. Furthermore, Quattrini recorded the instruments using close- and ambient-miking on two DAT decks. According to Quattrini, the ambient microphone was set up about three feet away from the source. Even though that is a relatively short distance for ambient-miking, it is enough to guarantee a full yet more natural instrument sound. Using both recording techniques on all the instruments ensured a consistency in sound. Additionally, you can easily mix and match ambient- and close-miked sounds.



Sonic Implants' *Afro-Cuban Percussion* sample CD-ROM in the GigaSampler format places a variety of percussion instruments at your fingertips.

Bells and Whistles

The sounds in the library are divided into three groups: Bells, Shakers, and Scrapers; Hand Drums; and Stick Drums. The sounds in those groups are further subdivided into ambient- and close-miked categories. In *GigaStudio*, copy the folders on the CD-ROM to the drive in which you store your GigaSampler files. Create a new folder on that drive and name it Afro-Cuban Percussion. The CD-ROM samples are neatly organized into folders and subfolders, which makes them easy to find anytime you reopen *GigaStudio* to update the library.

Inside the Bells, Shakers, and Scrapers group are the following instrument sounds, arranged in single-instrument *GigaStudio* patches: Afoxe, Agogo, Ankle Bells, Caxixi, Cha Cha Bell, Claves, Cowbells (low, mid, and high), Frogs Eggs, Guiro (Cuban and merengue), Large Basket, Maracas, Reco Reco, Samba Whistles, and Sencero. The Hand Drums collection contains Birimbou, Bongo, Conga, Conga Quinto, Conga Segundo, Conga Tumbadora, Cuica, Finger Snaps, Pandeiro, and Vibraslap. The Stick Drums set offers Jam Blocks, Repenique, Surdu Bombo (played with felt-covered and bare-wood sticks), Surdu Cortador, Surdu Macana, Tamborim, Timbales, and Timbalitos.

Percussion Ensemble

In each case, all of the variations of an individual instrument are mapped out across a group of keys. For example, Bongo contains low bongo hits (muted and open), low slaps, high bongo hits (muted and open), and high slaps. Unfortunately, the CD-ROM contains no documentation regarding the mapping of each individual sound. That means the user has to discover by trial and error which note triggers a percussion sound, which is not the preferred modus operandi in a studio situation in which time is money. Keymap documentation would also help in setting up a MIDI percussion controller. Nonetheless, the sounds are mapped in such a way that the user often can perform realistic instrument phrases by playing the keys scalewise in three- or four-note groups.

Inasmuch as each of the instruments are separate GigaSampler files, the user has to load each instrument into a separate MIDI channel. That is a good thing because it provides the greatest amount of control possible for each instrument. The larger the percussion section you create, the fewer MIDI channels you have for other instruments—that shouldn't be a problem in *GigaStudio 96* or *GigaStudio 160*, which have 32 and 64 MIDI channels, respectively. *GigaSampler LE* and *GigaSampler 64* are limited to 16 MIDI channels, so users of those programs may need to conserve resources when creating a large percussion section.

Authentic Sounds

As for the lack of documentation, Quattrini says that keymapping information should be available on Sonic Implants' Web site by the time you read this. A few Performance patches with more common Afro-Cuban percussion ensemble groupings would be nice too.

Overall, the sound quality is excellent, and playing the sounds is relatively easy despite the lack of mapping info. Although I appreciate the inclusion of close- and ambient-miked recordings, I gravitate toward the ambient sounds. Whichever you prefer, the *Afro-Cuban Percussion* library is a worthy addition to your GigaSampler instrument collection.

Overall EM Rating (1 through 5): 4.5

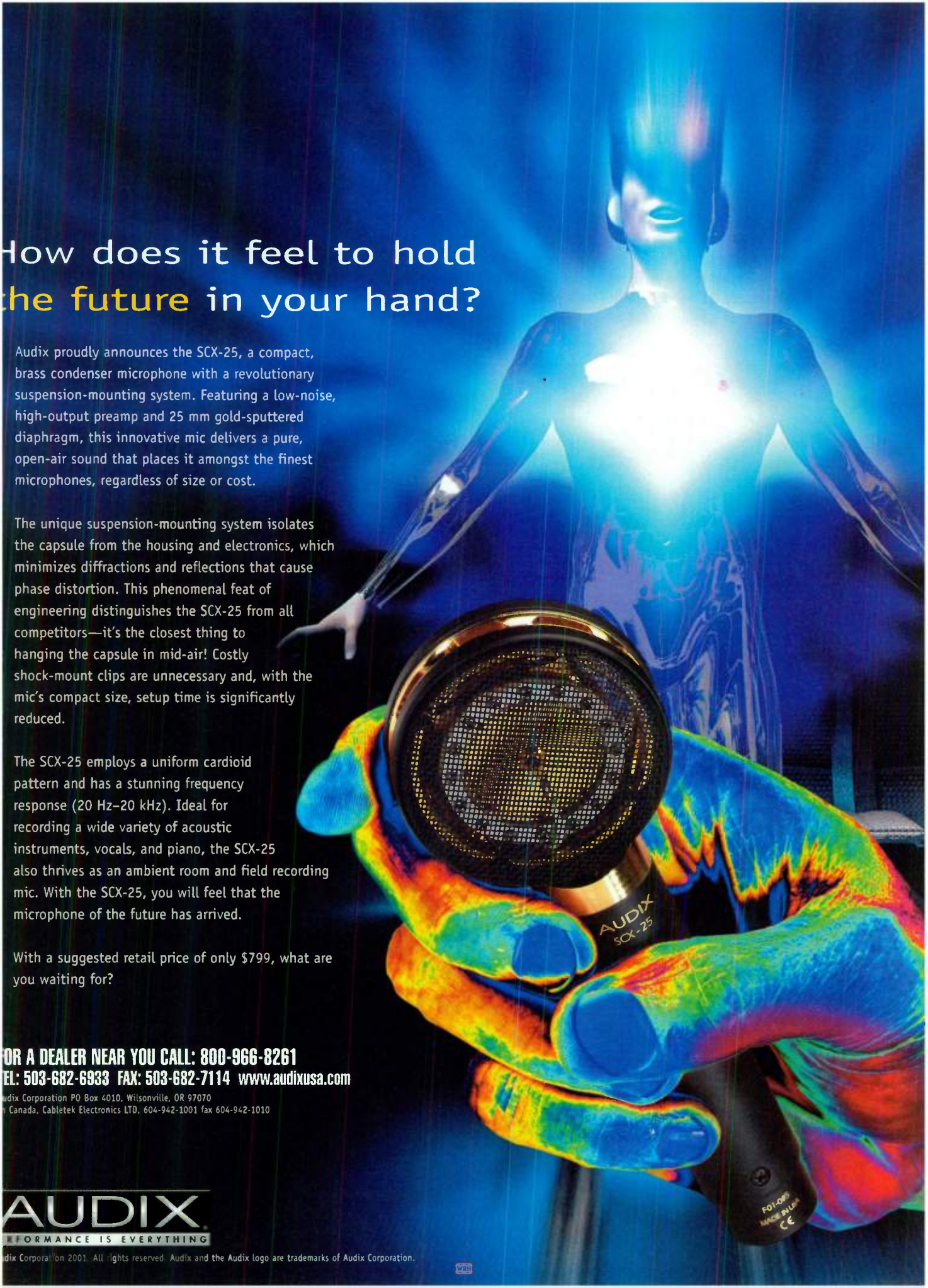
Sonic Implants Network; tel. (781) 641-0063; e-mail studio@sonicimplants.com; Web www.sonicimplants.com

IK MULTIMEDIA

T-Racks 24 (Mac/Win)

By Steve Broderson

As 24-bit resolution becomes more prevalent in the recording studio, software makers are busy releasing 24-bit versions of their products. Fortunately, IK Multimedia has done more than simply add higher resolution to one of its products,


How does it feel to hold
the future in your hand?
Audix proudly announces the SCX-25, a compact, brass condenser microphone with a revolutionary suspension-mounting system. Featuring a low-noise, high-output preamp and 25 mm gold-sputtered diaphragm, this innovative mic delivers a pure, open-air sound that places it amongst the finest microphones, regardless of size or cost.
The unique suspension-mounting system isolates the capsule from the housing and electronics, which minimizes diffractions and reflections that cause phase distortion. This phenomenal feat of engineering distinguishes the SCX-25 from all competitors—it's the closest thing to hanging the capsule in mid-air! Costly shock-mount clips are unnecessary and, with the mic's compact size, setup time is significantly reduced.
The SCX-25 employs a uniform cardioid pattern and has a stunning frequency response (20 Hz–20 kHz). Ideal for recording a wide variety of acoustic instruments, vocals, and piano, the SCX-25 also thrives as an ambient room and field recording mic. With the SCX-25, you will feel that the microphone of the future has arrived.
With a suggested retail price of only $799, what are you waiting for?
AUDIX
SCX-25
FOR A DEALER NEAR YOU CALL: 800-966-8261
TEL: 503-682-6933 FAX: 503-682-7114 www.audixusa.com
udix Corporation PO Box 4010, Wilsonville, OR 97070
Canada, Cabletek Electronics LTD, 604-942-1001 fax 604-942-1010
AUDIX
ERFORMANCE IS EVERYTHING
udix Corporation 2001. All rights reserved. Audix and the Audix logo are trademarks of Audix Corporation.

now called *T-Racks* 24 ($299). It's almost a new program, and it's free for registered users of the original *T-Racks* (see the April 2000 issue for the *T-Racks* review).

New Racks

When you upgrade to *T-Racks* 24, you can joyfully rip out (I mean, gently remove) the hardware dongle from your computer, because it's been replaced with a software encryption scheme. As its name implies, *T-Racks* 24 now reads and writes 24-bit audio files, and if necessary, it can convert them to 16-bit, 44.1 kHz audio. It also processes single Pro Tools 24-bit audio tracks at full resolution, though not in real time, because *T-Racks* 24 is a standalone program rather than a plug-in.

T-Racks' elegant design resembling a stack of analog gear is intact, but users of previous *T-Racks* versions will notice some new knobs. A Ratio control that ranges from 1.5:1 to 4.68:1 now appears on the compressor. The compression is on the gentle side, but if you use it in conjunction with the limiter module, you can still throw your sound against a pretty solid brick wall.

T-Racks 24's improved multiband limiter offers a new algorithm that lets it work more transparently as it increases apparent loudness. The output stage has a new attitude, too, featuring a Saturation knob; the original version had only a Hard/Soft toggle switch. The Saturation control allows hard-edged digital clipping, warmer analog saturation, and all points in between.

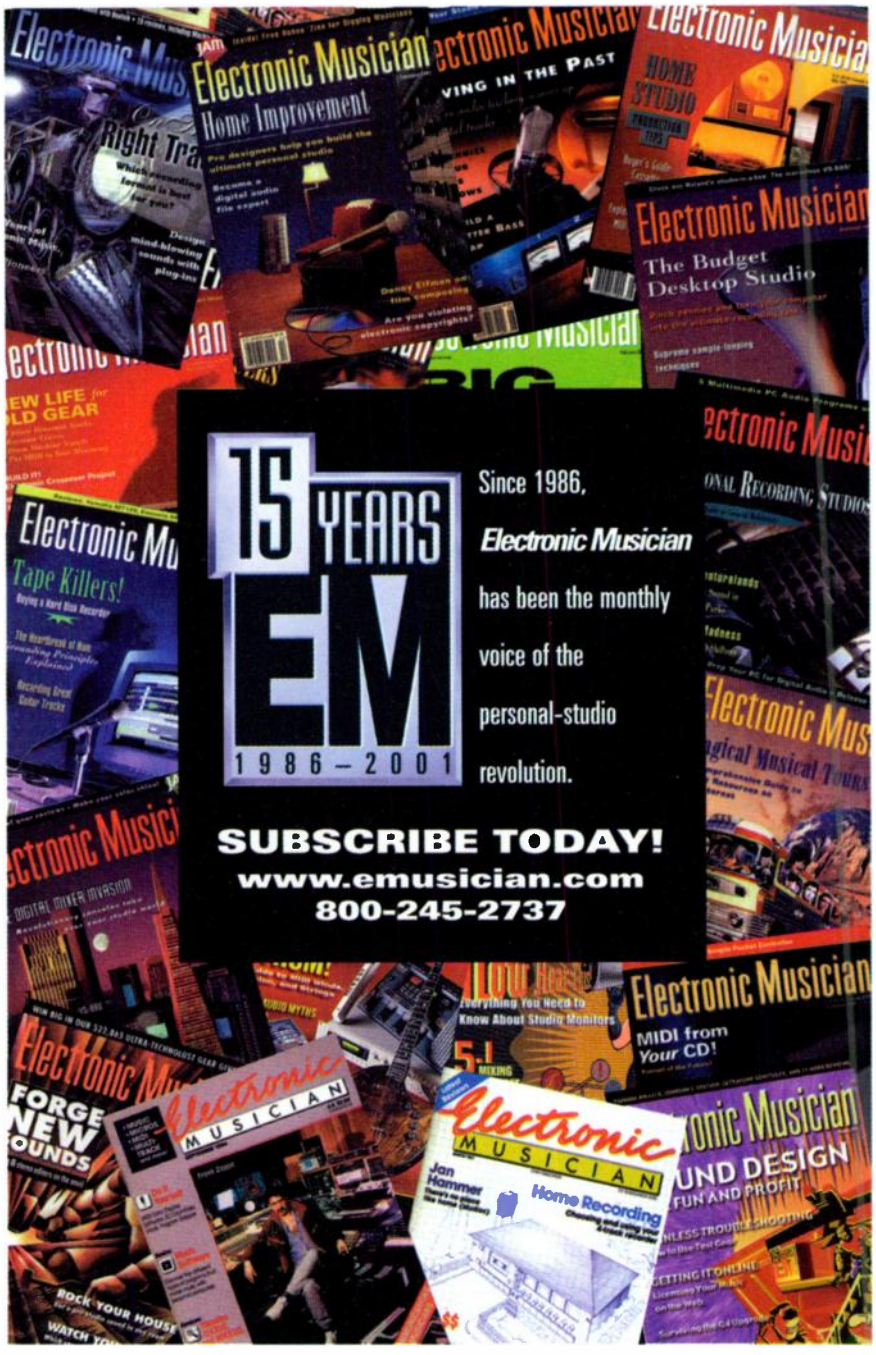
The update includes eight new skins for giving your virtual analog rack a makeover. The new visuals aren't entirely eye candy; the pop-up level meter now has a toggle button, labeled 10x, with which you can zoom in at high resolution on only the top level of your peaks (from 7.2 to 0 dB). If you see "overs" this close, believe me, you have overs. For quick reference, additional over LEDs appear at the output section.

Another new touch offered by *T-Racks* 24 is a three-position switch for stereo, mono, and difference monitoring, allowing you to spot phase and stereo-image problems. Although the mastering stage is a bit late for discovering such problems, it's still a nice final check. More than 50 presets have been added, and they're implemented in a more flexible manner than those in the previous version. Former presets affected all four modules (EQ, compressor, limiter, and output stage) simultaneously; the new presets affect only one module at a time, and by selecting a different preset for each module, you can mix and match at will.

Removing the Cover

One of *T-Racks* 24's new additions is the ability to tweak internal settings that were fixed and inaccessible in the original version. By manipulating those settings in a text file, you can tell *T-Racks* 24 to perform frequency-dependent compression and limiting (de-essing) or to change the multiband limiter's input threshold, among other things. Even if you're not inclined to tweak parameters, you can still benefit from the feature by downloading home-brewed configurations that others have uploaded to the *T-Racks* Web site.

T-Racks 24 retains the feel and improves the sonic characteristics of its predecessor. The interface is still intuitive to navigate



IK Multimedia's *T-Racks* 24 is a 24-bit update to its *T-Racks* 1.1 mastering software. The new features include 10x magnified peak metering, a compression-ratio control, saturation level and shape, and mono and difference monitoring.

and to manipulate, and I'm amazed at the gain I can squeeze out of my audio files. Some of the knobs, such as Ratio and the Saturation knee controls, are tiny, but I had no trouble dialing in precisely the values I wanted. The *T-Racks* Web site has posted patches that fix problems with *T-Racks* 24's handling of mono files, which were the only bugs I encountered. Unfortunately, MIDI control is not supported. As a result, you cannot automate changes or use a controller other than a mouse.

For Everyone

New users will love the warm analog sound that *T-Racks* has always exhibited; mastering professionals will love the precision peak meters; and original *T-Racks* users certainly will love the big jump in their investments' functionality at no cost to them. IK Multimedia hasn't even raised the price with the *T-Racks* 24 release. The upgrade is not merely a superficial touch-up or bug fix: *T-Racks* 24 is a thoroughly well executed overhaul to an already great product. Download a demo of *T-Racks* 24 from *T-Racks'* Web site.

Overall EM Rating (1 through 5): 3.5

IK Multimedia; tel. (866) 243-1718; e-mail info@t-racks.com; Web www.t-racks.com

SONIC FOUNDRY

World Pop Loops for Acid

By Zack Price

Eastern and Western musical styles have been cross-pollinating for decades. Even so, that exchange of musical expression has only recently become a fully flowered hybrid style. Sonic Foundry's *World Pop Loops for Acid* ($59.95), produced by Richard Michos, is a construction kit of Eastern and Middle Eastern instruments and vocalizations that lets users experiment with

PrimeSounds.com

These are just a few of PrimeSounds' exclusive SamplePack™ series:

On The Jazz Tip - Virtual Band
The penultimate production tool for all things jazzy of course! Whether hip hop,nu classic soul, trip hop, or just about any other modern dance style, this is 100% uncut funk. Created by a seven piece band.

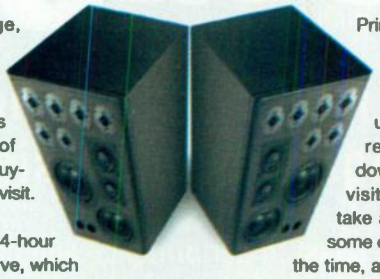
Ambient Pulses
These waves cleverly conceal various pulsating rhythms. Rhythms that range from the obvious to those that exist free of the constant and the inert. Whatever the objective, they will surely steer any track toward the unknown.

Irie Roots Reggae
This series will let you bring a little piece of Kingston into your studio. A selection of Roots Reggae instruments so authentic you can almost smell the illicit substances filling the air. Varied tempos allow you to choose your rankin mood.

Methods of Mayhem
The sounds from this classic sampling CD are now available on PrimeSounds only. Prepare your ears for an onslaught of sonic deformities: Twisted guitar riffs, deranged drum loops, hums and hisses – if it's ugly, you'll find it here.

70's Disco Series
Loops, intros, fills and outros that evoke 70's disco so perfectly that you will want to install a mirrorball in your studio. Comes complete with separately sampled drum sounds, for maximum customizability. All played live by professionals.

Too much is not enough!



PrimeSounds.com is a huge, searchable library for producers, song writers, remixers and anyone else in need of unique, high-quality sounds and samples. If you're tired of expensive sample CDs and buying sounds unheard, pay us a visit.

PrimeSounds members get 24-hour access to our extensive archive, which currently holds **more than 18.000 loops, sounds and multi-samples!** But don't get hung up on those figures; our archives are constantly growing, with new sounds and samples added every week of the year. You'll be getting more sounds than you can handle.

PrimeSounds lets you to search for, and find, a specific sample or SamplePack in seconds. And all sounds can be monitored directly on the site, letting you listen before you download.

PrimeSounds is a subscription service, which means that in order to download our sounds, you will have to sign up for a membership. But relax. All areas except the downloading areas are open to visitors. So please feel free to take a look around. And listen to some of the sounds. Or, if you have the time, all of them.

When you decide to join PrimeSounds, you will find yourself downloading within minutes. With a PrimeSounds account, you pay by the month and download the sounds you need, when you need them. It's as simple as that. Oh, and did we mention that it's real cheap too? **Only $10/month** *(with a 12 month subscription).*

But don't listen to us, let your ears decide: Log on to www.primesounds.com now!

Your Ever Expanding Online Sample Resource

in partnership with steinberg

SELLING EQUIPMENT?

GET IT SOLD!

It's Fast and Easy on Digibid!

digibid.com
Auction Network
an IndustryClick solution

www.digibid.com

©2000 Digibid, an IndustryClick community. All Rights Reserved.

onstage™
FOR THE PERFORMING MUSICIAN

Onstage is the exciting new monthly magazine for musicians!

Are you seeking the latest in performance and promotion? Whether you're a full-time professional or a weekend warrior, *Onstage* is your all-access pass to success as a performing musician!

Subscribe online at: www.onstagemag.com
or order toll-free at: 800/275-1989

world-pop styles. A fair chunk of Western instruments is included for good measure.

Take Two Tablas

Creating successful world pop involves coming up with the right blend of Eastern and Western rhythms, and this CD-ROM does not disappoint. For example, *World Pop Loops for Acid* contains 26 tabla patterns, which are mandatory for a collection such as this, and a small assortment of miznah, rahiz, and dumbek loops. In addition, a few shaker, rattle, and tambourine loops add just the right spice to the drum-kit and percussion patterns. Unfortunately, a few conga and marimba patterns don't quite fit with the rest of the percussion loops. I would gladly exchange those patterns for more dumbek, miznah, and rahiz loops. The CD-ROM also contains a variety of straight pop and rock drum-kit loops as well as a limited number of drum kits with effects that worked well in my projects.

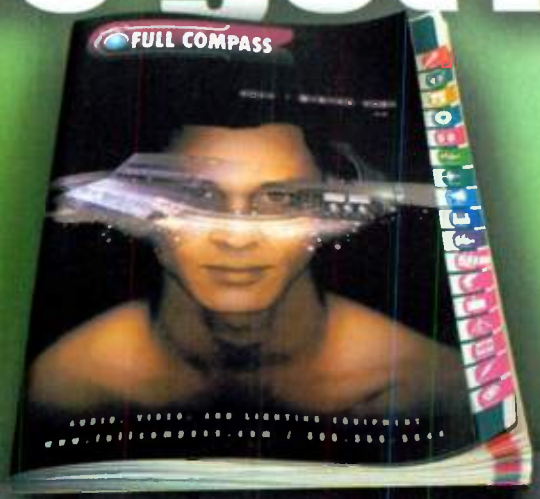
Indian, Pakistani, and Middle Eastern vocal phrases are also important components of world pop. In that category, the assortment of female vocal loops is too small. Furthermore, some female vocal loops sound suspiciously masculine—I'd prefer more examples of the high, lilting style of classical Indian female singing. On the other hand, the CD-ROM contains an enormous assortment of male vocal loops. By and large, those are excellent except for the five Classical loops, which have a solo instrumental background that diminishes the loops' usefulness. My Waste of Space Award, however, goes to the sound file Yeah 2000. Its reggae-inspired rap is not only incomprehensible and grating to the ear but also incompatible with the CD-ROM's remaining loops. The disc space it occupies would have been better filled by extra dumbek patterns.

All Strung Out

No collection of world-pop loops is complete without a good variety of Eastern wind and stringed instruments. *World Pop Loops for Acid* contains a small but excellent assortment of flute, bansuri, ney, and shenai loops. Many are long phrases that you can easily divide into smaller phrases or combine into extended melody lines. With the exception of the shakuhachi loops, however, many of the non-Indian

You want it.

We got it.



Now get it.

Inspiring deals on professional audio, video and lighting equipment
from the people who know everything about it.

COMPASS XPRESS

800.476.9886

Need it now? Extended hours.

8am to 10pm CST M-F.

10am to 6pm CST Sat.

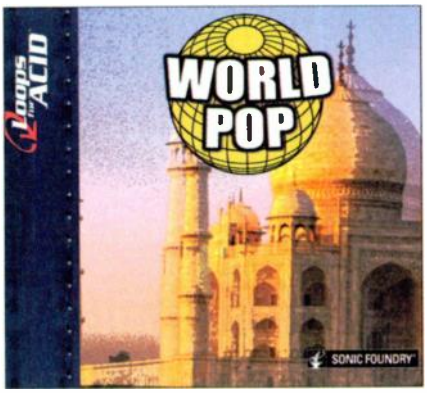
Great deals. All the time.

Call 800.356.5844

FULL COMPASS

9am to 5:30pm CST

8001 Terrace Avenue Middleton, WI 53562 USA www.fullcompass.com



Sonic Foundry's *World Pop Loops for Acid* offers plentiful Western and non-Western instrumental and vocal loops that can add an ethnic flavor to your music.

and Middle Eastern ethnic instruments usually don't fit well when used with the rest of the loops.

The entire Stringed Instrument group is something of a disappointment, especially the Chinese violin patterns. Although the eight violin loops are uniformly excellent, they are too few in number—the violin is an essential element in many non-Western styles. Similarly, the limited number of santur and surmandel loops offers limited variety in that category. The worst omission, however, is the complete lack of sitar, sarod, and oud riffs; adding those would make up for the deficiencies in the other stringed instruments. The best thing about that group is the set of 62 guitar loops, which range from clean acoustic, 12-string, and electric riffs with an Eastern flavor to straight-ahead rock chords and riffs.

In addition to the drum kit and guitar loops mentioned, the *World Pop* CD-ROM has other Western electronic-instrument sounds. For the most part, they are synth-based drones. Although not extensive, the collection consists of deep single-note drones and drones with evolving textures. Similarly, the keyboard sounds could almost be classified as drones, but they are actually low, slow-moving chord progressions. The least-useful Western sounds are the eight bass-synthesizer loops. I would consider using only two from that small group.

Sins of Commission and Omission

The *World Pop* CD-ROM contains too few loops of certain instruments and completely lacks loops of other essential instruments. I could also argue that some loops don't belong in the collection. Even so, loops on the original *Acid* loop CD-ROM (and perhaps on other libraries in your collection) can easily compensate for some weaknesses. Overall, the *World Pop* CD-ROM offers much to the *Acid* user who wishes to create music in which East meets West. The collection may not let you create every style of world pop imaginable, but it takes you a long way toward that goal. ●

Overall EM Rating: 3.5

Sonic Foundry; tel. (800) 577-6642 or (608) 256-3133; e-mail customerservice@sonicfoundry.com; Web www.sonicfoundry.com

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

Sell Your Music!

Attention bands and musicians:

Are you an individual or band with self-released music for sale?
Now you can run an EM classified for $35 and sell your music to over 50,000 readers!

Tell Me More!

INDIE MUSIC CDs FOR SALE

Modus; The Twin Jade Sessions
Ground-breaking improv funk jazz from S.F.,CA. Check out samples at www.cdbaby.com/modus

Benny Rietveld; Mystery of Faith
Alt Jazz/Rock by Miles Davis/Santana bassist. $15 w/Carlos Santana, Barbara Higbie. www.bennyworld.com

Myles Boisen; Scrambledisc
A masterpiece of studio cutups and improvisation. Audio CD $15 mylesaudio@aol.com

Gino Robair; Singular Pleasures
Industrial Percussion Solo Performance CD $10. Audio Format www.rastascan.com/brd023.html

$35 includes Up to four lines of text (27-32 character spaces per line), and band name in **bold**. You must run a minimum of three issues in a row. Prepayment is required by credit card or check.

Please mail the following text (in order) to emclass@intertec.com:
• Band Name (underline if bold type is desired) • Music Style/genre
• Price of your music product • Web address OR e-mail address (just one.)

Send your ad with the following required information: Your name, address and daytime phone number. Check or credit card information. We accept Visa, Amex, Discover and Mastercard. Include expiration date. We will charge the card once per month, for three months. No additional copy/text is allowable at this rate; this offer is only available for self-released, independent music releases. This is not applicable to production & sound effects libraries or sampling CDs. Send your ad and payment to: EM Classifieds, 6400 Hollis St., Ste. 12, Emeryville, CA 94608.

Ph: (800) 544-5530 Fax : (510) 653-8171 E-mail: emclass@primediabusiness.com

Coming Soon...

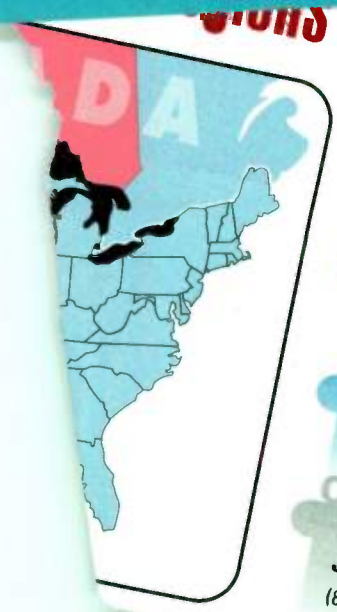
Featuring online product demonstrations of the hottest new gear on the market today!

Turn to:

Electronic Musician®

and www.emusician.com

...tors and Representatives



Northwest
Joanne Zola (510) 653-3307
jzola@primediabusiness.com

Southwest
Mari Stancati (323) 845-1881
mstancati@primediabusiness.com

East Coast/Europe
Joe Perry (770) 343-9978
jperry@primediabusiness.com

Classifieds
Kevin Blackford (West Coast)
Jason Smith (East Coast)
(800) 544-5530 or (510) 653-3307
emclass@primediabusiness.com

ADVERTISER INDEX

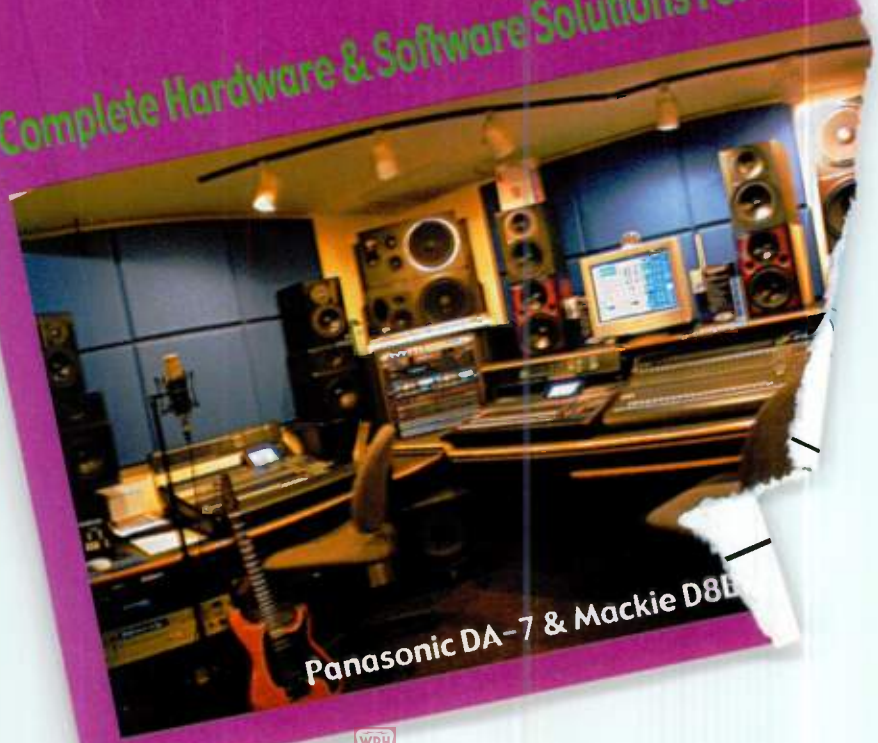
ADVERTISER	INTERNET	PAGE
8th Street Music	www.8thstreet.com	174
AKG	www.akgusa.com	23
Antares	www.antarestech.com	147
ART	www.artproaudio.com	36
Audio Computing	www.audioproshop.com	94
Audix	www.audixusa.com	185
B&H Photo-Video	www.bhphotovideo.com	194–195
Bayview Pro Audio	www.bayviewproaudio.com	176
BIAS	www.bias-inc.com	50 A/B
BIAS	www.bias-inc.com	50–51
Big Fish Audio	www.bigfishaudio.com	175
Big Fish Audio	www.bigfishaudio.com	173
Big Fish Audio	www.bigfishaudio.com	177
BitHeadz	www.bitheadz.com	95
Broadjam	www.broadjam.com	165
Brooklyn Boy	www.brooklynboy.com	155
Cakewalk	www.cakewalk.com	71
Carvin	www.carvin.com	145
dbx Professional Products	www.dbxpro.com	87
Digibid #1	www.digibid.com	86
Digibid #2	www.digibid.com	188
Discrete Drums	www.discretedrums.com	
East-West	www.soundsonline.com	
Edirol	www.edirol.com	
EGO SYS		
Emagic (Gold EXS)		
Emagic (Teaser)		

ADVERTISER	INTERNET	PAGE
Rock n' Rhythm	www.rocknrhythm.com	128
Rode Microphones	www.rodemicrophones.com	73
Roland	www.rolandus.com	59
Roland	www.rolandus.com	4–5
Royer Labs	www.royerlabs.com	138
Sam Ash	www.samash.com	38–39
Samson Technology (MRS 1044)	www.samsontech.com	60–61
Samson Technology (S Class)	www.samsontech.com	82–83
Sonomic	www.sonomic.com	58
Sound Quest	www.squest.com	25
SRS Labs Inc	www.srslabs.com	131
Steinberg (Halion)	www.steinberg.net	53
Steinberg (Midex 8)	www.steinberg.net	55
Stipko	www.buzzine.com	207
Studio Projects	www.studioprojectsusa.com	
Sweetwater Sound #1	www.sweetwater.com	
Sweetwater Sound #2	www.sweetwater.com	
Sweetwater Sound #3	www.	
Sweetwater Sound #4		
Tascam (GigaStudio)		
Tasca		

B&H
PHOTO - VIDEO - PRO AUDIO

- The Latest Gear At The Best Prices
- Expert Advice From Working Professionals
- Worldwide Shipping Usually Within 24 Hours

Complete Hardware & Software Solutions For Comp



FOR FREE INFORMATION

FROM EM ADVERTISERS, VISIT www.emusician.com/rs

AND CLICK ON READER SERVICE APPLICATION.

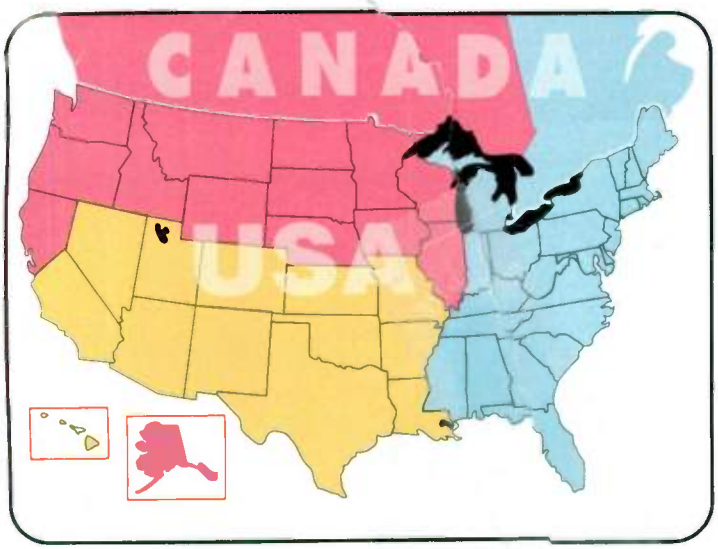
EM's Online Reader Service is the quick and easy way to contact advertisers to receive **FREE** product information. Simply go to **www.emusician.com**. From our Online Reader Service page you can then select the issues and the advertisers you are interested in. It's that simple. Your request is immediately e-mailed to the advertiser.

Also, while you're there, take a moment to complete our RATE THE ARTICLES survey in each issue. We want to know what works for you!

IMPORTANT NOTICE TO READERS:

Reader service inquiries are sent directly to the advertiser, who is solely responsible for sending product information. Electronic Musician can not guarantee a response from all advertisers.

EM Advertiser Sales Regions and Representatives



Northwest
Joanne Zola (510) 653-3307
jzola@primediabusiness.com

Southwest
Mari Stancati (323) 845-1881
mstancati@primediabusiness.com

East Coast/Europe
Joe Perry (770) 343-9978
jperry@primediabusiness.com

Classifieds
Kevin Blackford (West Coast)
Jason Smith (East Coast)
(800) 544-5530 or (510) 653-3307
emclass@primediabusiness.com

B&H

PHOTO - VIDEO - PRO AUDIO

- The Latest Gear At The Best Prices
- Expert Advice From Working Professionals
- Worldwide Shipping Usually Within 24 Hours

Complete Hardware & Software Solutions For Computer-Based Audio Production

Panasonic DA-7 & Mackie D8B Stations

Interactive Mic Shootout

Coming Soon...

Featuring online product demonstrations of the hottest new gear on the market today!

Turn to:

Electronic Musician®

and www.emusician.com

ADVERTISER INDEX

ADVERTISER	INTERNET	PAGE
8th Street Music	www.8thstreet.com	174
AKG	www.akgusa.com	23
Antares	www.antarestech.com	147
ART	www.artproaudio.com	36
Audio Computing	www.audioproshop.com	94
Audix	www.audixusa.com	185
B&H Photo-Video	www.bhphotovideo.com	194–195
Bayview Pro Audio	www.bayviewproaudio.com	176
BIAS	www.bias-inc.com	50 A/B
BIAS	www.bias-inc.com	50–51
Big Fish Audio	www.bigfishaudio.com	175
Big Fish Audio	www.bigfishaudio.com	173
Big Fish Audio	www.bigfishaudio.com	177
BitHeadz	www.bitheadz.com	95
Broadjam	www.broadjam.com	165
Brooklyn Boy	www.brooklynboy.com	155
Cakewalk	www.cakewalk.com	71
Carvin	www.carvin.com	145
dbx Professional Products	www.dbxpro.com	87
Digibid #1	www.digibid.com	86
Digibid #2	www.digibid.com	188
Discrete Drums	www.discretedrums.com	164
East-West	www.soundsonline.com	26–27
Edirol	www.edirol.com	125
EGO SYS	www.egosys.net	93
Emagic (Gold EXS)	www.emagic.de	37
Emagic (Teaser)	www.emagic.de	35
Emagic (wbPro)	www.emagic.de	47
E-mu Systems	www.emu.com	9
Frontier Design Group	www.frontierdesign.com	IBC
Full Compass Systems	www.fullcompass.com	189
Furman Sound	www.furmansound.com	160
Garritan Orchestral Strings/GigaStrings	www.garritan.com	75
Glyph (Firewire)	www.glyphtech.com	137
Grandma's Music	www.grandmas.com	183
HHB (BurnIT)	www.hhbusa.com	139
Kay Sound	www.kaysound.com	149
Korg (D1600)	www.korg.com	21
Korg (Karma)	www.korg.com	10–11
Korg (Triton)	www.korg.com	129
Korg (Workstation)	www.korg.com	67
KRK Systems	www.krksys.com	81
Kurzweil	www.kurzweilmusicsystems.com	133
Leigh's Computers	www.leighs.com	183
Lexicon	www.lexicon.com	57
Mackie ((MDR 24/96)	www.mackie.com	2–3
Mackie (1604VLZ)	www.mackie.com	65
Mackie (S500)	www.mackie.com	151
Mark of the Unicorn	www.motu.com	BC
Midiman	www.midiman.com	143
Midiman (Surface One)	www.midiman.com	18–19
Midiman/Propellerhead	www.propellerheads.se	49
Musician's Friend	www.musiciansfriend.com	161
MusicYo	www.musicyo.com	154
Muska & Lipman	www.muskalipman.com	130
Net4Music/Finale	www.codamusic.com/em	153
Nord	www.clavia.com	135
Notation Technologies	www.notationtechnologies.com	124
NoteHeads	www.noteheads.com	154
Novation	www.novationmusic.com	77
PG Music	www.pgmusic.com	167
Prime Sounds	www.primesounds.com	187
QCA	www.pol.com/QCA	140
Rock n' Rhythm	www.rocknrhythm.com	128
Rode Microphones	www.rodemicrophones.com	73
Roland	www.rolandus.com	59
Roland	www.rolandus.com	4–5
Royer Labs	www.royerlabs.com	138
Sam Ash	www.samash.com	38–39
Samson Technology (MRS 1044)	www.samsontech.com	60–61
Samson Technology (S Class)	www.samsontech.com	82–83
Sonomic	www.sonomic.com	58
Sound Quest	www.squest.com	25
SRS Labs Inc	www.srslabs.com	131
Steinberg (Halion)	www.steinberg.net	53
Steinberg (Midex 8)	www.steinberg.net	55
Stipko	www.buzzine.com	207
Studio Projects	www.studioprojectsusa.com	85
Sweetwater Sound #1	www.sweetwater.com	33
Sweetwater Sound #2	www.sweetwater.com	98
Sweetwater Sound #3	www.sweetwater.com	157
Sweetwater Sound #4	www.sweetwater.com	208–209
Tascam (GigaStudio)	www.tascam.com	97
Tascam (MX-2424)	www.tascam.com	29
Tascam (US-428)	www.tascam.com	69
Taxi	www.taxi.com	127
TC Electronic	www.tcelectronic.com	41
TC Works	www.tcworks.de	45
Terratec/Fostex	www.fostex.com	46
Ti:Me	www.ti-me.org.com	159
Universal Audio	www.uaudio.com	15
Wave Digital	www.wavedigital.com	174
Waves	www.waves.com	17
West LA Music	www.westlamusic.com	164
World Replication Group	www.worldreplication.com	171
X-Vision Audio	www.xvisionaudio.com	141
Yamaha (AW2816)	www.aw2816.com	13
Yamaha (Motif)	www.motifator.com	91

ELECTRONIC MUSICIAN MARKETPLACE ADS

Gefen	www.gefen.com	199
Media Form	www.mediaform.com	197
The Gate	www.gatemedia.com	198
Topaz	www.mediamat.com	196
Alpha Media	www.justdupeit.com	196
Multiloops	www.multiloops.com	196
Digital Disc Manufacturing	www.digitaldisc.com	197
Media Services	www.mediaomaha.com	197
CD Labs	www.cdlabs.com	197
Lonely Records	www.lonelyrecords.com	199
Independent Audio	www.independentaudio.com	197
Earthdisc	www.earthdisc.com	198
Neato	www.neato.com	198
Crystal Clear Sound	www.crystalclearcds.com	198
Triple Disc	www.tripledisc.com	199
Europadisk	www.europadisk.com	198
Recording Workshop	www.recordingworkshop.com	198
Sonic Reality	www.esoundz.com	196
Shreve Audio	www.shreveaudio.com	200
SE Electronics	www.seelectronics.com	200
Raven Labs	www.raven-labs.com	196
F7 Sound	www.f7sound.com	199
Mini Music	www.minimusic.com	199
Digital Domain	www.digido.com	200
Pacific North	www.pncd-arts.com	200

Detail

Character

Confidence

Resolution

Control

Maximum Potential

Deliverance

Visit The B&H Superstore

Featuring Our State-Of-The-Art
Interactive Pro Audio Showrooms

420 Ninth Ave
New York City

(Between 33rd & 34th Sts)

Call Toll Free:
800.947.5509

In NYC:
212.444.6679

On The Web:
www.bhphotovideo.com

The Professional's Source For All Of Your Pro Audio Equipment Needs

ProTools|24 Mix Plus Station

Interactive Studio Monitor Shootout

EM MARKETPLACE

NAKED DRUMS

24-bit.44.1k Multitrack Drum Loops

Easily imported into ANY 24-bit digital audio program.
Specially enhanced for *Pro Tools*!
(Includes tempo-mapped session documents.)

ROCK VOL. 1 - THE ESSENTIALS:
2cd-rom set Over 300 loops $99.95
Kick, Snare, Stereo Overheads, Tom1, Tom2, Tom3

POP R&B:
4cd-rom set Over 450 loops $149.95
Kick, Snare, Hi-Hat, Stereo Overheads, Tom1, Tom2, Tom3

To download the DEMO or to ORDER visit our website:
WWW.MULTILOOPS.COM
615-646-0150
To order by mail send Check or Money Order to:
MultiLoops Orders, PO Box 411, Pegram, TN 37143 (add $4.95 S&H)
Please specify Macintosh (SDII) or Windows (.WAV) Format.

FREE SOUNDS!

Download multisamples and loops from our exclusive FreeSoundz archive!

@ eSoundz.com

Unity DS-1·Sample Cell·Halion·EXS24·Reason·
GigaStudio·Sample Tank and more!

1-800-232-6186
www.esoundz.com

"CLEAN AND ACCURATE. A GREAT SONIC CARVER."
- BARRY RUDOLPH, MUSIC CONNECTION

RAVEN LABS TRUE BLUE EQ

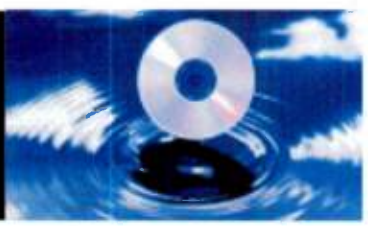
Introducing a unique approach to equalizers! The True Blue EQ is a 5 band semi-parametric designed to "enhance the essence" of your sound, while maintaining true signal integrity.

Unlike other EQ's, boost or cut is achieved by adding or subtracting the original signal to itself. The bandwidths in the boost mode were chosen for "musicality", while the bandwidths in the cut mode are narrower, creating a notch filter affect. This design philosophy makes it the ultimate choice for unmasking hidden qualities, reducing feedback, dealing with "hot" or "dead" spots on instruments, correcting room acoustics, and putting that certain air into your sound. You will notice the difference the first time you use it!

RAVEN LABS
16820 Nanette St.
Granada Hills, CA 91344
Tel./Fax: 818.368.2400
Internet: www.raven-labs.com

Just dupe it.
www.justdupeit.com
Email: sales@justdupeit.com
Bus. (615) 385-7202

1-800-363-3522
Original Concepts • Innovative Packaging
CD • DVD • CD ROM • Business Card CD's • Shaped CD's
Audio/Video Cass. • DVD/CD ROM Authoring
Graphic Arts • Web Development • Image/Logo Creation
Mastering/Editing • Posters, Flyers, Mailers



GRAPHIC DESIGN•PRINTING•MASTERING SERVICES

DIGITAL DISC MANUFACTURING INCORPORATED

CD•VHS•CASSETTE•VINYL
DVD AUTHORING AND REPLICATION

216 WALNUT STREET GARWOOD, NJ 07027
888.219.4456 www.digitaldisc.com 908.709.1243

SOUNDMAN OKMII and OKMII Studio
Binaural Stereo Microphone Headset
The ultimate stereo image.
• Plug straight into portable recorders, soundcards and camcorders.
• Record your gig discretely – looks like in ear mini headphones.
• Record ambient sounds, interviews, choirs and orchestras.
Great stereo sound with video.
43 Deerfield Rd. Portland, ME 04101 - Phone (207) 773-2424
info@independentaudio.com - www.independentaudio.com
INDEPENDENT AUDIO

MEDIA services
CALL with any questions or inquiries
1.888.891.9091
www.medlaomaha.com
LOW PRICE GUARANTEE!
NEW 10 FREE CDR's
MEDIA SERVICES WILL BEAT ANY QUOTE BY 5% OR RECEIVE 10 FREE CDR'S
PROVIDE A COPY OF A COMPETITORS WRITTEN QUOTE
ON THEIR LETTERHEAD (1000 piece minimum order)
4 Panel Retail Ready CD's
Includes:
Glass Mastering, CD Replication (with 3 color printing)
CD films, 4 panel (4/1 Book), Tray (4/0), Print Films,
FREE Barcode, Jewel Case, Assembly & Wrap
$1350
CD's .. Tapes .. CDR's .. Graphic Design ..
Designer CD's .. Posters .. Postcards ..
Printing .. DVD's .. CD-Rom's
SERVICES

The SCRIBE Series of Professional CD-R, DVD-R and Print Stations
Where Value and Versatility are Defined
NEW!

Starting at under $2,500!
Featuring:
• CD-R / DVD-R / Print station options — for a fully integrated system that creates, duplicates and automatically labels
• SmartDRIVE technology — to protect intellectual property and provide advanced professional audio features
• Wide Printer Selection — offering a variety of thermal transfer and inkjet disc labeling options; depending on your needs
1.888.607.1527 MediaFORM SMART TECHNOLOGY ™
www.mediaform.com

SERVING THE MUSIC INDUSTRY SINCE 1957
CD LABS™
The sounds of music
1000 CD'S only $699
Bulk Pack w/Mastering Included
DELUXE CD/CD-ROM PACKAGES
1000 w/4 pg 4 color inserts....$1395
500 w/4 pg 4 color inserts.. $1145
INCLUDED ABOVE: FREE BAR CODE, MASTERING, 3 COLOR CD, JEWEL BOXES & SHRINK WRAP. PLUS YOUR OWN WEB PAGE ON THE ORCHARD.COM WEBSITE FOR 1 YEAR
Prices are based on customer supplied plate ready film
ALSO AVAILABLE: 1 DAY SHORT RUN CD DUPLICATION, VINYL & CASSETTE DUPLICATION, POSTERS, GRAPHIC DESIGN & FILM
The owners of CD Labs have been serving the music industry for over 40 years. We guarantee complete satisfaction on all services..
10643 Riverside Drive, No. Hollywood CA 91602
(818) 505-9581..(800) 423-5227
Email..cdlabs@pacbell.net
Visit our website for more package options –www.cdlabs.com

LEARN the ART of RECORDING

You can get the practical, real-world skills needed to successfully start your career as a recording engineer or producer. For 29 years, thousands of students from the US and around the world have started their career at the Recording Workshop.

- The Original since 1971
- 8 Studio Facility / Latest Gear
- Very Affordable Tuition
- Hands-On Training
- 3 - 6 Students per Class
- 2 Month, 300+ hrs Training
- On-Campus Housing
- Job / Internship Assistance
- Financial Assistance

REC W

Contact us for a Free Brochure

800-848-9900

www.recordingworkshop.com

RECORDING WORKSHOP

email: info@recordingworkshop.com

Outside the USA: 740-663-2544 fax machine: 740-663-2427

455-L Massieville Road, Chillicothe, OH 45601

Ohio State Board of Proprietary Schools Registration #80-07-0696T

CDs • CD-ROM • CD-R • SHAPED CDs • AUDIO CASSETTES

NEED CDs?

the choice is

CRYSTALCLEAR DISC & TAPE

Trusted experience for over 30 years.

1-800-880-0073

visit us at www.crystalclearcds.com

DIGITAL MASTERING • ART DESIGN • PRINTING • PACKAGING

www.earthdisc.com

cd • cd rom • dvd • cassette • mastering • graphic design • printing

$1199.00 1000 CDs package includes: full color 2 page/4 panel insert 3 color on cd printing glass master, jewel box, shrink wrap

$986.00 500 CDs package includes: full color 2 page/4 panel insert 3 color on cd printing glass master, jewel box, shrink wrap

$1299.00 500 CDs we do it all! package includes: graphic design/film full color 2 page/4 panel insert 3 color on cd printing glass master, shrink wrap

500 Free CDs !!!

1.800.876.5950

THE GATE MEDIA GROUP

WWW.GATEMEDIA.COM

CD, CD-ROM, DVD AND VINYL REPLICATION
CD-R SCREEN PRINTING AND REPLICATION
AUDIO & DVD MASTERING & AUTHORING
COMPLETE GRAPHIC DESIGN SERVICES
POSTERS, STICKERS & POSTCARDS
PROMOTIONAL SERVICES

800-655-1625

FILM AND GRAPHIC DESIGN INCLUDED FREE!

1000 CD's Retail ready-$1395.00	GATE PROMO PLUS
500 CD's Retail ready-$1200.00	1000 CD's
2000 Bulk CD's-$1280.00	2000 Postcards
200 130gram Vinyl-$1295.00	1000 Posters
500 2-color CD-R's -$495.00	$2695.00

Member of Association for Independent Music

CD LABELING & PACKAGING FROM YOUR DESKTOP!

DESIGN • PRINT
APPLY • PACKAGE

40 FREE HIGH GLOSS CD LABELS with the purchase of a NEATO 2000 Kit. Use Coupon ENAM when you CALL to CLICK

ONLY $29.95

KIT INCLUDES
- NEATO 2000 CD Label Applicator
- Assortment of Labels and Jewel Case Inserts
- MediaFACE-II
  - Design Software (PC), Templates (Mac)
  - Digital Background Art for Labels and Inserts
  - Label and Insert Templates for Popular Graphics Programs (PC/Mac)

800-984-9800

Also available...
Other Media Labeling Products Including – Video Sleeves/Wraps/Labels, Business Card CD Labels/Sleeves

NEATO Media Labeling Products

250 Dodge Ave. • East Haven, CT 06512 • 800-984-9800 • 203-466-5170 • Fax 203-466-5178

www.neato.com

CD REPLICATION

Retail-Ready CD Packages with 4/4 Color Printing - no extra charge!

- **Vinyl Records** - *Direct Metal Mastering*
- **Mastering Studio** - *88 Charted Hits Every Week*
- **Cassette Duplication** - *Lyrec w/ HX-Pro*
- **On-Demand Printing** - *Stunning Color*
- **Graphics Studio** - *Custom Designs*

Work direct with the factory and save. All products made in our plant, the U.S.' most complete facility!

OUR 25th YEAR!

NEW! - Digital Business Cards & Shaped Disks

Best Service...Best Price...Period.

Free catalog or quote: (718) 407-7300

(800) 455-8555

Major credit cards accepted

EUROPADISK,LLC

Check out our cool website at: www.europadisk.com

1000 4 Panel CDs: $1375

From your CDR Master and Art Files

Package includes:
Glass Master, Replicated CDs
Full Color Covers & Traycards (4/1)
Assembly into Jewelboxes and Polywrap

FILM OUTPUT
BARCODE
COLOR PROOF
4 PANEL COVER
CLEAR TRAY
3RD COLOR ON DISC

Short Run CDs, Quick Turns, Business Card CDs, DVDs
Graphic Design, Digital Mastering, and Multimedia Production
Also Available

TRIPLE DISC

800-414-7564 OR WWW.TRIPLEDISC.COM

QUALITY CDS, ON TIME, AT AFFORDABLE PRICES WITH SUPERIOR CUSTOMER SERVICE

sound effects that...

SCREAM!

Concept:FX™ custom designed, royalty-free SFX
AIFF and WAV on CD-ROM

F7 Sound and Vision • 813-991-4117

www.f7sound.com

The DVI Repeater & the DVI to ADC Conversion Box

Extends & Connects an Apple Flat Panel Display to any Mac or PC Computer.

The DVI Repeater works by doubling the distance of any DVI cable with no loss of quality. The DVI to ADC Conversion Box converts DVI, USB and power to the ADC connection.

818-884-6294 800-545-6900 www.gefen.com

If you sell MIDI files, software, patches or samples... reach over 73,000 musicians by running a classified ad in Electronic Musician.

(800) 544-5530

Lonely Records

- Complete Printing Services
- Promotion & Distribution
- Graphic Design
- Web Services
- CD and DVD
- Cassettes
- Mastering
- Barcodes

100 Retail CDs complete!
$199

1000 Bulk CDs complete!
$560

1000 Retail CDs complete!
$990

www.LonelyRecords.com
1.800.409.8513

We will beat any of our competitors prices on CDs, CDR, DVD, cassette, mastering or graphic design packages by as much as 5%. Call for details!

www.shreveaudio.com

CALL US!!! 800.214.9222

Roland XV-88 VS-2480 CDX-1 New!

MACKIE Digital Systems HDR 2496 D8B HR 824

AKAI professional DPS12 v2 MPC2000XL Killer Deals!!

E-MU E4 Platinum Mo-Phatt Digi001 Firewire 828 ProjectX HOT ITEM!

KORG Triton ProX Kaoss Pad EA-1

ALESIS ART SHURE TASCAM MOTU 2408 GLYPH crown BOSS JBL PreSonus BEHRINGER JUST LISTEN.

Danelectro Parker GUITARS

We also carry a huge line of guitars and amps, new and vintage!!! CALL today!!!

SAMICK PRS GUITARS

SE Electronics

SE5000 - Tube microphone

HIGH - END PERFORMANCE
LOW - END PRICE

"Vacuum tube warmth for digital recordings!". SE Electronics answers the call from project and professional studios. The SE5000 is the latest condenser microphone from SE Electronics. Rich, warm sound is the product of the large 1" gold vapor diaphragm and reliable 12AT7 tube performance. The SE5000 comes in a stunning blue and gold finish and is accompanied by a remote regulated power supply and cable, the SHM5 elastic suspension shock mount and deluxe case. Classic performance reborn at a fraction of the cost. Listen and See!

* CARDIOID
* 20HZ-18KHZ
* NOISE LEVEL 18dB-A

$299

5850 Commerce Blvd, Suite C-1 Rohnert Park, CA 94928
Tel:(707)588-8942 www.seelectronics.com
Dealer Inquires: Fax-(707) 588-8943

Master at DIGITAL DOMAIN™ where music still sounds like music. Where punch, vitality, space, imaging, clarity, warmth and quality are not just buzz words. We enhance musical values with specialized techniques invented here.

Unsurpassed mastering quality by **Bob Katz**. Custom-built hardware and software. **Stereolization, Microdynamic Enhancement.** Unique Processes. Sonic Solutions Editing. Tube and Solid-State Analog Recorders.

CD Mastering is an art. Levels, dynamics, fades, spacing... everything is important to you and to us.

Recorded & Mastered 1997 Latin Jazz Grammy

CD Replication... Booklet Printing... Graphic Design...

How to make a superior pressed CD:
1) 1X speed Glass Mastering
2) Quality control
3) Attention to detail
4) Personalized Service
5) Good, clean packaging and packing
6) Dependable, on-time delivery

Digital Domain
(800) 344-4361 In Orlando, FL

The Definitive, Award-Winning Internet CD Mastering Website
http://www.digido.com

Major Label Quality
Indie Attitude
Musician's Prices

500 CDs with Printing
$899.00
includes: color separations glass master, jewel box, assembly and wrap

- Audio Mastering
- Graphic Design
- Prepress (film)
- Printing
- Packaging

50 CDs with Printing
$199.00
in as little as 3 days

Call today for our free CD manufacturing guide

PACIFICNORTH COMPACT DISC
www.pncd-arts.com 1 800 662-4033

EM CLASSIFIEDS

ELECTRONIC MUSICIAN CLASSIFIED ADS are the easiest and most economical means of reaching a buyer for your product or service. The classified pages of **EM** supply our readers with a valuable shopping marketplace. We suggest you buy wisely; mail-order consumers have rights, and sellers must comply with the Federal Trade Commission as well as various state laws. **EM** shall not be liable for the contents of advertisements. For complete information on prices and deadlines, call (800) 544-5530.

ACOUSTIC PRODUCTS

Tired Of Bad Sound? It's Time To Take A Stand.

Introducing the Auralex gramma

The GRAMMA is a hot new patent-pending device that floats an amp, monitor, subwoofer, turntable or more for nearly total acoustic isolation.

Whatever device you put on top of a GRAMMA will instantly perform a lot more like it was designed to!

You'll immediately notice dramatically truer tone, higher immunity to feedback and a level of resonance-free purity you never thought you'd get out of your gear! The GRAMMA absolutely ROCKS! Check it out TODAY!

"One word...WOW! The GRAMMA completely changed the bottom end (in my mastering studio). So much more definition and detail. Such a simple-looking piece yet so powerful!" Brian Forsker, Engineer/ProTuner

"(My) low end is much more focused...no room resonances...all the little buzzes & rattles went away immediately...my two recording amps stay on the GRAMMAs!" Lee Roy Parnell

"Really smooths out my guitar tones. The road crew started using GRAMMAs under the monitors, the Leslie® & drum mics...fantastic results all around." Jeff Tamelier

Auralex™ Acoustics · www.auralex.com · 800-95-WEDGE

SoundSuckers.com
1-888-833-1554
*Soundproofing Products & Supplies
*Full line of Professional booths
*Custom Projects of all kinds
E-mail: sales@soundsuckers.com

AcousticsFirst™
Toll Free: 888-765-2900
Full product line for sound control and noise elimination.
Web: http://www.acousticsfirst.com

WhisperRoom INC
SOUND ISOLATION ENCLOSURES
Celebrating over 10 years of reducing sound to a Whisper!
Recording, Broadcasting, Practicing

15 Sizes and 2 Levels of Isolation Available
New! SoundWave Deflection System
(Change parallel walls to non-parallel)
Immediate Shipping!
www.whisperroom.com
PH: 423-585-5827 FX: 423-585-5831

VocalBooth.com
Multi Purpose Recording & Practice Rooms

Starting at $1499
Affordable Portable 4x4, 6x6 & larger
(541)330-6045

Tell our advertisers you saw their ad in EM Classifieds

SILENT
58 Nonotuck St., Northampton, MA 01062
INFO (413) 584-7944 · FAX (413) 584-2377
ORDER (800) 583-7174
info@silentsource.com • www.silentsource.com
Acousticore Fabric Panels • Sound Barrier Isolation Hangers • A.S.C. Tube Traps Silence Wallcovering • WhisperWedge Melaflex • S.D.G. Systems • Tecnifoam R.P.G. Diffusors • Sonex • Sound Quilt

Check Out www.remixmag.com

BUSINESS OPPORTUNITIES

Starting a studio?
Get advice, ideas and guidance from an experienced studio owner and educator
www.CriticalPathCoach.com
301-596-5018

COMPUTER SYSTEMS

COMPUTERS for MUSIC.
Preconfigured Macs and PCs optimized for Cakewalk, Cubase, Digi 001, Digital Performer, Emagic, Gigasampler, Pro Tools LE/TDM, Sonar and more. Featuring audio & MIDI hardware from Digidesign, MOTU, Midiman, Frontier, RME. Optimized for MIDI sequencing, hard disk recording, A/V, CD-R mastering & duplication. Desktop, tower and rack-mount configurations available.
www.wavedigital.com (973) 728-2425.
Call for information about our new
Rack-mount Apple G4 Macs and PowerBook-based portable DAW solutions.

EMPLOYMENT OFFERED

Experienced MIDI Musician
for Traditional and Pop Latin Music. Latin music background and technical experience required. Call Veronica, Raf International, ASAP. (213) 387-1190 Fax (213) 387-4971

Have a Job to Fill?
Run a Classified in EM
800 544-5530

EQUIPMENT FOR SALE

The gear you need.
We've got it.
Recording • Guitars
Amplifiers • Pro Audio
Keyboards • & More
We have everything you need for studio and stage!

Sweetwater
music technology direct
800-222-4700
www.sweetwater.com
sales@sweetwater.com
5335 Bass Road, Fort Wayne, IN 46808
(219) 432-8176 • FAX (219) 432-1758

SINGERS! REMOVE VOCALS
Unlimited Free Backgrounds from Original Standard Recordings!
Thompson Vocal Eliminator VE-4
Free Brochure & Demo
24 Hour Demo Info Line
(770)482-2485 · Ext 8
LT Sound Dept MX1 7980 LT Parkway, Lithonia, GA 30058
Internet www.LTSound.com
Better Than Karaoke for Over 25 Years!

digital playroom
the professional & home studio place
Everything needed to create an audio & video studio. Ready to use out of the box. Sales, sevice and set-up.
Pro Tools, Final Cut Pro, Adobe & Other Pro Gear
(800) 822-6434
www.digitalplayroom.com

EM CLASSIFIEDS

EQUIPMENT FOR SALE

Every major brand of everything. Millions of dollars of musical gear in stock. **ALTO MUSIC** Guitars, recording, keyboards, amplifiers, drums, pro sound, new & used. One of the largest selections in the country. We ship everywhere!
680 Rt. 211 E.
Middletown, NY 10940
altomusic@altomusic.com
(845) 692-6922
www.altomusic.com

hundreds of items in stock
just point...click...and buy
www.toyspecialists.com
800 445 3330

Still the only
VACUUM-TUBE
electronic-music modules....
METASONIX
881 11th St, PMB 109, Lakeport CA 95453 USA www.metasonix.com (707) 263-5343

M3P DAW Monitor
Who needs a mixer ?
colemanaudio.com
Coleman Audio (516) 334-7109

WARM IT UP!!!!
Uncle Albert's VTD-2A
vacuum tube direct box
$449+Shipping
(800) 416-2444

Digital Recording
Factory Direct Discount Dealer
* Alesis * Yamaha * Sony * Tascam *
* Roland * Akai * Event Electronics *
* Digital Audio * Fostex * Korg *
Pro Audio Plus (800) 336-0199
Division of Rolls Music Center
www.rollsmusic.com

GREAT EQUIPMENT

YOUR AUDIO
SEAL OF QUALITY
STUDIO RESOURCES
EST. 2000
212-502-1880
234 WEST 30TH st. NYC 10001
yeraudio@aol.com

NO FUNNY AFTERTASTE

Hard Drive Noise A Problem?
Problem Solved.
Visit us at www.iso-box.com
ISO BOX™
SOUND CONSTRUCTION & SUPPLY, INC. • NASHVILLE, TN • (615) 884-8257

Pre-owned or new cosmetically flawed Digital recording equipment at near wholesale pricing. Mackie, Yamaha, Panasonic, Sony, Alesis, Tascam, Roland and more. Save thousand. Many new items have just had the box opened and never used. Over 350 brands. Absolutely the best prices anywhere! Over 72 years in business. Call today **(800) 264-6614** or (860) 442-9600. Email info@carusomusic.com.
Caruso Music 94 State St.,
New London, CT 06320
www.carusomusic.com

DACS FREQue II
Analog ring modulator.
INDEPENDENT AUDIO
www.independentaudio.com 207-773-2424

Sony MPX 3036 console
14 API 212s mic pre
10 API 560s EQs
Megamix 11 automation
with Mac IIci
(718) 387-7958
www.coyoterecording.com

FURNITURE

Studio [free catalog]
furnishings
ARGOSY.
800.315.0878 / 573.348.3333
argosyconsole.com

OMNIRAX
STUDIO FURNITURE
CODA D8
with Sidecars
OMNIRAX 800.332.3393 415.332.3392
FAX 415.332.2607
www.omnirax.com

The Case Specialists

Flight cases for guitars, pedalboards, mixers, drums, rackmount equipment, keyboards, DJ equipment, etc.

Call for quotes and FREE catalog

Discount Distributors
800 346-4638
In New York: 631 563-8326
www.discount-distributors.com

INSTRUCTION

Recording Engineer
Broadcasting
Multimedia/Digital/Video/Film
Radio/TV/Sports/News/DJ/Talk Show
No experience required!
On-the-job-training
in local major Recording Studios & Radio/TV Stations
Part-time, nights, weekends - Call recorded info line for FREE video
1-800/295-4433 **www.radioconnection.com**

See our ad in Marketplace pg. 198

See our ad in Marketplace pg. 198

INDIE MUSIC CDs FOR SALE

Robert Bitte; Autumn Moon
Instrumental smooth jazz/new age. Music for the Age of Anxiety. CD $15 www.cdbaby.com/bitte

Myles Boisen; Scrambledisc
A masterpiece of studio cutups and improvisation. Audio CD $15 mylesaudio@aol.com

Barely Breathing 2 CD's
Rated Five Stars. Jeff Beck meets Steely Dan. One CD $12/both$20 E-mail tabeloop@aol.com to buy.

Gino Robair; Singular Pleasures
Industrial Percussion Solo Performance CD $10. Audio Format www.rastascan.com/brd023.html

Robert Ceely: BEEP CITY
Instrumental & Electronic Music Hear what you're missing. CD $16 www.ceelymusic.com

Benny Rietveld; Mystery of Faith
Alt Jazz/Rock by Miles Davis/Santana bassist. $15 w/Carlos Santana, Barbara Higbie. www.bennyworld.com

Modus;The Twin Jade Sessions
Ground-breaking improv funk jazz from S.F.,CA. Check out samples atwww.cdbaby.com/modus

Lakeside Rebar: Lost at Shore
Debut album from San Francisco's finest avante-garage roots-pop band www.lakesiderebar.com

See our ad in Marketplace pg. 196

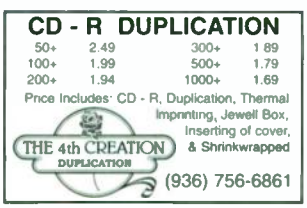
See our ad in Marketplace pg. 199

RECORDS, TAPES & CDS

MUSIC PRODUCTION

PARTS & ACCESSORIES

RECORDING SERVICES & REPAIRS



****A great deal!****
Real-time cassettes—Nakamichi decks, chrome tapes—the best! Album length $1.50/100. On-cass. printing/inserts avail. Grenadier, 10 Parkwood Ave., Rochester, NY 14620. (716) 442-6209 eves.

EM CLASSIFIEDS

RECORDS, TAPES & CDS

all under one roof!
deal direct & SAVE
FREE CATALOG or CUSTOM QUOTE
Compact Disc Replication • Cassette Duplication • Complete Packages • Digital Mastering • Graphics and Printing
C&C MUSIC
You'll Hear & Feel the Difference
www.CandCmusic.com
OUTSIDE THE U.S. CALL: 631-244-0800
Toll Free: 800 ★ 289 ★ 9155

CD-R • CD-ROM • CD-R • SHAPED CDs • AUDIO CASSETTES
CRYSTALCLEAR
DISC & TAPE
1-800-880-0073 www.crystalclearcds.com
DIGITAL MASTERING • ART DESIGN • PRINTING • PACKAGING
See our ad in Marketplace pg. 198

1,000 Store Ready CDs - $999
1,000 Bulk CDs - $490
www.TrackmasterAV.com
Toll Free: 888-374-8877
CASSETTES
GRAPHIC DESIGN & POSTERS
STUDIO MASTERING
CD-R MEDIA
YOUR 1-STOP SHOP FOR CD, AUDIO & VIDEO CASSETTE PROJECTS!

EST 1967 "IF IT'S RECORDABLE WE HAVE IT" EST 1967
FOR EASY SECURE ORDERING
800-221-6578
www.andol.com
RECORDING AND DUPLICATING SUPPLIES
SONY • BASF EMTEC • MAXELL
TDK • QUANTEGY • MICROBOARDS
MEDIAFORM • PRINCO
ANDOL
AUDIO PRODUCTS INC.
16X BLANK CD'S CALL FOR BEST PRICE.
CUSTOM LOADED AUDIO CASSETTES AVAILABLE FROM 1 MIN TO 126 MIN

1000 CD's in full color cardboard sleeves!
$1049.00

5000 3.5"x5.5" POSTCARDS in full color
$250.00
888-DISC-MFG
1000 CDs $0.62 ea.
compact discs
cassettes
posters
postcards
cd-r media
TGS
www.tgsdisc.com
Get an online quote or a free catalog!

Whitney Houston • Jennifer Lopez • Bob Dylan • Alice In Chains
When a leading Digital Rights Management company needed someone they could trust to handle top artist's internet material, they chose Eastco as one of their Preferred Service Partners.
You can choose Eastco to handle your projects too.
1000 CD's - $599 3 Color Silk-screen Both on spindle
100 CD's - $369 Full Color Insert, Traycard, Direct-on-Disc Imprint, Jewelbox, Shrinkwrap
• Business Card CD's, Shaped CD's • On demand short-run color printing
• Audio/Video Cassette Duplication • WWW Development & Encoding
• A/V Mastering/Digital Editing • Design/Printing/Packaging
1-800-365-8273
EASTCO PRO MEDIA CORPORATION
Serving the world since 1985
www.eastcopro.com
Disney • Warner Home Video • Sony Music Entertainment Inc.

AMERICA'S BEST CD PACKAGES HANDS DOWN
1000 Retail Ready CD's Only $1399
100 Retail Ready CD's Only $299
800-367-1084
www.electricdisc.com
ELECTRIC Records

FREE DESIGN
RETAIL READY CDs
FILM-GRAPHIC DESIGN
MANUFACTURING
MAJOR LABEL QUALITY
FULL COLOR FRONT/BACK
4 PAGE INSERT COLOR/B&W
2 COLOR ON DISC
SHRINK WRAPPED BAR CODE
IN-HOUSE GRAPHIC DESIGN
using your files / images / photos
ONE PRICE
ALL INCLUDED
1000 @ $1250 ~ 500 @ $925
DESIGN & DUPLICATION SINCE 1983
CHECK YOUR PRODUCTS @
dbsduplication.com
DEAL DIRECT @ 888-565-8882

In the Studio?
FREE Guide
Saves You Time and Money!
Contact Us Today:
1-800-468-9353
www.discmakers.com
Info@discmakers.com
DISC MAKERS

1000 Bulk CDs $620
MEDIA SERVICES
1.888.891.9091
See our ad in Marketplace pg. 197

www.gvrjr.com
Good Vibrations-RJR Digital
800-828-6537
"Simply the best prices and service for CD Replication, Duplication and Design!"
SINCE 1976

500 CDs and Jewel Boxes for $650.00
QCA 800-859-8401
Great prices on complete packages w/ printing, graphic design & mastering
www.go-QCA.com

EARTH DISC
YOUR NEXT REPLICATION OF 500 CDS COULD BE FREE
800-876-5950
www.earthdisc.com
See our ad in Marketplace pg. 198

Lowest Price Period!

- CD, CD Rom, DVD, cassette & video manufacturing
- Graphic design & print production
- Customized packaging solutions
- Low run capability

DISC MANUFACTURING

1-888-256-DISC ballmedia.com

CD-R COPIES
Lowest Prices
48 Hr. Turn Aound!
1-800-927-3472
check out our internet specials!
www.elsproductions.com

Uptown Recording Studio
Need CD's in a hurry?
1-500 CD-R's, 1 day turnaround
Includes CD-R, jewel case &
CD imprinting./Great Prices!!!
http://uptownrecordingstudio.com
(877) 381-CDRs MC/Visa Accepted

MAJOR LABEL QUALITY!
1,000 CD's $590!
1,000 CD Business Cards $950
WE SPECIALIZE IN RUSH ORDERS!
1-888-691-3150
NOVA MUSIC
THE MUSIC INDUSTRY RESOURCE CENTER
www.novamusic.com

Get The Best Session Players Performing LIVE With You
For LESS
Than You Spend On Beer !!!

Real Guitars - Real Drums
Live Vocals - Hot Horns & Strings

Digitally Mastered LIVE Musicians With NONE Of The Attitude

- All The Songs In All The Styles -
Rock / Pop / Country / Standards
Old / New

More Gigs - Better Gigs
More Money !!

VSPLive™
www.vsplive.net - 859-543-8677

HEY LOOK! WE'RE ON THE WEB!
Toll Free: 800-538-2336
NRS National Recording Supplies Inc.
All Formats! Best Prices!
www.tapes.com

Got Fat Sound?
Analogmastering.com
(800) 884-2576

CD duplication
Guaranteed | Reliable | Highest Quality!
.59 each! Bulk CDs
1000 for $590
100 CD Retail Ready Promo Package $379
Call Toll Free 888-673-2615
877.591.6000
www.newenglandcd.com
New England Compact Disc
A Division of New England Digital Media, Inc.

MEDIAWORKS INTERNATIONAL, INC.
1029 Elm Hill Pike
Nashville, TN 37210
compact discs cd rom dvd
cd +/cd enhanced video
digital bin cassette duplication
short-run discs and cd one-offs now available
call toll free for quotes, special packages and large quantities
•competitive pricing
•friendly service
•professional results
1-800-211-4689
www.mediaworkscd.com
SPECIAL PACKAGE PRICE
1000 CDs for $1545
both include graphics, film, print, duplication, packaging
Retail Ready! 4 page color!

We do your duplication right!
1000 CDs for $1199.00
includes one color print on disc, jewel case, 4/0 insertion 4/0 tray, FREE barcode, poly!
500 CDs for $625.00
includes one color print on disc, jewel case.
Get it right the first time!
Call Click Productions now..
Call for your free catalog!
1-888-738-2573 toll free
www.eclickpro.com

PATCHMAN MUSIC
Now in our 17th year
Over 782 Pro Soundbanks!
Akai S5000/6000 Owners!
Introducing The...
Studio Series-MegaPiano
CD ROM for Akai S5000/6000
Steinway® Grand Piano
Loop-free! w/Key Releases!
48 banks from 16-240 megs!
Reg $195. Order now for $145
(216) 221-8282
matteblack@aol.com
www.patchmanmusic.com

SPECTRUM'S
FastTrack
Full Color CDs...
From your CD or DAT master
Mix Special GET 25 FREE CDs w/EVERY 100 ORDERED
100 CD's Full Color only $595 complete
AUDIO CDs
CD ROMS
AUDIO TAPES
INCLUDES:
- Full color one side front insert card
- Matching color tray card with color photo
- Fast Track layout and design
- One color black print on disc
- Jewel case and wrap

Spectrum MANUFACTURING
1.800.334.9328
Fast Track Digital Chrome Cassettes
100 $445 GET 25 FREE w/EVERY 100 ORDERED

SOFTWARE, SEQUENCES & SOUNDS

COMPUTER MUSIC PRODUCTS
Beginners Welcome! Sound card MIDI cables, MIDI & Audio software, hardware & accessories. Online catalog & MIDI Tutorials:
www.musicmall.com/cmp

BAND-IN-A-BOX IMPROVEMENT PRODUCTS***You can put a Better-Band-In-Your-Box. Power-User Styles, Fake Disks & More! GenMIDI **SEQUENCE** & CD-ROMs, too! **FREE** info! Norton Music & Fun, Box 13149, Ft. Pierce, FL 34979. Voice mail/fax (561) 467-2420. www.nortonmusic.com

WORLD CLASS MIDI FILES
the WORKS Music Productions
For **Free Catalog & Demo Disk**
call **(800) 531-5868** or visit
our Web site: **www.worksmidi.com**
Popular styles, General MIDI compatible, e-mail delivery avail.
Box 22681, Milwaukie, OR 97269

Music Tools Blowout!
Great Deals & Service
Software, Sound Cards, Interfaces, Cables, Controllers, Samples, Sequences, Books, Videos
Shop for over 12,000 products at
www.midi-classics.com
Call 800-787-6434 NOW!
MIDI Classics, Dept.E, Box 311, Weatogue, CT 06089

FREE SOUNDS!
@
eSoundz.com
Music Software Professional CD ROM Sample Libraries
Bitheadz Wizoo BITR Sonic Reality/Bio Propellerhead

E-mail your ad to emclass@primediabusiness.com

EM CLASSIFIEDS

SOFTWARE, SEQUENCES & SOUNDS

Extreme High Quality Giga Sampler Instruments!
www.BardstownAudio.com
800-814-0820 502-349-1589
Bardstown Audio
Bardstown, Kentucky 40004

SUPA DOPE SOUNDS!
Floppy disk, audio cd, cd-rom, zip disk
Akai MPC, S-1000, EPS-ASR-TS
Roland S-50, S330, DJ-70
ph: 800 301-MIDI
fax 562 698-7188
www.midimark.com
MIDI MARK

KID NEPRO
Quality Samples & Patches For 100s of Synths & Samplers
ROLAND YAMAHA AKAI KORG EMU CASIO KAWAI ENSONIQ KURZWEIL OBERHEIM SEQUENTIAL
Since 1984
The Best Sounds @ The Best Prices
VIEW OUR CATALOG & ORDER ONLINE AT:
WWW.KIDNEPRO.COM
KID NEPRO PRODUCTIONS
TEL:(246) 420-4504
E-MAIL: KIDNEPRO@AOL.COM

CD Looper Pro
Now Just $49.99!
Slow down anything & keep the pitch: MP3, CDs, Wav, Berlitz language CDs...
RePlay Technologies, Inc.
888-3Replay www.replayinc.com

Here's where the PRO's Come For Their Tracks...!
Over 6,000 backing tracks with that "off-the-record" feel.
Pop - Oldies - Jazz
Country - Standards
Swing - Latin - Blues
Big Bands - Dance
Midi Hits
1010 S. Riverside Dr
New Smyrna Beach, FL 32168
www.midi-hits.com
(800) 593-1228
Int'l (904) 426-1263 Fax (904) 426-8928

SAMPLE CD-ROMS
Floppies
128 Meg
Orchestral · World · Drums
Guitars · Pianos · Vocals · FX
Akai·Emu·Kurzweil·Roland·Digidesign
CD-ROMS·Floppies·Emax·SP1200
Productions
www.northstarsamples.com
13716 SE Ramona·Portland, OR 97236
Tel:(503)760-7777· Fax:(503)760-4342

Hi-end Audio Drum Loop CDs All Styles
Killer Groove King Cortez Loops
Now you can have Groove Master session drummer bad boy—Jody Cortez on all your tracks.
Great Testimonials
Awesome Credits & Resume
Great Prices!
Free Samples
www.jodycortez.com

Nightingale
New! Version 4.5
Music Notation Software for Macs
Bird Lives!
Nightingale "is deep yet easy to learn" and "is one of the biggest bargains in music-notation software."(EM-9/01) Now more features than ever. Download our freeware NightLight today.
Adept Music Notation Solutions, Inc.
www.ngale.com; info@ngale.com; 1(215)736-8237

TALENT AGENCIES

"LOOKING FOR A RECORD DEAL???"
Getting signed is very hard to do. But we will get the record deal you are looking for! Guaranteed Service.
Call now to receive your FREE information
TALENT 2000
1-800-499-6395

TRAN TRACKS
MIDI SEQUENCES
Over 6000 high-quality Standard MIDI files
All Styles of music
Toll-free order line 800 473-0797
24-hour **Immediate Email Delivery** from our website!
www.trantracks.com
Tech and info 973 383-6691

Sell Your Music!

Attention bands and musicians:
Are you an individual or band with self-released music for sale?
Now you can run an EM classified for $35 and sell your music to over 72,000 readers!

MUSIC FOR SALE

Myles Boisen; Scrambledisc
A masterpiece of studio cutups and improvisation. Audio CD $15
mylesaudio@aol.com

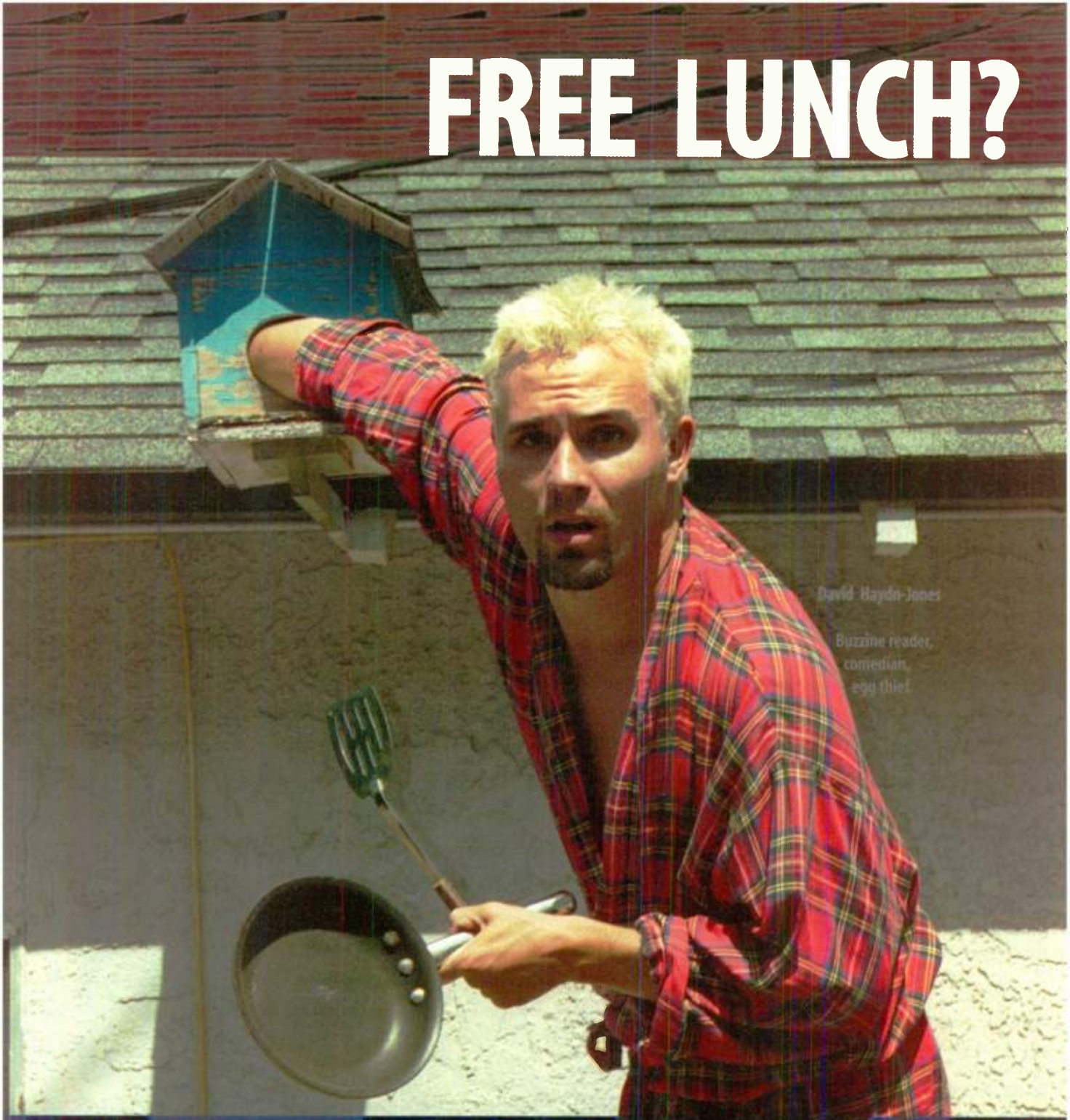
Gino Robair; Singular Pleasures
Industrial Percussion Solo Performance CD $10. Audio Format
www.rastascan.com/brd023.html

Benny Rietveld; Mystery of Faith
Alt Jazz/Rock by Miles Davis/Santana bassist. $15 w/Carlos Santana, Barbara Higbie. www.bennyworld.com

$35 includes

- Four lines of text. No borders, boxes or colors can be used at this rate. 27-32 character spaces per line, including band name in **bold**.
- This rate only available for self-released music.
- No additional copy allowable at this rate.
- Must run a minimum of three issues in a row.
- prepayment is required by credit card or check.

FREE LUNCH?



Buzzine Magazine

Same original music and entertainment magazine. Great new print format. Best of all, you can get it FREE !

For a limited time only, you can get your free lunch by having Buzzine Magazine delivered directly to your door at absolutely no charge. So what's the catch? There is none. Simply visit www.buzzine.com/freelunch and tell us where you'd like your free copies sent -- We'll take care of the rest.

For more information, contact Steph Rose at srose@buzzine.com

Buzzine is a Stipko Media company.

www.stipko.com

No money. No credit card info. No strings. No kidding.

And while you're there, be sure and check out the rest of the Buzzine.com web site for a preview of the great things to come. Need a celebrity fix? Try surfing our favorite *"succes d'estime"* web site: www.safesearching.com

WRH

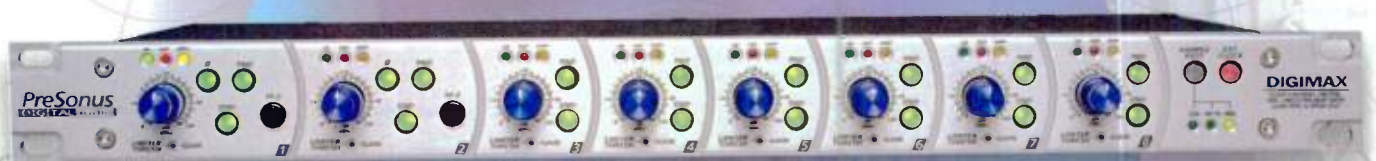
Build Your MOTU Dream Studio

GLYPH TECHNOLOGIES, INC. MAS STOR® High performance drives & backup

Glyph Technologies is the undisputed leader in storage solutions for audio. Now Glyph partners with MOTU to bring you the absolute latest in high-performance storage technology: MAS STOR is a two-rack high, two-bay, removable-drive storage solution that provides enough massive throughput to support even the most demanding multitrack recording environments. MAS STOR is the ONLY drive you'll want to use for multitrack 96kHz projects recorded with the MOTU 1296 audio interface. Configure a system that's perfect for you with the following removable drive components: 15,000 RPM 18GB Ultra3 SCSI drive, VXA 33GB backup tape drive and/or a Plextor 12x redbook compliant CD burner, all backed by Glyph's legendary service and support.

PreSonus DigiMax® Pristine mic pre-amplification for the MOTU 2408 audio interface

Why is the PreSonus DigiMax perfect for your MOTU rig? Because it's the purest path to digital. DigiMax combines 8 channels of award winning 24-bit mic pre-amplification with our unique simultaneous RMS/peak detection limiting and EQ enhancement, giving you maximum gain before clipping while maintaining the musical transparency of a compressor. The result? Fast, natural and versatile limiting on every channel. And DigiMax connects all 8 channels via ADAT optical to your MOTU 2408 system in pristine, 24-bit digital glory. And you can expand: add up to 3 DigiMax's to your 2408.



bias Peak 2.6 VST

Advanced waveform editing and mastering

BIAS Peak 2.6 VST is the ultimate editing and mastering companion for Digital Performer! Peak gives you lightning fast, nondestructive waveform editing with support for audio files up to 32 bits and 10 MHz, including 24-bit/96kHz files. Unlimited Undo/Redo with independent edit histories for each audio document gives you the freedom to work creatively. Select an audio region in Digital Performer, choose the "Use External Waveform Editor" command, and instantly switch into Peak! Peak's sophisticated options for on-the-fly marker, region and loop creation are simply unparalleled. Advanced looping tools include Loop Tuner™, Loop Surfer™, Loop It™ and Guess Tempo™. Process thousands of files—or just a few—using Peak's batch processor. Peak directly supports the 2408mkII and all other MOTU audio interfaces and includes Toast™ CD burning software for making your own redbook audio CDs directly from Peak's powerful playlists. Or create web or multimedia content and export to Shockwave, RealAudio, MP3 and other formats.

CM Labs MotorMix™

Hands-on automated mixing

With its new, custom software written specially for Digital Performer, MotorMix becomes a seamless, tactile extension of your MOTU software recording environment. Put your hands on eight 100mm motorized faders and rotary encoders to tweak your mixes in record time. Gain instant easy access to all MIDI and audio tracks with control banks. You'll never even think about mixing with a mouse again. Imagine having tactile control over most of Digital Performer's features with MotorMix's intuitive layout and easy operation. MotorMix gives you all the advantages of a professional mixing board, at an incredibly affordable price. Bring motorized mixing to your MOTU desktop today. For more info, visit cmlabs.net or contact your Sweetwater sales engineer today to enter the future of mixing.

order yours today

Sweetwater
music technology direct.

WRH

Start here

G4 Power Mac
Such as a G4 / 733 dual processor desktop

MOTU DP3 — now shipping!
Award-winning audio workstation software

MOTU Hard Disk Recording System
Such as the 2408mkII , 1296 or 828 FireWire

WAVES Gold Native™

It's all new: Version 3 for MAS!

Waves is the industry standard, and Version 3 Gold Native includes the entire line of Waves native plug-ins, including the C4 Multiband Parametric Processor and new Renaissance Reverberator! Waves Gold Native is the ultimate package with everything you need—from daily tools, to sweetening and mastering processors, to sound design mind benders. From the original Q10 and L1, to the Renaissance series, to Enigma and MondoMod. Don't skimp. Go for the Waves Gold, on the way to your Gold record...

NATIVE INSTRUMENTS Absynth™

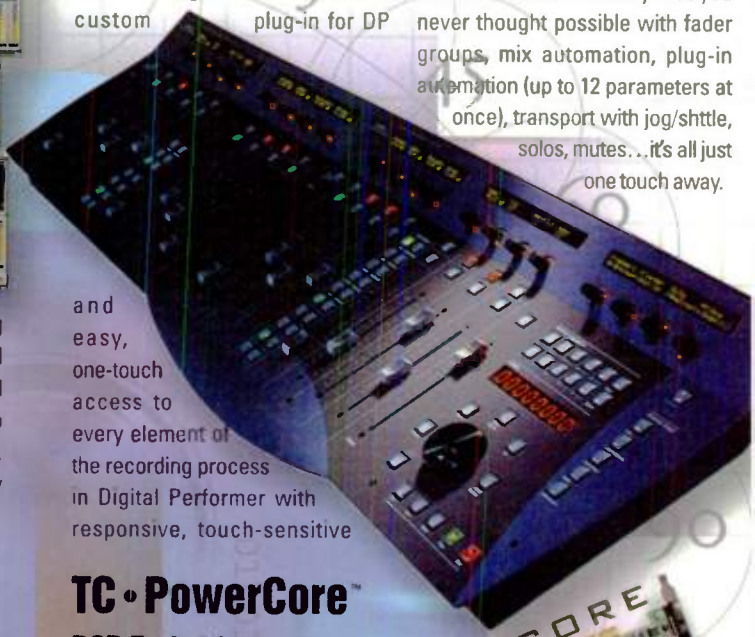
Feed your addiction to sound...

ABSYNTH, new from Native Instruments, is the benchmark for the future of soft-synths. The powerful semi-modular architecture and clean interface let you effortlessly sculpt everything from organic textures to rhythmic madness, from time-evolving soundscapes to vintage sounds. ABSYNTH's unique strengths lie in its multiple synthesis techniques combined with the most flexible envelope control ever. To get a taste of ABSYNTH's potency, try drawing the shape of your LFO with the mouse while twelve rhythmic envelopes twist your sound. Absynth is surprisingly efficient, giving you plenty of leftover bandwidth for mixing and processing. And Absynth feeds directly into your MOTU mixing environment for seamless operation.

SAC-2K™ controller

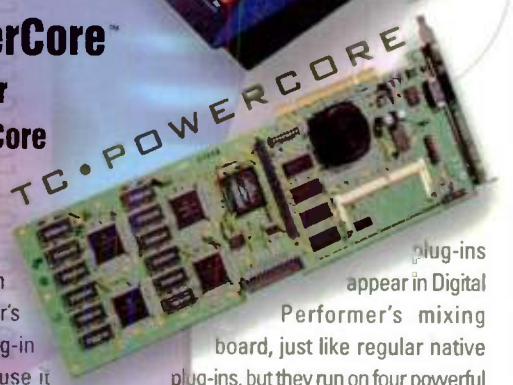
Precision touch-sensitive automated worksurface

The Radikal Technologies SAC-2K sets a new standard for hands-on control of Digital Performer with a custom plug-in for DP and easy, one-touch access to every element of the recording process in Digital Performer with responsive, touch-sensitive automated controls. Within minutes, you'll achieve a whole new level of interaction and creativity that you never thought possible with fader groups, mix automation, plug-in automation (up to 12 parameters at once), transport with jog/shttle, solos, mutes...it's all just one touch away.



TC • PowerCore™

DSP Turbo™ for MAS • PowerCore Plug-ins



TC•PowerCore is a major breakthrough for Digital Performer's real-time MAS plug-in environment because it provides DSP turbocharged plug-in processing. At last, the renowned TC TOOLS/96 studio-quality FX package (included), with TC MEGAVERB, TC Chorus/DELAY and TC EQ™, can be at your fingertips in Digital Performer, plus other TC | Works plug-ins such as TC MasterX and TC Voice Tools (sold separately). These powerful plug-ins appear in Digital Performer's mixing board, just like regular native plug-ins, but they run on four powerful 56K DSP chips on the TC•PowerCore PCI card. It's like adding four G4 processors (equal to 2.8 gigahertz of extra processing power!) to your computer. Run 12 studio-quality TC plug-ins with no hit on your CPU power, and run other native plug-ins at the same time! TC•PowerCore is an open platform, so it will also run plug-ins from other respected 3rd party developers, too (details TBA).

TC | WORKS

www.sweetwater.com
Voice (219) 432-8176 • Fax (219) 432-1758 • Email: sales@sweetwater.com
5335 Bass Road • Fort Wayne, IN 46808
800-222-4700

FINAL MIX

By Larry the O

The Art of Being Wrong

Everyone makes mistakes. That humbling thought is one reason I work with music and sound and don't have a job involving life-or-death responsibility. I knew a guy whose job was regulating the oxygen that divers received; a mistake on his part could have had dire consequences I'd rather not ponder.

Even when lives are not in the balance, a mistake made working on a client's project can have unpleasant results. (A mistake made on your own project is a problem, to be sure, but at least it's just your problem.) Depending on the severity and obviousness of the mistake, the fallout can range from shaken confidence to months of work destroyed ("Erase hard disk? Y/N").

So you know you'll make some mistakes, and that won't be good. Wonderful. How are you going to handle one when it happens?

A strong start is to do everything you can to avoid setting up situations in which mistakes can occur and to provide ways to recover from those that do. Plan in advance, confirm assumptions, document things assiduously, back up data religiously, save multiple versions of work in progress, double-check before committing to anything from which it would be difficult to backtrack, and most important, draw on knowledge of past problems to anticipate things that can go wrong.

Doing that much can actually protect you pretty well against many cataclysmic blunders—but sooner or later, something will go wrong anyway. That isn't fatalism, just a fact of life.

All right, so you made a mistake. Now what? Several responses are possible, and proceeding from there requires an important and sensitive judgment call as to which is appropriate.

Assess the severity of the damage: if you accidentally overwrote a console snapshot that contained a 0.5 dB EQ tweak on one track with a snapshot that's otherwise identical, it's possible the difference is so small that it's not even noticeable. (You may have made an unnecessary perfectionist tweak to start with.) If neither the client nor you notice the error, it might be best to just let it go.

Perhaps you can quickly and easily repair the mistake. In that instance, it is often possible to fix it without even letting the client know a problem occurred. I once witnessed an excellent engineer who was working on a major TV series accidentally fly an instrument to the wrong track, wiping the last bit he'd dubbed over. The client was engaged in conversation, and it was easy to re-create the earlier edit and then correctly execute the later one. It was done in minutes, and the client never knew—or needed to know.

But some mistakes matter and can't be covered up. That leaves only one option: give it to the client straight. As risky as it is making a decision not to mention a problem, lying about it is far dicier. If the lie doesn't work, the water can quickly get very deep.

On the other hand, if you concisely present the problem to the client in a calm, composed manner, what options (if any) exist for remedying it, and the cost in time and money of each possible solution, most clients will take it in stride and still feel the situation is under control in your hands. They won't be happy, but it may not precipitate a serious breach in the relationship or project.

Many times it is perfectly acceptable, after explaining the situation, to send the client away while you deal with things. That can help preserve the client's creative state of mind and momentum while sparing him or her from the concern that can arise watching a messy repair. If the mistake was serious, you might even have to end the session for the day, but even that can still be okay if the client comes in for the next session and everything has been fixed.

In the end, it is simply unavoidable that, to paraphrase a popular expression, excrement occurs. When it does, only two things really matter: your cleanup skills and your diplomatic chops. ❁

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

STEVE CURL

Customers and reviewers say:

"WaveCenter/PCI was a snap to install, and I appreciate the included Cool Edit Pro SE software. A very fine product at a great price."

"Tango24 provides accurate, robust, well-defined and clean recording. It captures the body and essence of the instruments it is recording. This is a very fine sounding and well-designed recording system."

"WaveCenter/PCI has been trouble-free and robust. Tango24 sounds superb, to my ears. Even older 16-bit mixes are sounding more detailed and alive."

WaveCenter/PCI:

8 channels ADAT optical I/O.
Stereo coax/optical SPDIF I/O.
Built-in MIDI (2-in, 2-out).
GigaSampler & ASIO drivers.
Easy plug-and-play installation.
Windows & Macintosh support.
Includes Cool Edit Pro SE.
Patchbay for input monitoring.

Tango24:

Professional 24-bit A/D & D/A.
Optically-isolated converters.
Balanced analog I/O (8-in, 8-out).
ADAT optical in/thru/out.
BNC word clock connectors.
Switchable +4dBu/-10dBV levels.

Buy a Bundle

Save a Bundle

WaveCenter/PCI + Tango24 bundles are now available at fantastic prices.

FRONTIER DESIGN GROUP

1·800·928·3236
www.frontierdesign.com

What's better than one 828?

two 828's

Each MOTU 828 FireWire audio interface gives your computer 18 channels of input and output: 8 analog (with two mic preamps), 8 ADAT optical and 2 S/PDIF. And with the 828's new Version 2 driver, you can now connect multiple 828's to your FireWire-equipped computer. Connecting two 828's gives you 36 simultaneous inputs and outputs, all without a PCI or PC card. And at $795, expanding your 828 system is easy and affordable: just plug them in and go.

KEYBOARD KB AWARD KEYBUY

Mac OS

Windows

MOTU, Inc. • 1280 Massachusetts Avenue • Cambridge MA 02138 • 617 576 276_ • 617 576 3609 fax • www.motu.com
All trademarks are property of their respective owners.