LIVE SOUND SUMMER SPECIAL

EQ

THE PROJECT RECORDING & SOUND MAGAZINE

JULY 1996

REVIEWS

- CREST CONSOLE
- QSC 4.0 AMP
- BSS DYNAMIC EQ
- TECHNOMAD PA
- MANLEY COMP/LIM
- PANASONIC DAT
- MIDISOFT STUDIO
- WHIRLWIND MIC ELIMINATOR

PLAYING THE CLUBS

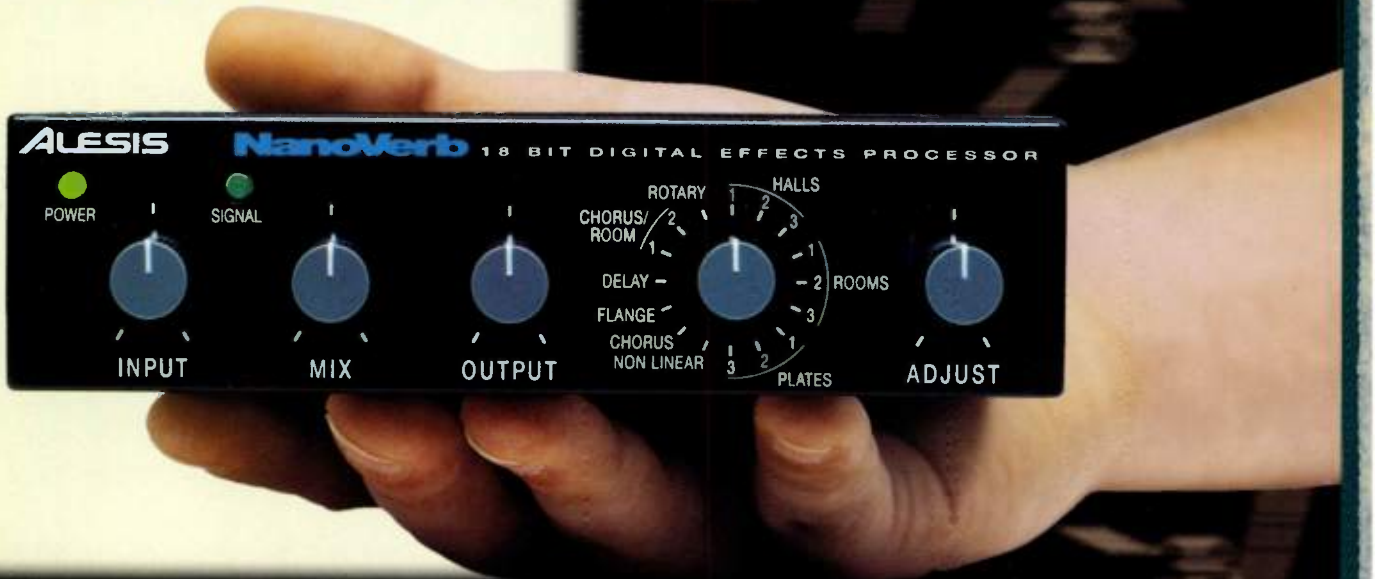
PRIMUS & NEVILLE BROS ON TOUR

Les Claypool of Primus

***************** 3-DIGIT 500
EQ 0112336
RON CARLSON
ZOOM TAPES-PRODUCTIONS
103 TAMA ST
BOONE IA 50036-3616

USA $3.95 • Can. $4.95 • U.K. £2.95 • Issue #7

Actual Size


ALESIS
NanoVerb 18 BIT DIGITAL EFFECTS PROCESSOR
POWER
SIGNAL
INPUT
MIX
OUTPUT
ROTARY
HALLS
CHORUS/ ROOM
DELAY
ROOMS
FLANGE
CHORUS
NON LINEAR
PLATES
ADJUST

Actual Price

$179

Introducing the new Alesis NanoVerb™ **18 Bit Digital Effects Processor.**

We packed sixteen of the best sounding, most usable effects into a compact, one-third rack space package.

NanoVerb offers lush reverbs, powerful delay, shimmering chorus and flange, stunning rotary speaker simulation and big, fat multieffects.

Plus, you can tweak each program to perfection with the front-panel Adjust knob.

Oh yeah...NanoVerb costs $179*, so it's actually the most affordable Alesis digital effects processor ever made.

To get *your* hands on a NanoVerb, see your Authorized Alesis Dealer today.

For more information about NanoVerb, see your Authorized Alesis Dealer or call 310-841-2272
*U.S. Suggested retail. NanoVerb is a trademark of Alesis Corporation

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016 310-841-2272 alecorp@alesis1.usa.com

ALESIS

CIRCLE 03 ON FREE INFO CARD

Paranormal EQ

It's uncanny.

The precision and sheer musicality of Ghost's EQ will take your breath away.

Drawing on 22 years of Soundcraft experience, Ghost's new EQ is perfectly in tune with today's music.

Two fully parametric, overlapping mid bands with shelving high and low filters redefine the classic British EQ.

But there's much more.

Each channel strip benefits from its own dedicated circuit board and supports both the main input plus a mix B path for tape or other input signals.

Ghost's flexibility and fidelity are staggering.

The signal path quiet, true and uncompromised.

And the automated mutes, just part of Ghost's comprehensive machine control and MIDI implementation, don't so much cut, as fade very quickly. There are no thumps and no clicks.

Ghost's microphone preamplifier, ProMic, boasts a better gain to noise performance than you'd expect on consoles costing many times more.

We could go on, but to appreciate fully the ergonomic and audio integrity of Ghost you need to see and hear one in the flesh.

So call 818 227 1800 to find out more.

CIRCLE 60 ON FREE INFO CARD

Soundcraft

Ghost

A Harman International Company

HARMAN INTERNATIONAL INDUSTRIES LTD., CRANBORNE HOUSE, CRANBORNE RD., POTTERS BAR,
HERTS. EN6 3JN. ENGLAND. TEL: +44 (0)1707 665000 FAX: +44 (0)1707 660482
SOUNDCRAFT USA. 8500 BALBOA BLVD. NORTHRIDGE. CA 91329. TEL: 818 227 1800 FAX: 818 884 2974

PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 7, ISSUE 7
JULY 1996

ON THE COVER: *Primus front-man Les Claypool. Photo by Steve Jennings. Illustration by Melissa Halka*

THE THIRD ANNUAL SUMMER OF LIVE

Once again, EQ LIVE takes a look at the busy season for live-sound engineers. Stories include:

PRIMUS: TALES FROM THE FOH *By Robert Granger*......60
Primus, in support of their album *Tales from the Punchbowl,* scales their rig down for the final leg of their world tour. Long-time Primus engineer Derek Featherstone reveals some of his sound-reinforcement secrets.

THE NEVILLE BROTHERS LIVE AT MARDI GRAS *By David Norman*......64
When the Neville Bothers perform on a balcony above a Mardi Gras parade route, the live-sound logistics become a nightmare.

THE INS & OUTS OF VCAS *By Greg Price*......68
Greg Price takes time out of his busy touring schedule to dole out tips on getting better live sound by effectively using subgroups and VCAs.

CLUB PROFILE: THE WEBSTER THEATER *By Gary Scott Peck*......74
Is this Hartford, CT venue a club or a theater? Peck, the house systems engineer, explains the setup of this Northeastern hot spot.

NEW GEAR FOR YOUR NEXT GIG......78

FIRST LOOK: A LOOK AT LIVE SOUND'S NEWEST GEAR *By Steve La Cerra*......80
- **MACKIE SR40•8 CONSOLE**......80
- **ALLEN & HEATH GL2000 CONSOLE**......84
- **JBL EON KEYBOARD15**......86
- **SAMSON WIRELESS SYSTEM**......88

ROAD TESTS: LIVE GEAR IN REVIEW

- **CREST AUDIO CENTURY VX MIXING CONSOLE** *By Wade McGregor*......90
- **QSC POWERLIGHT 4.0 AMPLIFIER** *By Wade McGregor*......94
- **BSS DPR-901 II DYNAMIC EQ** *By Craig Anderton*......98
- **TECHNOMAD NOHO C LOUDSPEAKERS** *By Wade McGregor*......102
- **WHIRLWIND MIC ELIMINATOR** *By Wade McGregor*......106

TECHNIQUES

POWER MANAGEMENT IN THE STUDIO *By Roger Nichols*......38
NIGHTMARE ON VINTAGE STREET *By Bennet Spielvogel*......46
SOUL COUGHING'S SAMPLING MAN *By Mark De Gli Antoni*......50
MAINTAINING YOUR COOL IN THE STUDIO *By Tay Hoyle, Penny Mealing, and Charlie Hoyle*......54

COLUMNS/DEPARTMENTS

MI INSIDER: 10 TIPS FOR GUITAR MULTIEFFECTS *By Craig Anderton*......34
MAINTENANCE: WANTED: DEAD OR ALIVE *By Eddie Ciletti*......130
ACROSS THE BOARD: MISSING THE GOOD 'OL DAYS *By Roger Nichols*......146

EDITORIAL......6
LETTERS TO EQ......8
EQ&A......12
PRODUCT VIEWS......18
STUDIOWARE......24
ROOM WITH A VU: RIGHT COAST RECORDING......28
MICROPHILE: SONY C-48......30
IN REVIEW: PANASONIC SV-3800 DAT......110
IN REVIEW: MIDISOFT STUDIO 4.0......114
IN REVIEW: MANLEY VARIABLE-MU COMP/LIM......118
REVIEW SHORT: KEYFAX TWIDDLY.BITS......122
AD INDEX......115

EQ (ISSN 1050-7868) is published monthly by Miller Freeman PSN Inc., 460 Park Ave South, 9th fl., New York, NY 10016-7315. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. 1 yr. $24.95, 2 yrs $39.95, 3 yrs $59.95; CANADA add $10.00 per year for surface; other countries add $15.00

t.c. electronic
M2000
M2000 Hall
124
Wide Stereo Chorus
SETUP
ROUTING
LEVELS

Magic

for your ears

You will love the Wizard M2000. This digital multi-effects processor is specifically designed for the artist within you. Based on the unequaled DARC™ chip, the two independent engines deliver uncompromising effects, meeting the high performance demands of your ears. The clarity, density and feel is beyond anything you have ever experienced before. It will lift your music to the highest quality level.

We realize that you are busy creating music. TC's engineers are artists themselves, and have therefore gone to great lengths to make the M2000 intuitive and easy to operate. For example, with the 'Wizard' function you can find the best presets in any given situation; and all parameters are maximum one menu level away - no more searching through multiple menu levels.

M2000 - Combine your artistic skills with science and create magic.

Please also refer to the brochure included with this issue of EQ.
For information about your nearest TC dealer, please call 1-800-798-4546.

Wizard | M2000
Art + Science = Magic

t.c. electronic
ULTIMATE SOUND MACHINES

CIRCLE 76 ON FREE INFO CARD

TC Electronic Inc., 705-A Lakefield Road, Westlake Village, CA 91361 Phone: (805) 373-1828 Fax :(805) 379-2648 Email: usinfo@tcelectronic.com WWW: http://www.tcelectronic.com

EQ

A Miller Freeman PSN Publication
Vol. 7, No. 7
July 1996

PAUL G. GALLO
Publisher

KATHLEEN MACKAY
Associate Publisher

TIM WETMORE
Editorial Director

HECTOR LA TORRE
Executive Director

MARTIN PORTER
Executive Editor

ANTHONY SAVONA
Managing Editor

CRAIG ANDERTON
Technology Editor

STEVE LA CERRA
Senior Editor

LIANA JONAS
Associate Editor

ROBERT GRANGER
Assistant Editor

DAVID MILES HUBER, EDDIE CILETTI, DAVID FRANGIONI, BOB LUDWIG, WADE MCGREGOR, ROGER NICHOLS, MARTIN POLON
Contributing Editors

MP&A EDITORIAL
Editorial/Design Consultants

MATT CHARLES
Sales Manager

ANDREA BERRIE, CHRISTINE CALI, KAREN GODGART, PETE SEIDEL, TARA ESPOSITO
Advertising Sales

AMY HERRION
Marketing Assistant

RIVA DANZIG
Creative Director

MARSHALL MOSELEY
Art Director

MELISSA HALKA
Assistant Art Director

JOY ZACCARIA
Reprint Coordinator

FRED VEGA
Production Manager

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

Administrative/Sales Offices
460 Park Avenue South, 9th Floor
New York, NY 10016-7315
Tel (212) 378-0400, Fax (212) 378-2160

BPA INTERNATIONAL

EQ (ISSN 1050-7868) is published monthly by Miller Freeman PSN Inc., 460 Park Ave S, 9th fl, New York, NY 10016-7315. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. 1 yr $24.95, 2 yrs $39.95, 3 yrs $59.95; CANADA add $10 per yr for surface, other countries add $15 per yr for surface. All add $30 per yr for Airmail. Back issues $5. All product information is subject to change; publisher assumes no responsibility for such changes. All listed model numbers and product names are manufacturers' registered trademarks. Printed in the U.S.A.

Miller Freeman

You Only Live Once

We understand there are many new products that have promise if you know they're there and *when* they can help. It seems there are always new products that hold the promise of having all of the answers...until you try to get something done with them. Then you discover that none of the features made that important transition from the brochure to the box. Certainly that's why *EQ* magazine exists — to bring the technology of live and recorded sound and their underlying issues into focus.

Most people working in the sound-reinforcement industry, whether touring, running a club rig, handling corporate A/V, or volunteering at their church, have learned by doing, and have had very little time and opportunity to exchange ideas with a broader spectrum of people in the industry. A handful of venues for education in live sound do exist, but, unfortunately, most of those are merely adjuncts to a studio recording program. Live sound has already started the inevitable transition to digital technology, but there are relatively few forums for discussing the issues of even this important transition. (Much credit, though, must go to live-sound pioneers Don & Carolyn Davis's Syn-Aud-Con and the *Pro Sound News* Syn-Aud-Con workshops.)

There is nothing as immediate as a live performance, and there are few endeavors more arduous than touring the one-niter. This is a lifestyle that leaves little time for discussing the intricacies of live sound with your peers. Except, that is, for the occasional discussion with another crew member of why the monitors are too loud or the mics are in the wrong place — all while making a 500-mile overnight journey. Wouldn't it be great if you could take a few days and discuss techniques with people as devoted as you are to getting the most out of a system, a venue, and a band?

Everything from loudspeaker rigging to signal processing has been refined over the past decade to meet the very specific needs of live sound. We no longer must use loudspeakers designed for cinema or consoles designed for multitrack recording. Unfortunately, most of us get limited opportunities to use the very latest gear and make up our own minds as to its usefulness. That's why, in addition to reviewing the latest live sound gear in these pages, I have been working to develop a fresh approach to exchanging ideas between working live-sound engineers.

This summer, from August 30 to September 2, some very talented and experienced professionals have been invited to join a limited number of interested individuals for four days of workshops, concerts, and discussions on live sound. This Live Sound Reinforcement Workshop will offer workshops and discussions with: FOH mixer Rob "Cubby" Colby (Phil Collins, Genesis, and presently out with Bob Seger), who will offer his experience in mixing some of the largest tours to ever hit the stage; Kooster McAllister (director and owner, Record Plant Remote) also will be there to discuss the intricacies of interfacing with live recording and how he uses mics to meet the needs of both record companies and live audiences; and fellow *EQ* columnist and digital audio guru, the lovely and talented Mr. Roger Nichols, will relate his experiences in touring with the world's pickiest musicians.

This is the first in a series of workshops set in the idyllic Banff Centre for the Arts in the heart of the Rocky Mountains. In combination with this workshop will be live performances as part of a 12-day international music festival that will allow the participants an opportunity to exchange ideas under concert conditions. We will have some of the latest gear on hand from Panasonic-Ramsa, TC Electronic, dbx, DigiTech, and EAW to try out in concert while exchanging ideas on the hows and whys of live sound, before, during, and after the live shows.

Those interested should contact the Banff Centre for the Arts at 403-762-6180; e-mail: arts_info@banffcentre.ab.ca; and check their web page at http://www.banffcentre.ab.ca. I hope to see some of you there. In the meantime...

Welcome to an issue of *EQ* devoted to the interests of live sound and written by people interested in exchanging information with you. Let us know what you think.

Wade McGregor, Contributing Editor

Focusrite
FOCUS EQ
Mic
Input Trim
+48
Filters

you can't expect...

...engineering this revolutionary,
design & build of this quality...

Focusrite
DUAL MIC PRE
Mic 1
+48
75Hz
O/L
Ext
Mute

sound this clear...

...distortion this low,
bandwidth this wide...

Focusrite
VOICEBOX
Mic
+48
75Hz
Mute
NR

at this price...

...can you?

DUAL MIC PRE **$ 1,099 U.S.***

Two channels of the latest Focusrite microphone preamplifier with +48V phantom power, phase and 75Hz hi pass filter, plus overload LED. Balanced line output will drive long lines without signal deterioration.

FOCUS EQ **$ 1,249 U.S.***

New Green Range Mic Preamp plus balanced line input and high impedance instrument input, followed by enhanced four band parametric EQ with hi and lo pass filters. Output fader; balanced line output.

VOICEBOX **$ 1,349 U.S.***

New Green Range Mic Pre followed by compressor, de-esser, 3-band EQ. Downward Expander. Balanced line output. Output fader. The ultimate input stage for vocals: recording, live & post production voiceovers.

* suggested retail price

Focusrite
GREEN RANGE

Affordable Excellence through Revolutionary Engineering.

Made in the United Kingdom by: Focusrite Audio Engineering Ltd. 2 Bourne End Business Centre, Bourne End,
Bucks. SL8 5AS England. Tel +44 (0)1628 819456 Fax: +44 (0)1628 819443 **e-mail:** sales@focusrite.com
USA: **Group One Ltd.** 201 Wilshire Blvd. #A18 Santa Monica CA 90401 Tel (West): 310 656 2521 (East): 516 249 1399

CIRCLE 28 ON FREE INFO CARD

GATES GRATES

I cannot properly express to you the wracking revulsion I experienced at the sight of your offensive composite photo of Bill Gates with the Beatles. To allude that Mr. Bill has had any worthwhile contribution to anything creative or artistic is so outlandish that I was temporarily frozen in a seizure of disbelief. His crippling stranglehold on operating systems with imbecilic products like MS-DOS, Windows, and now, behold, a Mac-like Windows 95 (a decade after his media machine ruthlessly slammed the Macintosh OS), have retarded the progress of personal computing by many years, indeed. The man-boy is motivated to foist his geometric vision of computing down and up every available public orifice. Why can't he take his ball and jacks, go home, and philanthropize with his 40 pieces of silver?

And you people! Don't get me started! It's one thing to inform your readership of new tools, but to even think of that photo? Holy Cow.

Tim Erskine
Salt Lake City, UT

MORE ON MIKING

Re: Microphile on RCA BK-5A (August '95) and Swedien mic techniques article (March '96).

I enjoyed this review and the closeup of the mic. Yes, it was a crooner's mic. You may recall that Perry Como used it on his TV show from the Ziegfield Theater in New York City. It hung from a boom and was frequently in the picture while he sat on a stool. He and his technical director, Chester Rackey, preferred it for the warm sound plus feedback reduction.

Note from my Chapter 6 in the *Handbook of Audio Engineering*, McGraw-Hill, 1988, that the Olson patent refers to acoustical networks that make it more directional than a cardioid or hypercardioid, hence it was called "uniaxial." Its response is 8 dB down at 90 degrees and a null at 180 degrees. The frequency response is smoother than the 77-DX in the presence region, and extends flat past 15,000 Hz, whereas the 77 response is falling.

The blast filter plus the accessory windscreen favored its use by TV 10 in Philadelphia for a live western shot in their back lot many years ago. The original lab models by Olson and Preston were used by President Eisenhower and were on display in the Smithsonian prior to the recent remodeling of the History Museum.

They are being rediscovered in the quest for warmer sound these days, and I have been receiving calls about it lately from Ron Streicher, who is experimenting with it in his recordings.

I also enjoyed the recent article by Bruce Swedien that reveals his secret recording methods. Much of it is just good engineering, but the basic pickup method with coincident omnis leaves me baffled. I happened to be taping my church choir one Sunday and listening to the audio via headphones or speakers in our audio room. The mic was an AKG C-422 stereo mic at 10 feet overhead and in front of the choir with capsules at a 90-degree angle. As it was not an important tape, I varied the patterns from omni through cardioid to bidirectional. At the omni setting, it sounded like a mono recording. Stereo was best at bidirectional, which makes sense as this is a Blumlein array. Cardioids need a 120-degree angle, so the stereo was more compressed towards mono.

Is Bruce making mono recordings, or are his capsules much farther apart than the C-422's, which would improve the stereo effect?

Jon Sank
Cross Country Consultants
Haddonfield, NJ

[Good question. Unfortunately, when we asked Mr. Swedien to respond, we found that he was out of the country and would not be able to answer until our press deadline had passed. Look for his comments in next issue's letter page. —Ed.]

WHO'S A DOPE

I was recently reading the April '96 issue of *EQ* and enjoyed it until I got to the "Marathon Man" article. You see, my band is also called The Dopes. *We have trademarked the name. It is ours.* We are an unsigned band from NYC where we have built a great reputation for ourselves. Aside from the fact that we have successfully stopped Viacom Networks, Inc. from producing a pilot show called *The Dopes*, we are also featured in the Rock 'n' Roll Hall of Fame museum. There is a mannequin of our lead singer, Trick-Fall, displayed in the section called "All the Young Dudes." The (real) Dopes display is alongside Iggy Pop, David Bowie, L7, and Psychotica.

We have also released an independent 13-song CD, *Dawn of the Dopes*. It was recorded by Kramer in 1994 and we have distributed over 2500 copies. We are now going back into the studio to record a new four-song EP of our recent work and are planning an east coast tour.

We wish the *other* band well, but would very much appreciate it if they would stop using the name we have worked very hard at securing. It would also help both sets of fans who might otherwise see the wrong band by mistake.

If you would like more information or a copy of the CD, don't hesitate to call 212-225-4985 or 212-757-9890.

Terence Enright
Manager
The Dopes

UP IN SMOKE

Re: Erick Blaze's "Just Say No" letter in *EQ* April '96.

I couldn't agree more. Every time I see a music video where the singer and/or guitarist has a cigarette so "coolly" dangling from his lips I get the urge to slap someone.

That one image is going to push X amount of kids over the edge. And it's a long way down.

Let Keith Richards and the like wheeze their way into oblivion. Don't let them take anymore people with them.

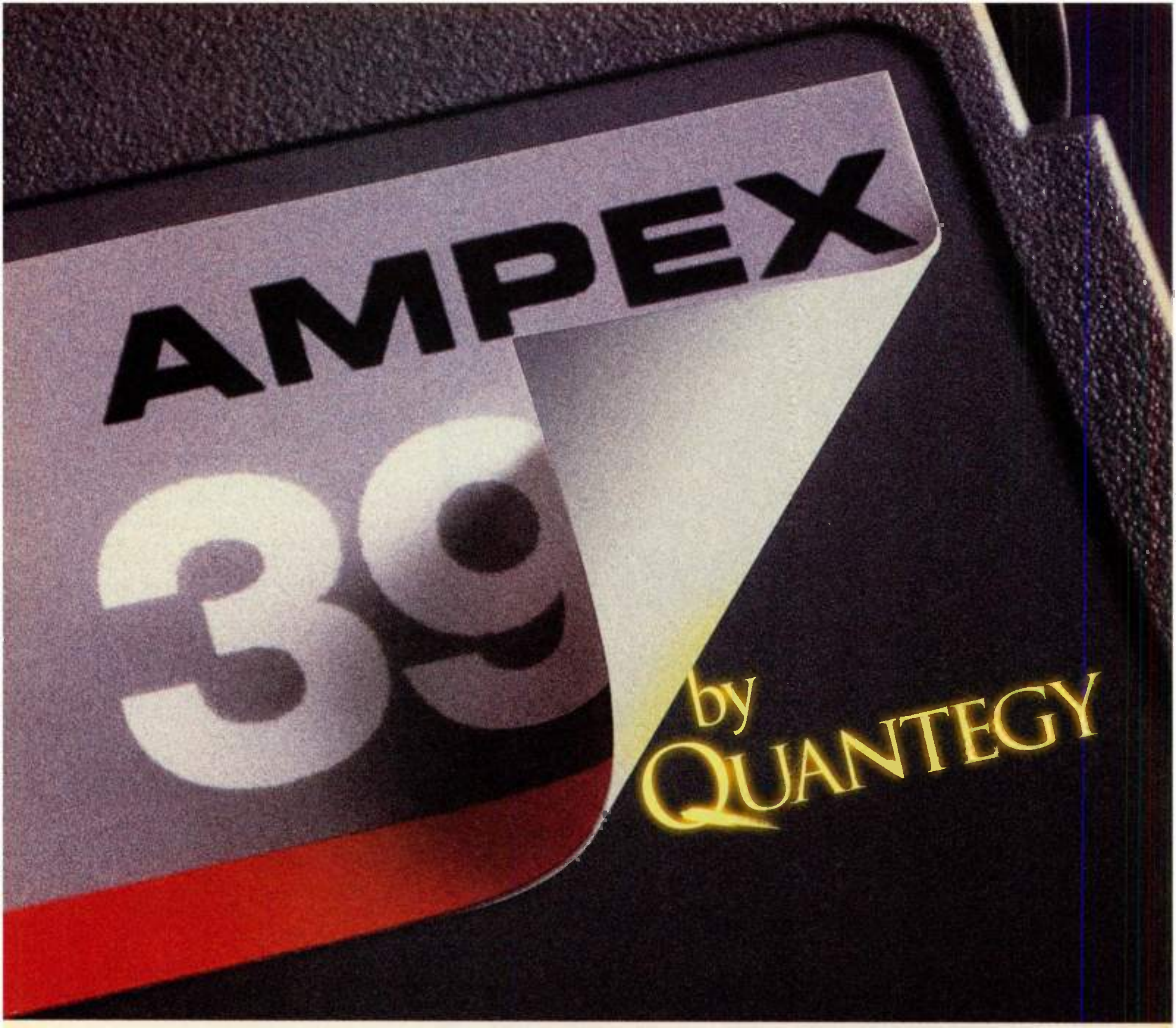
Drew Arnott
Burnaby B.C., Canada

MR. FIX-IT

I want to express my thanks for the maintenance articles by Eddie Ciletti. They are extremely useful and possibly the only detour from the poor house. Let me explain.

It used to be that the technology was in the U.S. If the Ampex, Crown, or Scully tape deck broke down, you could figure it out. You might have to buy a bearing or tape head. It didn't take a PhD to figure out how to put it on or how to align it. With DAT machines, etc., you are almost a victim. For instance, my Sony PCM-2300 was only a little out of warranty. When ejecting a DAT, it happened to pull a little loop out of the shell. The jinglish service manual was too confusing, so I took it directly to

WRH



INTRODUCING QUANTEGY.
THE NEW COMPANY THAT'S BEEN MAKING AMPEX TAPE FOR OVER 35 YEARS.

Nothing's changed, really.

You still get the audio mastering tapes that go gold more than all other brands combined.

The same top quality video tapes used by broadcast and creative professionals around the world.

The same market-leading instrumentation tapes used by aerospace and government.

And the same manufacturing, technical support and sales people.

You even get the same Ampex™ brand name.

The difference is that we're now the *only* media company dedicated exclusively to you, the recording professional.

So call us today and we'll tell you more about Quantegy.™

After 35 years, we're just getting started.

QUANTEGY™

Quantegy Worldwide Sales Offices

Northeast (New York)	(201) 472-4100	South Central (Dallas)	(214) 620-9033	UK & Ireland (London)	44-1-734-302240	Middle East/Africa (London)	44-1-734-302208 ext. 213
Mid-Atlantic (Washington, D.C.)	(301) 530-8800	Northwest (San Francisco)	(510) 881-7341	Italy & Iberia (Rome)	39-6-529-3310	Benelux (Nijmegen)	31-24-3730484
Southeast (Atlanta)	(770) 491-7112	Southwest (Los Angeles)	(818) 566-1089	Germany & Austria	49-69-8007540	Scandinavia (Stockholm)	46-8-590-75100
Midwest (Chicago)	(708) 590-5100	France & North Africa (Paris)	33-1-4731-7171	Central Europe (London)	44-1-734-302208 ext. 209	Canada (Toronto)	(905) 821-8840

Latin America & Caribbean (San Francisco)	(415) 903-1132
Asia (Hong Kong)	852-2736-1866
Australia & New Zealand	61-2-869-0600

All trademarks are the property of their respective owners. Quantegy Inc. 1025-A Terra Bella Avenue, Mountain View, CA 94043 (415) 903-1100

1/96

CIRCLE 06 ON FREE INFO CARD

HOLDS UP
ON THE ROAD
TYPE 85 FET DIRECT BOX
AMP.
INST.
PICKUP
INPUT
SPEAKER

COUNTRYMAN ASSOCIATES, INC.
417 Stanford Ave. Redwood City, CA 94063
Phone: 1-(800)-669-1422 Fax: (415)-364-2794 Email: sales@countryman.com

CIRCLE 80 ON FREE INFO CARD

MUSICIAN'S Friend
BUILD A CITY OF STUDIO GEAR...
1.800.776.5173
2 DAY EXPRESS DELIVERY
CALL 1-800 776-5173
AND GET THE BEST MUSIC EQUIPMENT CATALOG IN THE BUSINESS.
FREE!
2 DAY EXPRESS DELIVERY NO EXTRA CHARGE

VALUE, SERVICE & SELECTION

- Fast 2-DAY DELIVERY at no extra charge
- 45-day money-back satisfaction guarantee
- Toll-free ordering 7 DAYS A WEEK
- Full technical support & customer service
- Up-to-the-minute inventory and price info.
- Major credit cards

BIG FULL-COLOR CATALOG

- Detailed product descriptions
- Informative product articles
- A HUGE SELECTION of **quality brand name music equipment** including the very best in the business!

☐ **YES!** Rush me the next 3 editions of MUSICIAN'S FRIEND **FREE!**

Join hundreds of thousands of satisfied musicians in receiving the #1 music catalog, absolutely free! CALL 1-800-776-5173, or mail this coupon to Musician's Friend, P.O. Box 4520 • Dept. 114 • Medford, OR 97501

NAME ____________________

ADDRESS ____________________

CITY ____________________

ZIP ________ STATE ________

MAIN INSTRUMENT PLAYED ____________________

CIRCLE 46 ON FREE INFO CARD

Sony. They told me that adjustment was not supposed to be done; that Sony said there was a new mechanism update that I had to buy. That cost me $500. They even added on a $95 cost for rebuilding the old one! That I took issue with and promptly got a refund.

This, however, points out the extreme cost difference in the cost of operating a small recording business. On an open-reel machine, a screwdriver would have fixed it. With the new machines, you scrap everything and start over again.

Another interesting thing to investigate might be servicing CD-R machines. When my Marantz recorded a dud disc, the disc supplier and Marantz pointed at each other. Believe it or not, they don't really have a way of checking the laser output of these things, nor the error rate. They stick in a disc and try recording. If it has an obvious problem, they "fix" it. If the problem is subtle, you gamble at "fixing" it. "Fixing" it consists of replacing the entire CD mechanism for $500. If you try to buy the part yourself, the cost is $1500!

Mike Stosich
Esoteric Sound
Downers Grove, IL

FRANK TALK

Re: Correction to Francis Buckley's story about our 20/20 bas monitors in the "Up Close and Personal" article in the June '96 issue.

While I enjoyed many engineering projects during my 17 wonderful years with UREI, credit for the legendary UREI 1176 limiter design must go to Bill Putnam, the company's founder and visionary leader. Later, in the early '70s, Brad Plunkett improved the noise by 6 dB and the "LN" version (for low noise) was produced. UREI was a wonderful place to be those days, and I owe so much to Bill and Brad for their understanding of the art, science, and business we all continue to enjoy today.

Frank Kelly
Event Electronics

WRITE TO US

Send your letters to:
EQ Magazine • Editorial Offices
939 Port Washington Blvd.
Port Washington, NY 11050
Fax: 516-767-1745
E-mail: EQMagazine@aol.com

WRH

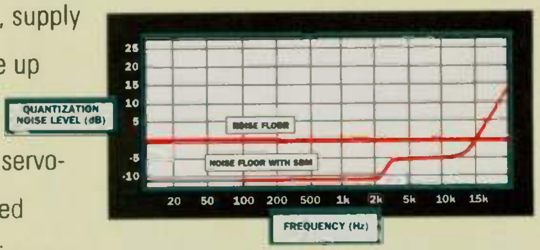
BUILT LIKE A BATTLESHIP.

SONY
POWER
PCM-2800

WITH A SOUND THAT WILL BLOW YOU AWAY.

The Sony PCM-2600 and PCM-2800 DAT recorders are durable enough for the daily battles of the audio professional, sophisticated enough to provide day in and day out great sound.

Four direct-drive motors (on the head drum, capstan, supply and take up reels) and our servo-controlled mechanism mean better tracking, lower error rate, longer motor and tape life, and faster, smoother high speed cueing and shuttling.



SBM is a sophisticated noise shaping technique that significantly reduces audible noise by shifting it to a higher, less audible frequency range, maintaining near 20-bit performance.

And only Sony offers Super Bit Mapping® (SBM), a patented technology used in major mastering facilities and now available on our pro DAT recorders for improved sonic performance.

SBM maintains much of the sonic quality of the 20-bit signal created in the recorder's advanced A/D converter and stores the data in the 16-bit DAT format. The result is superior sound resolution with added clarity and greater imaging.

And the PCM-2800 adds Read-After-Write (RAW) confidence monitoring for those critical recording situations.

But don't just take our word for it all. Call 1-800-635-SONY, ext. SBM for more information. And prepare to be blown away.

SONY

©1996 Sony Electronics Inc. All rights reserved. Reproduction in whole or in part without written permission is prohibited. Sony and Super Bit Mapping are trademarks of Sony.

WRH

EQ&A

MANUAL LABOR

Q *I was wondering if you could tell me where I might be able to find a master service manual for a 1973 Marshall Superlead 100W, Model 1959. The customer service rep at Korg said that information was only available for the reissue model.*

Jon Olstadt
via the Internet

A The schematic for that model can be found in the Groove Tube amplifier books by R. Aspen Pittman [Groove Tubes, Tel: 818-361-4500]. Three 1970 versions appear in *THE TUBE AMP BOOK II* on pages 335, 336, and 337 or, in the 4th edition, on pages 590, 591, and 592.

Eddie Ciletti
Contributing Editor
EQ Magazine

THAT SYNCING FEELING

Q *I have a TASCAM TSR-8 that syncs up to [Opcode System's] Studio Vision Pro using SMPTE and MMC. I am going to buy a couple of ADATs or DA-88's this summer and I want to know how to sync up the TSR-8 and the digital 8-tracks and use Studio Vision Pro as the master. I've heard it can be done, but I have no idea what equipment I would need. Is there such a product from TASCAM or JLCooper?*

Chris Walcott
Shockwave for
Director Development

A When synching a TSR-8 and DA-88's together, we recommend slaving the DA-88's (by means of the TASCAM SY-88 sync card installed in the master DA-88 unit) to the TSR-8.

While you would generally expect to slave the analog open-reel to the digital machine, the reality of the situation is that the TSR-8 is unable to keep up with the rapid response transport of the DA-88, and hence, spends way too much time chasing. Also, if you were to slave the TSR-8 by means of the ATS-500 synchronizer, you would then be unable to control the unit via MMC [MIDI Machine Control].

TASCAM recommends, therefore, that you use the TSR-8 as the master of your system. By employing an MMC-100 MMC interface with the TSR-8, you'll be able to generate timecode, record it to an open track, and then feed that timecode back either as SMPTE or MTC. In this scenario, however, we'll use the DA-88's SY-88 sync card for timecode generation, using the MMC-100 strictly for playing back timecode and MMC functions, so read on.

By working in this manner, you can control the transport and track arm/disarm functions of the TSR-8 right from your Mac once you establish bidirection MIDI communication between the Mac and MMC-100/TSR-8. The timecode on the TSR-8 will be fed via the MMC-100 to the SY-88/DA-88's while it also feeds MTC to the Mac.

The situation with the DA-88's is slightly more involved. We recommend using the SY-88 sync card to slave the DA-88's to incoming timecode while using the MMC-88 (attached to the master machine's Sync In port) for MMC functions — assuming you will be using more than one DA-88. While the SY-88 supports MMC, its does so on a one-machine-only basis. Hence, there would be no response if you attempted to arm tracks on the second DA-88. As the MMC-88 passes MIDI messages via the DA-88's sync ports, this limitation is averted.

With the above situation in mind, begin by using the SY-88 to simultaneously generate timecode to both the subcode area of the master DA-88 as well as an open track on the TSR-8 (even though the MMC-100 is capable of this task). The DA-88's would slave to the TSR-8's incoming timecode via the SY-88 in the master unit, while the Mac/Opcode system would feed MMC messages directly to the MMC-88's MIDI IN port for track arm/disarm functions. Now for the final consideration.

Because you are dealing with two different types of recorders from two different generations, you will also need to be cognizant of Machine ID numbers for the purpose of arming and disarming the tape tracks. Without defining Machine ID for the recorders, each time you arm track 5, for example, you will arm that track on both the TSR-8 and the first DA-88. By leaving the MMC-100/TSR-8 alone, and defining

PATCH BAYS • MIXERS • AMPLIFIERS • ADAPTORS • CONNECTORS • 800-733-9473 • WHIRLWIND • 99 LING RD • ROCHESTER • NY • 14612 • CABLES • TUBES

Whirlwind's new PM™ Tubes set a higher standard for performance, matching, and reliability.

whirlwind

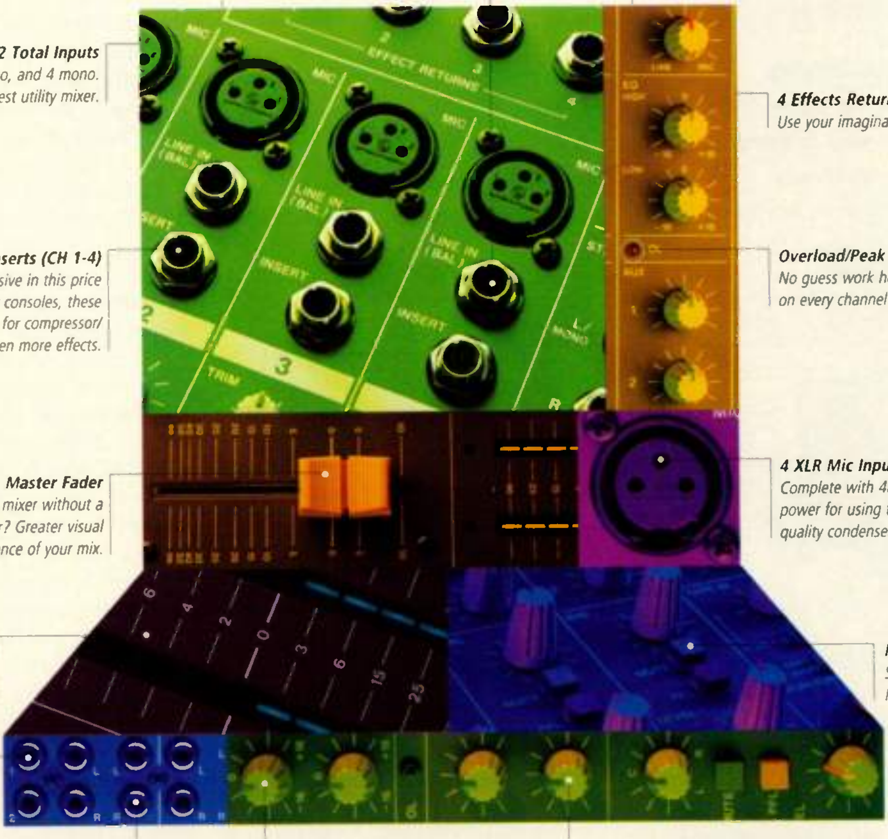
All PM power tubes ship computer matched in pairs and quads at no extra charge, and are at dealers now!

CIRCLE 71 ON FREE INFO CARD

Rack Mountable and Rugged
Use it in the studio, in the field or in your rack.

Balanced Inputs and Outputs
Running lots of cable? Using pro equipment? You'll need these. (Unbalanced, too!)

Double Reinforced Ground
Part of TASCAM's low noise circuitry that promises transparency and hum free operation.



12 Total Inputs
4 stereo, and 4 mono. The world's best utility mixer.

4 Effects Returns
Use your imagination.

Channel Inserts (CH 1-4)
A TASCAM exclusive in this price range. Just like larger consoles, these handy inputs are great for compressor/limiters or using even more effects.

Overload/Peak Indicators
No guess work here. You get them on every channel and for PFL.

60mm Master Fader
What's a mixer without a master fader? Greater visual reference of your mix.

4 XLR Mic Inputs
Complete with 48V phantom power for using the highest quality condenser microphones.

Precision 12-Segment Display
Bright LEDs so you know what's going on.

Mute & PFL
Switches on every channel. PFL overload indicator too!

Stereo Buss/AUX SUB Inputs
Signal routing designed for flexibility and expansion.

Dedicated Stereo Tape Input
No need to waste a precious stereo channel for your master recorder. Assignable to L/R buss or monitor

EQ on Every Input
Hi (12kHz) and Low (60Hz) ±16dB on each.

2 AUX Sends
Take your signals Pre or Post

THE LAPTOP YOU CAN GET FOR UNDER $350*

No more excuses for not having a compact, full-featured utility mixer. A mixer you can plug in anywhere. Need more inputs? How about a submixer? What about audio for video or multimedia? Get a TASCAM M08. It's the perfect mixer for these applications and more. Part of the new breed of next-generation mixers from the leader in recording, TASCAM's new M08 will surprise you. You'll scratch your head trying to figure out how we can give you so much mixer for so little cash. No tricks. Just value.

Look at all those features! It's the mixer that goes anywhere to do almost anything. Use it every day — or when you're in a crunch. So whatever you do, don't scramble for more inputs, or schlep that big mixer, pull out your M08 instead. It's the world's best and hardest working compact utility mixer. And it comes with TASCAM quality and durability at no extra cost. Everybody needs one. Best part is, at $349 anyone can have one. They're at your dealer. Get yours today.

TASCAM
Take advantage of our experience.

CIRCLE 77 ON FREE INFO CARD

©1996 TEAC America, Inc. 7733 Telegraph Road, Montebello, CA 90640 (213) 726-0303
TEAC Canada LTD., 340 Brunel Road, Mississauga, Ontario L4Z 2C2 Canada (905) 890-8008
*Actual MSRP is $349.00. Actual prices may vary by dealer.

TASCAM FAXBACK 1-800-827-2268
INFORMATION+SPECS VIA FAX
800 • 827 • 2268
DOCUMENT #6280

UTILITY
M08
MIXER

IMPROVE AUDIO/VIDEO QUALITY

DeoxIT™

- Improves Conductivity
- Reduces Noise & Distortion
- Deoxidizes, Cleans & Protects
- Reduces Intermittents
- Reduces RFI, Wear & Abrasion

Even the finest equipment cannot guarantee noise-free operation. One "dirty" connection anywhere in the signal path can cause unwanted noise, distortion and signal loss. Considering the hundreds (if not thousands) of connections in electronic equipment today, it's only a matter of time before they begin to fail.

Fax/mail this Ad for FREE SAMPLE

Use what the Manufacturers Use!

NEW Mini-Spray

Available In Environmentally-Safe Spray, Wipes, Pen, Precision Dispensers & Bulk Containers

Some film deposits are effectively removed with "wash-type" cleaners such as contact/tuner cleaners, degreasers, alcohols and other solvents. Oxides and sulfides, however, become an integral part of the contact surface and cannot be removed by ordinary contact cleaners.

DeoxIT dissolves oxides and sulfides that form on metal surfaces, removing these sources of resistance. This restores the contact's integrity and leaves a thin (organic) layer that coats and protects the metal.

DeoxIT's advanced formula contains deoxidizers, preservatives, conductivity enhancers, arcing and RFI inhibitors and anti-tarnishing compounds that significantly increase the performance and reliability of electrical components and equipment.

DeoxIT provides long-lasting protection, reducing the expense of repeated cleaning with expensive and aggressive ozone-depleting solvents.

DeoxIT outperforms & outlasts all other contact cleaners.

Non-flammable, Safe on Plastics & Environmentally-safe.

CAIG PRODUCTS . . . USED BY THOSE WHO DEMAND THE BEST!

Ampex
Boeing
Diebold Inc
Dolby Lab.
Federal Express
Fluke Mfg. Co.
General Electric
Hewlett Packard
Honeywell
McIntosh Labs
Motorola
Rane
Switchcraft
Tektronix
Texas Inst
Xerox Corp

CAIG LABORATORIES, INC.

1-800-CAIG-123

16744 West Bernardo Drive
San Diego, CA 92127-1904
TEL: 619 / 451-1799
FAX: 619 / 451-2799
E-Mail: caig123@aol.com
URL: http://www.caig.com

CIRCLE 81 ON FREE INFO CARD

Machine ID for the DA-88's via the dip switches on the front panel of the MMC-88, you will be able to treat these recorders as separate systems.

Roger Maycock
Marketing Support Representative
TASCAM

BEING PC

Q I am interested in trekking into the PC audio editing field. The PC I am using is a 100 MHz Pentium with 8 MB of RAM and a 1.2 GB hard drive, running under Windows 95.

I assume the first issue I need to address is a sound card appropriate for importing digital audio from the AES/EBU port on my DAT. I also realize that an upgrade of at least 8 more MB of RAM will be helpful. This is where I start to get lost. Most of the software packages I see include some sort of MIDI capabilities, which I will have little use for. I have also seen recommendations for a separate "A/V" hard drive.

The editing capabilities I am looking for are level setting, EQ, crossfades, and possibly spot compression. For output, I will need to get back to my DAT and, in the future, to a CD-R.

My questions are:

1. Are there software programs out there that will be useful to me without wasting space on MIDI applications?

2. What's the deal concerning "A/V" drives?

3. Should I not waste my time and just purchase a dedicated Pro Tools-type system instead?

Russ Diamond
Raintree
Lebanon, PA

A First, yes, there are quite a few programs out there, but your first consideration is your sound card. If you're talking about transferring between your PC and your DAT, probably the highest quality approach would be a card that transfers sound via the S/PDIF digital audio protocol (you said that you'd like to use the AES/EBU ports, but the consumer S/PDIFs are as good, and in that they transfer index markers, are often better). My suggestion would be to get Digital Audio Labs (D.A.L.) Digital Only Card or check out Digidesign's new AudioMedia III card.

Now back to your software question. D.A.L.'s Fast Eddie or Steinberg's WaveLab stereo editors are fast and get the job done. Multitrack programs for the PC, such as Samplitude or SAW Plus, will fill the bill if multiple tracks are your pleasure. For out-'n'-out signal processing, I'd recommend Sonic Foundry's Sound Forge.

Next, the term A/V drive is just a trade name for drives that generally conform to the ATA-2 standard. They have the advantage of not being constrained by the 528 MB limitation that was imposed by older computers and are able to transfer data at much higher speeds. Remember, when it comes to digital audio and video, speed's the name of the game!

Finally, I don't know, should you not waste your time? Seriously, it's your decision. There are a small number of dedicated systems out there, most of which are designed for the Mac. (Creamware's tripleDAT for the PC will be reviewed in an upcoming issue.) The best approach with any of this gear is to go to your nearest music or pro-audio dealer and test drive the options for yourself. Hang in there!

David Miles Huber
Contributing Editor
EQ Magazine

CARD CARRIER

Q A (Digidesign) TDM system has lots of cards. How do I know which goes where?

Mike Foster
Yorba Linda, CA

A Always observe the correct card order when installing expanded Pro Tools and Pro Tools III systems. Use the Expansion View program to verify the slot order for your Mac. Disk I/O or SysAxe should be in the lowest alpha numeric slot, then any Bridge I/Os, any Farms, any SCII/TDM, followed by any non-TDM cards. This is especially important in Pro Tools III systems, since the I/O card in the lowest slot is the clock master, and Bridge I/Os installed higher than Farms will not work properly.

Tom Cockrell
Technical Support Manager
Digidesign

Send your queries to:
EQ Editorial Offices,
939 Port Washington Blvd.,
Port Washington, NY 11050
Fax: 516-767-1745
E-mail: EQMagazine@AOL.COM

EVENT
20/20
BIAMPLIFIED SYSTEM

Get 20/20 Vision.

Visualize this . . .

A monitoring system so good that it's easy to recognize the perfect detail of each sound.

Introducing the 20/20 *bas* system from **Event Electronics.**

20/20 *bas*

BIAMPLIFIED MONITOR SYSTEM

- Internally BiAmplified; **200W Total Power**
- **An Active Asymmetrical Fourth Order Crossover** that separates the line level frequencies prior to amplification
- **A 130 Watt Amp** that receives only the low frequencies and is designed to perfectly match the **8" Mineral Filled Polypropylene Low Frequency Driver**
- **A 70 Watt Amp** that receives only the high frequencies, designed to perfectly match the **1" Natural Silk Dome Tweeter**
- **A Large Diameter Low Air Restriction Front Mounted Bass Port** for full, accurate bass response
- An intelligent combination **XLR or ¼" Input Connector**
- Continuously **Variable Precision Low and High Frequency Trim Controls**
- **Input Sensitivity Control** and **Clip LED Indicator**
- **Circuit Breaker** (no looking for fuses in the middle of the night)

It's easy to put the puzzle together when you can clearly see each piece. Seek out your nearest **Event Electronics** dealer and start your next mix with perfect sonic vision.

$1000 per pair*

*Unpowered 20/20's available for under $400 per pair.

EVENT
ELECTRONICS INC

P.O. Box 4189
Santa Barbara CA 93140-4189
voice 805-962-6926
fax 805-962-3830

CIRCLE 35 ON FREE INFO CARD

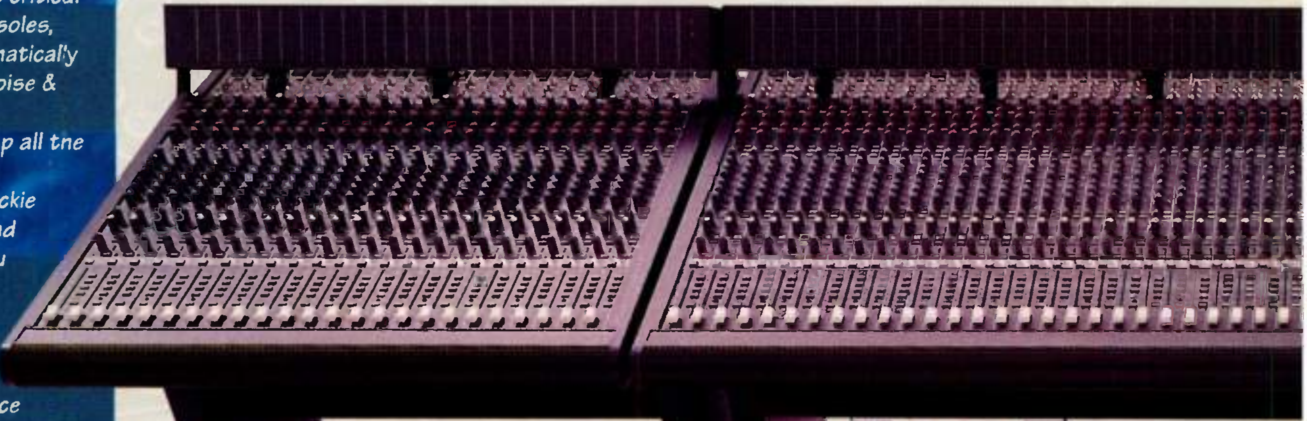
THIS AD CONTAINS 8 REA
YOUR FREE 1-HR. MACKIE

1 VLZ CIRCUITRY FOR ULTRA-LOW NOISE AND CROSSTALK. *Did we just make up a fancy name for the same old circuitry? Nope. VLZ (Very Low Impedance) is a Mackie innovation based on solid scientific principles. Through the careful deployment of high operating current and low resistor values at critical points in our consoles, we're able to dramatically reduce thermal noise & adjacent-channel crosstalk. Open up all the channels, subs & masters on a Mackie 8•Bus console and compare what you hear (or rather don't hear) with any Brand X console. Because Very Low Impedance circuitry needs loads of high current, we ship a humongous, 220-Watt Triple-Regulated power supply with every 8•Bus*

2 IT EXPANDS ALONG WITH YOUR NEEDS AND BUDGET. *You'd be surprised just how many 8•Bus console setups like the one below are currently in use. But you don't have to start out this way. Start out with a 24•8 or 32•8 and then grow your 8•Bus console 24 channels at a time with our 24•E add-on modules. 1, 2 or even 3 of 'em connect in minutes. They come with their own 220-watt power supply; optional meter bridges are available.*

3 IMPECCABLE MIC PREAMPS. *A console can have motorized dooflammers and an optional MIDI espresso attachment, but if the mic preamps aren't good, you don't have a fully-useful production board. Our discrete preamps with large-emitter-geometry transistors have won a critical acclaim for their exceptional headroom, low noise (–129.5dBm E.I.N.) & freedom from coloration. VLZ circuitry in the preamp section also reduces crosstalk.*

4 THIS CONSOLE JUST PLAIN SOUNDS GOOD. *Sure, you may be able to buy a Brand X console for less. But you end up with a console that sounds like…well…a Brand X console. Granted, we're getting into a pretty subjective area here…but we have tall mounds of 8•Bus warranty cards that rave about our consoles' "clarity," "sonic purity," "sweet sound," "transparency," "lack of coloration" and a lot of other superlatives we wish we'd thought of first.*



Above: 24•E 24-ch. expander with optional MB•E meter bridge and stand.

6 MAC® & WINDOWS® 95-BASED AUTOMATION THAT'S RELIABLE, PROVEN AND AFFORDABLE.

Along with affordable digital multitrack recorders, the Mackie 8•Bus has made it possible to do world-class productions on a modest budget. But until now, Big Studios have still had one remaining and unattainable creative "secret weapon"… computerized level automation. That's why we developed the UltraMix™ Universal Automation System. It gives you fully editable and recallable control of input, channel and master levels — plus features not found on even the most expensive proprietary Mega-Console automation systems. Equally important, it doesn't degrade sound quality, introduce zipper noise or cause audible "stepping." UltraMix is currently being used to mix network television music themes and on several major album projects – by seasoned engineers who grew up on Big Automation Systems. Their verdict is that UltraMix is a serious automation solution – stable, reliable and frankly easier to use than more expensive systems. The basic system controls 34 channels and can be expanded to as many as 128 channels. UltraMix Pro™ software, for 030/040 & Power PC Macintoshes and PCs (Windows® 95 required), includes a wealth of features like editable fader curves, built-in level display, unlimited subgroups, SMPTE time code display, event editor with pop-up faders, optional control of outboard effects devices and the ability to play Standard MIDI files from within the program.

Master Section

UltraMix™ includes the Ultra-34 Interface, UltraPilot Controller and software for $2797 suggested U.S.. retail. Macintosh® or Windows® 95-compatible PC not included.

---

[1] Mention in this ad denotes usage only, as reported to Mackie Designs, and is in no way intended to constitute official endorsement by the artists or groups listed.

* As compiled by a leading Independent Console Video Factoid Evaluation Laboratory. Your count of superior Mackie 8•Bus console features may vary.

SONS TO BUY OUR 8•BUS CONSOLE.
VIDEO CONTAINS AT LEAST 71.5* MORE.

5 PROFESSIONALS REALLY USE THEM. *The members of Boyz II Men could have afforded any console they wanted for their studio's second room. They chose an 80-input 8•Bus with 102 channels of UltraMix™ automation. In the studios of artists as diverse as k.d. lang, Yes, Queensryche, Lee Roy Parnell, Aerosmith, Bryan Adams, Carlos Santana, Whitney Houston, Eric Clapton & U2, our consoles really are used to make great music.*

WHY YOU SHOULD BUY AN 8•BUS

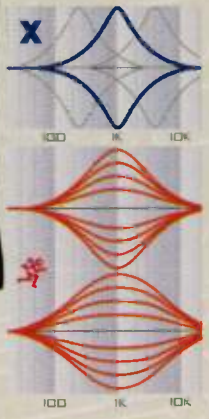
FREE VIDEO! *Choosing the right 8-bus console can be pretty confusing these days. That's why we've whomped up a free video that gives you some solid reasons to buy a Mackie 8•Bus. This eclectic compilation contains excerpts from our epic 8•Bus Video Owner's Manual, an introduction to UltraMix™ Automation System and an award-winning short subject, The 2nd Mackie Home Video. Watch all three parts before you part with bucks for any 8-bus console.*

FREE VIDEO FINE PRINT. *Visit your local Authorized Mackie Dealer for a real live 8•Bus demo, and then snag your free video. This handsome offer is good while supplies last, or until August 31, 1996, whichever occurs first. So, you snooze, you looze. Limit: one per customer. If you just can't seem to make it to a dealer, it's available from Mackie by phone or fax request – no reader response cards. Allow six weeks for delivery. You will also receive our 48-page 8•Bus and UltraMix™ Universal Automation System color tabloid. This video offer is available to respondents in the U.S. only. Canadian readers, call SF Marketing at the toll-free phone number below. In other countries, please consult your local Mackie Designs Authorized Distributor.*

Above: 24•E 24-ch. expander with optional MB•E meter bridge and stand. Above left: 32•8 with optional MB•32 meter bridge and stand.

Above: The SideCar, matching 8•Bus equipment rack.

7 WIDE MID RANGE EQ. *Whether you're tracking or mixing, equalization is one of your most important creative tools. We concentrated on important things like giving you Classic English Console EQ capabilities. By that, we mean extremely-wide-bandwidth peaking equalization that can be used to achieve effects that simply aren't possible with narrower EQ. Most Brand X midrange EQs have a fixed bandwidth of about 2 octaves (blue graph above right). You can sweep it up & down the frequency spectrum, but the "sharpness" of the EQ curve is always the same.*



This kind of EQ is good for some purposes...but if you've worked with it before, you know it's too drastic and localized for gentle changes in overall tonal coloration. The 8•Bus' true parametric Hi Mid lets you spread the bandwidth out to as much as 3 octaves (red curves at left). That extra octave of "width" gives you a whole new creative palette.

8 LEGENDARY RELIABILITY. *This is one of those factors you probably don't think much about – until your console goes down at in the middle of a critical session...at 2AM on a holiday weekend. Built with pride in Woodinville, WA, USA, 8•Bus consoles have an enviable 3-year track record for enduring continuous, round-the-clock use and abuse.*

©1996 MACKIE DESIGNS INC
ALL RIGHTS RESERVED

MACKIE.™

16220 Wood-Red Road • Woodinville • WA • 98072 ☎800/898-3211 ☎206/487-4337 • e-mail sales@mackie.com
Represented in Canada by S.F. Marketing ☎800/363-8855 • Outside the USA ☎206/487-4333 ☎206/485-1152

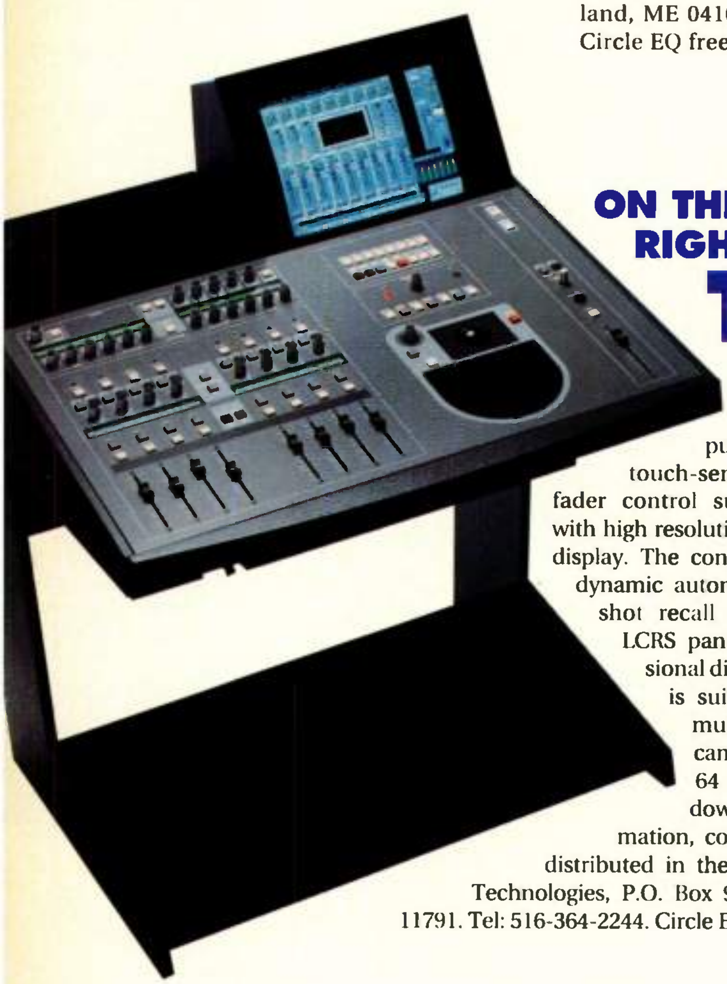
CIRCLE 53 ON FREE INFO CARD

EQ PRODUCT VIEWS

MAGNETISM

HHB has two new, rewritable magneto-optical discs that are 5.25 inches in size: the MO1.3GB and the MO2.6GB. Both meet ISO standards and contain a specially compounded polycarbonate substrate that protect them against extreme conditions in temperature and humidity. In addition, the two discs have a sputtered thin film coating on them for a higher carrier-to-noise ratio. HHB magneto-optical discs have an archival life of more than 30 years and include a hard antistatic coating to repel dust and other foreign matter. For more information, contact HHB Communications, 43 Deerfield Road, Portland, ME 04101. Tel: 207-773-2424. Circle EQ free lit. #101.

HHb
MO 2.6GB
HHb
MO 1.3GB
HHb
MO 1.3GB

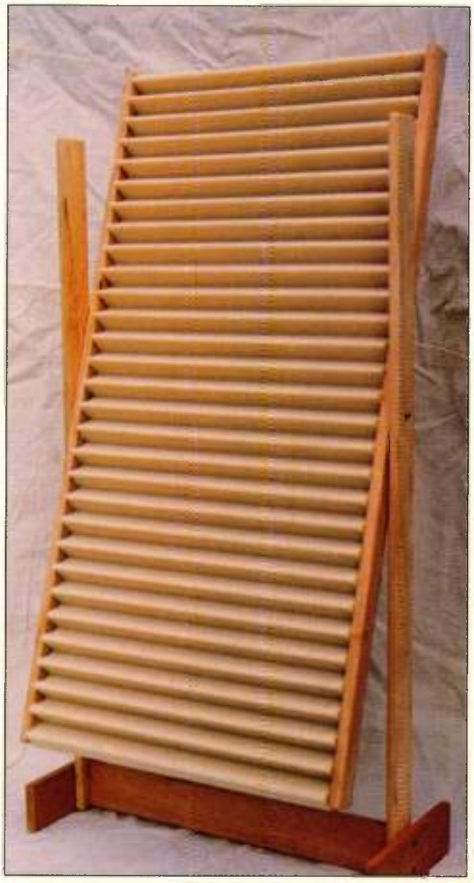


ON THE RIGHT TRAC

The new Virtua console from Soundtracs is a stand-alone unit that requires no external computer and provides a touch-sensitive motorized fader control surface combined with high resolution VDU and LCD display. The console provides full dynamic automation and snapshot recall of all functions, LCRS panning, and professional digital interfacing. It is suitable for 24 way multitracking and can provide a total of 64 inputs on mixdown. For more information, contact Soundtracs, distributed in the U.S. by Samson Technologies, P.O. Box 9031, Syosset, NY 11791. Tel: 516-364-2244. Circle EQ free lit. #102.

WALLS OF SILENCE

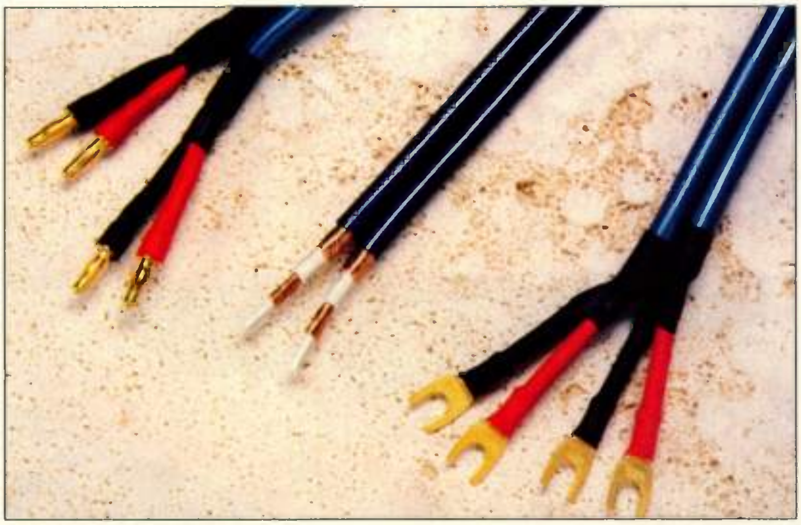
If you're interested in changing the space in your studio, check out Folded Space Technologies' Cloaking Devices. These movable walls can be stand-mounted, wall-mounted, linked in folding configurations and stacked to create neutral environments or craft sound scapes. The central building block of the Cloaking Device is the 2x4-foot panel. Each panel has an absorbent side and a reflective side and is constructed of furniture-grade woods. The absorbent side utilizes 2-inch Studiofoam by USAFoam, while the reflective side is 1/4-inch hardwood ply. For more information, contact Folded Space Technologies P.O. Box 801008, Acworth, GA 30101. Tel: 770-427-8288. Circle EQ free lit. #103.



Westlake Audio
Westlake Audio

GO WEST

Westlake Audio has introduced the Lc8.1 monitor designed for nearfield monitoring, portable use, broadcasting, and more. The Lc8.1 is hand-built using only performance-matched components and hand-wound coils. Nominal impedance is 7 ohms, sensitivity is 90.5 dB SPL, long-term power is 85 watts with short-term at 225 watts, weight is approximately 31 pounds, and the Lc8.1's frequency response is 55–18,000 Hz. For more information, contact Westlake Audio, 2696 Lavery Court, Unit 18, Newbury Park, CA 91320-1591. Tel: 805-499-3686. Circle EQ free lit. #104.

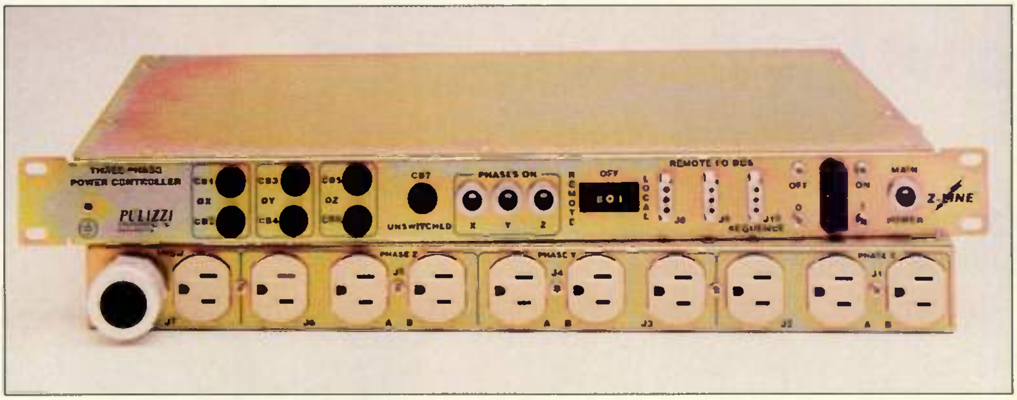


BI BI BABY

Wireworld's Discrete Biwire speaker cables utilize two symmetrical coaxial speaker cables for isolation between high- and low-range conductors. The company's newest cables, Atlantis II and Oasis II, feature two 13-gauge symmetrical coaxials bonded together in pearlescent PVC jacket. The cables in the Atlantis II utilize polymer-coated strands, while the strands in the Oasis are bare. These cables meet UL/CL3 and CSA-FT4 requirements for in-wall installation. Atlantis II speaker cables sell for $12/bulk foot, $310/2.5 M biwire pair. Oasis II speaker cables sell for $7.80/bulk foot, $225/2.5 M biwire pair. For more information, call WireWorld, 3320 Griffin Road, Fort Lauderdale, FL 33312. Tel: 954-962-2650. Circle EQ free lit. #105.

DISTRIBUTE YOUR POWER

Pulizzi Engineering's TPC 4000/MTD provides AC power distribution and Multiple Time Delay power up sequencing to all equipment connected to it in order to reduce high-inrush current and prevent momentary sags caused by power hungry motors and drives. Included is bidirectional EMI/RFI filtering and spike/surge suppression line to line, line to ground and neutral to ground. This bidirectional feature allows each duplex to be isolated from the others so that noise and spikes cannot enter. There is also remote control and emergency power off. The TPC 4000/MTD features a three-phase design (120/208 Y, 20 amp or 30-amp input) and a size of 1.75"H x 12"D. There are ten outlets on the rear panel of which there are three outlets per phase and one unswitched outlet for convenience power. List price is $915. For more information, contact Pulizzi Engineering, 3260 S. Susan Street, Santa Ana, CA 92704-6865. Tel: 714-540-4229. WWW: http:/www.pulizzi.com. Circle EQ free lit. #106.



WRH

EQ PRODUCT VIEWS

IN COMMAND

The Omnirax Commander workstation has a desk wide enough for an 88-note controller keyboard and room for a ton of gear. There are 12 rack spaces on each cabinet's sloping top front, and a four-space module in the center just behind the controller. Ten rack spaces can be found in the left cabinet's lower front, while 6 sloping spaces below a sliding computer shelf can be found in the right cabinet's lower front. The commander has a total of 60 rack spaces for all of your gear-holding needs. For more information, contact Omnirax P.O. Box 1792, Sausalito, CA 94966. Tel: 800-332-3393. Circle EQ free lit. #107.

MEET THE ELITE

Otari's Concept Elite is a new console that encompasses features found on the Otari Concept I: a digital master section, symmetrical dual input modules, snapshots, and VCA automation. The Elite adds image recall, enhanced EQ, and greater processing power. M Pan Multi-Format Panning is an option that provides panning and assignment for multichannel film formats and allows simultaneous track assignment from both module paths. Two automated joystick panners are included with this option. For more information, contact Otari Corporation, 378 Vintage Park Drive, Foster City, CA 94404. Tel: 415-341-5900. Circle EQ free lit. #108.

For Musicians

Who Bought

The Other

Digital Multitrack

SORRY!

TASCAM DA-38
WER
FORMAT/Fs
DIGITAL IN
WORD IN
FORMAT
TRK COPY
DIGITAL IN
DELAY
44.1k
48k
WORD IN
OFFSET
H
M
S
00 03 88
REW
F FWD
STOP
DTRS

LOADS OF HORNS

JBL's new Architectural Series AS 3218 is a full-range, three-way loudspeaker designed for high-power installations. The AS 3218 incorporates horn-loaded midrange technology for extended pattern control. Peak output is >130 dB SPL and there is a nominal 60-degree coverage pattern. The AS 3218 is designed for triamplified use only and is constructed in a trapezoidal enclosure for arraying purposes. Included JBL components are the 2242H 18-inch low-frequency driver, the new 2012H midrange cone driver, and a 38 mm exit large-format compression driver coupled to a JBL Optimized Aperture Bi Radial horn. For more information, contact JBL, 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-894-8850. Circle EQ free lit. #109.

KNOW THE DECODER

The Circle Surround 5.25 High-Performance Decoder is RSP's latest surround-sound product. It decodes five independent, full-bandwidth audio channels from two analog or digital delivery channels, and has 59 dB separation between the left and right stereo surround channels. This decoder adds the ability to "monoize" the stereo surround channels and to limit the bandwidth to 7 kHz via the front-panel buttons to audition the program mix on other matrix systems utilizing a mono surround. For more information, contact RSP Technologies, 2870 Technology Drive, Rochester Hills, MI 48309. Tel: 810-853-3055. Circle EQ free lit. #110.

CIRCLE SURROUND 5.2.5 DECODER
RSP Technologies

ALL INPUT
INSERT
REPEAT
MENU
SHIFT
LOC 1
MEMO 1
LOC 2
MEMO 2
PB CONDITION
RECORD
REC FUNCTION
1
2
3
4
5
6
-dB

For The Rest Of You
YOUR TIME HAS COME.

Now you can have the digital multitrack you really want. Designed specifically for musicians, the DA-38 is packed with new features and uses the same award winning Hi8 format and technology as TASCAM's highly acclaimed DA-88. The same quality, durability and dependability. And the same great sound. The DA-38 is completely compatible with the Hi8 machines used by post-production pros. Pros who can afford anything — but won't settle for less than the best. Till now, the best has had its price. But for the musician, your time is here. At $3,499* Hi8 is priced for you. So get to your dealer and buy your first DA-38. You won't be sorry!

TASCAM FAXBACK 1-800-827-2268
INFORMATION+SPECS VIA FAX
800 • 827 • 2268
DOCUMENT #8500

TASCAM.
Take advantage of our experience.

© 1996 TEAC America, Inc. 7733 Telegraph Road, Montebello, CA 90640 (213) 726-0303 TEAC Canada LTD., 340 Brunel Road, Mississauga, Ontario L4Z 2C2 Canada (905) 890-8008 *MSRP

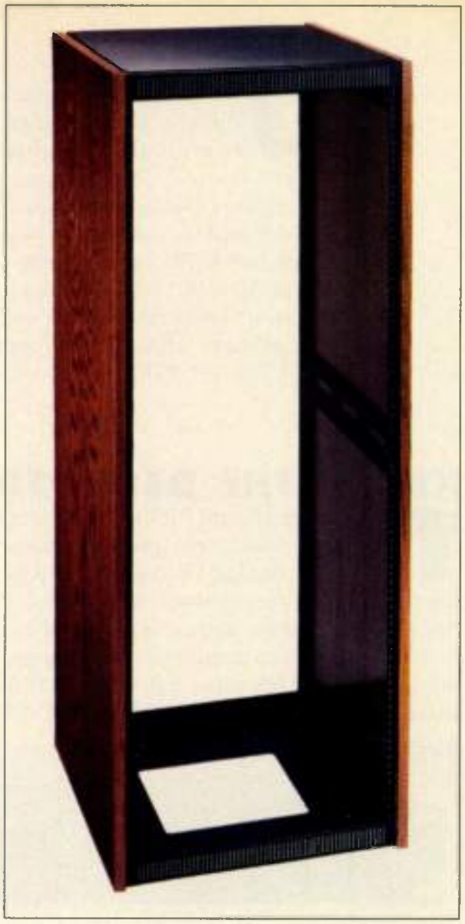
CIRCLE 63 ON FREE INFO CARD

WRH

EQ PRODUCT VIEWS

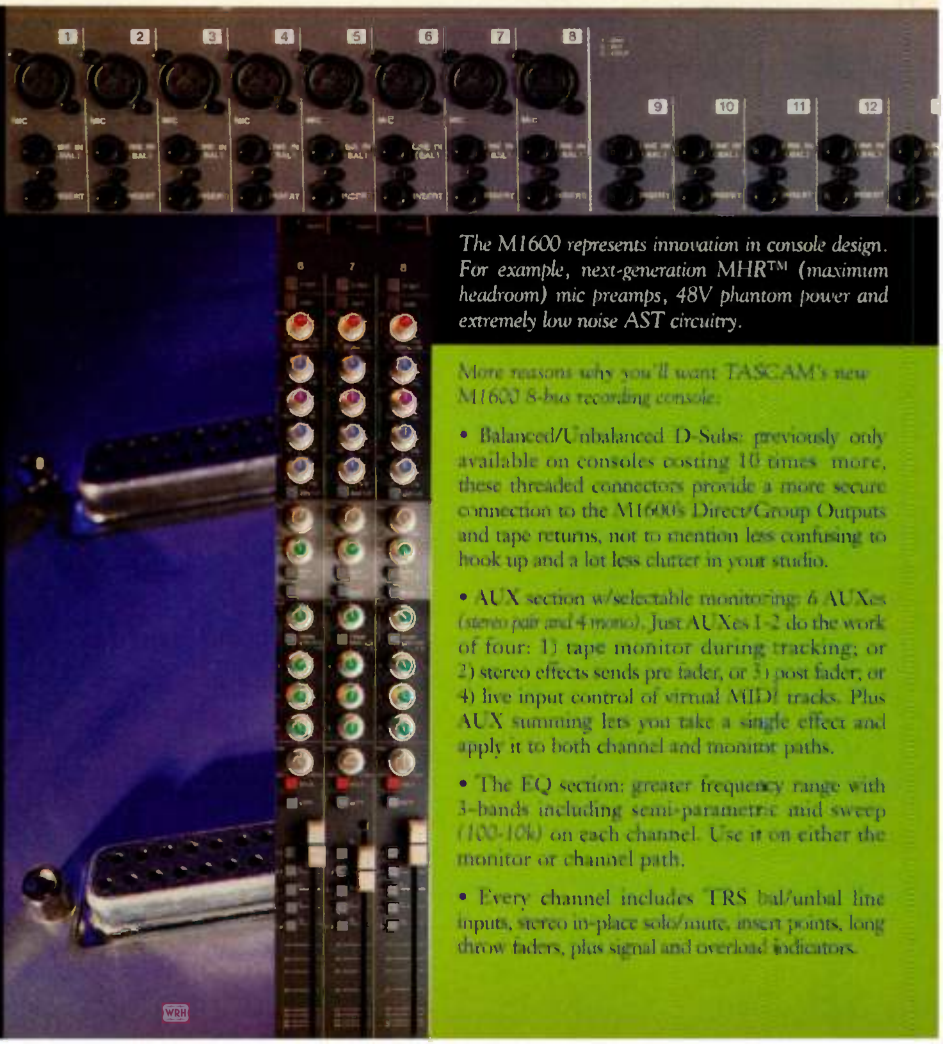
OAK-KAY!

Middle Atlantic now offers the new WSP-5 oak veneer side panels for the company's Slim-5 enclosures. Finished with a hand-rubbed stain and a protective polyurethane coating, the panels are available for any Slim-5 enclosure. Those ordered without doors and rear panels can be obtained in nonstandard sizes. Sold in pairs suitable for UPS delivery, the WSP-5 panels have suggested retail prices ranging from $216 to $333.50. For more information, contact Middle Atlantic, 8 North Corporate Drive, Riverdale, NJ 07457. Tel: 201-839-1011. Circle EQ free lit. #111.



FEELING SPOOKY

The Ghost L.E. console from Soundcraft boasts professional 4-band equalization with two fully parametric mids, individually switched phantom power and phase reverse, and a brand new mic amp. There are six mono and two stereo inputs, as well as multiple monitor outputs for different sets of speakers and headphones. Price is $4350. For more information, contact Soundcraft, distributed by Harman Pro North America, 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-227-1800. Circle EQ free lit. #112.



You'll

love it

for what

it does.

The M1600 represents innovation in console design. For example, next-generation MHR™ (maximum headroom) mic preamps, 48V phantom power and extremely low noise AST circuitry.

More reasons why you'll want TASCAM's new M1600 8-bus recording console:

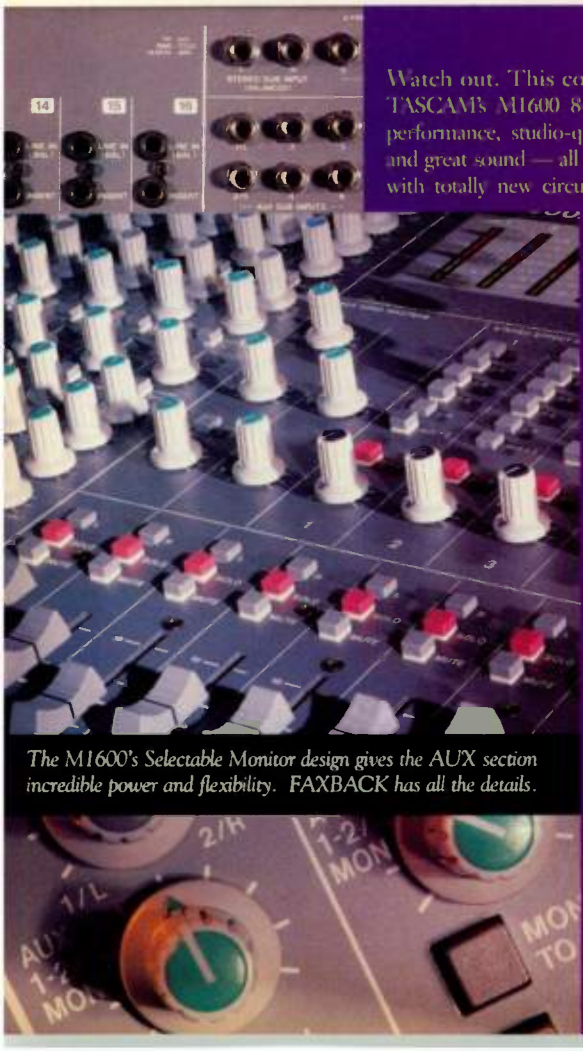
- Balanced/Unbalanced D-Subs: previously only available on consoles costing 10 times more, these threaded connectors provide a more secure connection to the M1600's Direct/Group Outputs and tape returns, not to mention less confusing to hook up and a lot less clutter in your studio.
- AUX section w/selectable monitoring: 6 AUXes *(stereo pair and 4 mono)*. Just AUXes 1-2 do the work of four: 1) tape monitor during tracking; or 2) stereo effects sends pre fader, or 3) post fader, or 4) live input control of virtual MIDI tracks. Plus AUX summing lets you take a single effect and apply it to both channel and monitor paths.
- The EQ section: greater frequency range with 3-bands including semi-parametric mid sweep *(100-10k)* on each channel. Use it on either the monitor or channel path.
- Every channel includes TRS bal/unbal line inputs, stereo in-place solo/mute, insert points, long throw faders, plus signal and overload indicators.

PLAY THE (NEAR)FIELD

Tannoy's System 600 and 800 nearfield monitors feature 90+ dB sensitivity and 150+ watts power handling. Coupled with the phase coherent Dual Concentric drive units is a new cabinet design that provides a clear line over the console. The frequency responses are 52 Hz–20 kHz and 47 Hz–20 kHz +/– 3 dB respectively. For more information, contact Tannoy/T.G.I North America Inc., 300 Gage Ave., #1, Kitchener, Ontario, Canada N2M 2C8. Tel: 519-745-1158. Circle EQ free lit. #113.

MIND YOUR MINIDISC

Following in the footsteps of its Portastudio predecessors, is TASCAM's new 4-track 564 Digital Portastudio. At the heart of the 564 is MiniDisc technology, which allows for instantaneous locate capability, combine, divide, and many other functions. Auto punch in/out with rehearsal, 3-band EQ with sweepable mids, two aux sends, four mono channels, four stereo channels, four balanced XLR inputs, and a rotary control are all standard fare with the 564. Additional features include a MTC output for sequencer lockup and full support for MMC (MIDI Machine Control). Each MiniDisc provides roughly 37 minutes of 4-track recording time. For more information, contact TASCAM, 7733 Telegraph Road, Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #114.



Watch out. This console is changing the rules. Simply put, TASCAM's M1600 8-bus recording consoles deliver the highest performance, studio-quality specs, slick recording-oriented features and great sound — all at prices about half of what you'd expect. Plus, with totally new circuitry and impressive signal flow flexibility, the M1600 is designed to work and interface easily with modular digital multitracks (like the DA-38) and hard disk recording systems. Sure, you can find other mixers comparable in price, but they sacrifice features, quality and value to get the price down. Not TASCAM. And whatever you do, don't let anyone tell you that a 4-bus live sound mixer will work fine in the studio. It won't. If you're into recording. Get into an M1600. The high-performance 8-bus that does what you want, for a price you can handle.

There's more, get your comprehensive 8-page FAXBACK document detailing all of the M1600s hot features, next-generation design, specifications and digrams. Options include an impressive meter bridge and the MA-8 mic preamp for additional XLR mic inputs. Or get to your dealer and get your hands on one today.

The M1600's Selectable Monitor design gives the AUX section incredible power and flexibility. FAXBACK has all the details.

TASCAM FAXBACK

GET THE FULL M1600 STORY NOW!
800 • 827 • 2268
REQUEST DOCUMENT #6610

WRH

You'll

buy it

for what

it costs.

($1,699*)

TASCAM.
Take advantage of our experience.

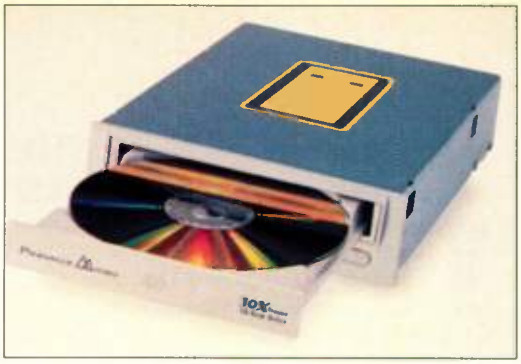
MSRP for *M1600/16. $2,199 for M1600/24

CIRCLE 64 ON FREE INFO CARD

EQ STUDIO WARE

XTREME MEASURES

Pinnacle Micro recently announced the first 10X speed CD-ROM drive for consumer and home markets. The 10Xtreme operates at a fast 1.5 MB per second data rate. With a suggested retail price of $239, the 10Xtreme ships with a free copy of *UP!*, a multimedia CD with 100 digital videos, and is available for use with any PC/AT or compatible computer. The 10Xtreme has an internal 5.25-inch half-height form factor. Interface cables are included with your purchase. For more information, contact Pinnacle Micro, 19 Technology, Irvine, CA 92718. Tel: 714-789-3000. Circle EQ free lit. #115.



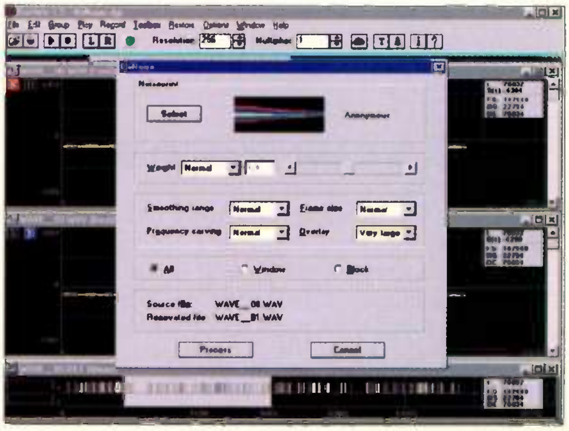
GOLLY G

MIDIMAN's MIDI GMan is a wavetable synthesizer module with an internal effects processor and is both GM- and GS-compatible. When used with a standard PC sound card MIDI cable or PC MIDI interface, GMan functions as an external wavetable synthesizer for any PC. For Mac users, MIDI GMan has a standard built-in 1 In/1 Out Mac MIDI interface. Other features include stereo mix in; a mic in and mic preamp that allows the GMan to work as a stand-alone studio/karaoke system; 1/4-inch and 1/8-inch stereo main, and line level outputs; and a retail price of $249.95. For more details, contact MIDIMAN, 45 W. St. Joseph Street, Arcadia, CA 91006. Tel: 818-445-2842. Circle EQ free lit. #117.

MIDI GMan SOUND MODULE
midiman

WITH A TRACE

Building on their original DART (Digital Audio Reconstruction Technology) software architecture, Tracer Technologies has introduced the improved DART PRO software package. Like the original, the DART PRO has been designed to remove clicks, pops, and surface noises from any Windows WAV file, but it also features DENoise and DEHiss capabilities, an updated Wave manager, and a spectrum analyzer. DART PRO has a retail price of $399. The original DART will still be available, and will carry a list price of $99. All current DART users can upgrade to DART PRO for $49. For more details, contact Tracer Technologies, 1600 Pennsylvania Ave. Unit 101, York, PA 17404. Tel: 717-843-5833. Circle EQ free lit. #116.


File Edit Group Play Record Toolbar Restore Options Window Help
Resolution
Multiplier
Select
Anonymous
Process
Cancel

Weight Normal
Smoothing range Normal
Frame size Normal
Frequency carving Normal
Overlay Very large
● All ○ Window ○ Block
Source file: WAVE__00.WAV
Recovered file: WAVE__01.WAV

E-MUSING ENHANCEMENTS

E-mu Systems' software version 1.20d incorporates several new features, along with some customary software maintenance enhancements. New features include SMDI (SCSI Musical Data Interchange) for quick file transfers over SCSI; eight new solo modes; new modulation and destination processors; six additional MIDI controller inputs; a view screen for Multimode; save sample as EIIIX format; and support for drives larger than 4 GB. Version 1.20 is currently shipping in all new EIV and e64 units, has been mailed to all registered EIV and e64 owners, and is available free of charge from authorized E-mu dealers worldwide. For more information, contact E-mu Systems, Inc., 1600 Green Hills Road, P.O. Box 660015, Scotts Valley, CA 95067-0015. Tel: 408-438-1921. Circle EQ free lit. #118.

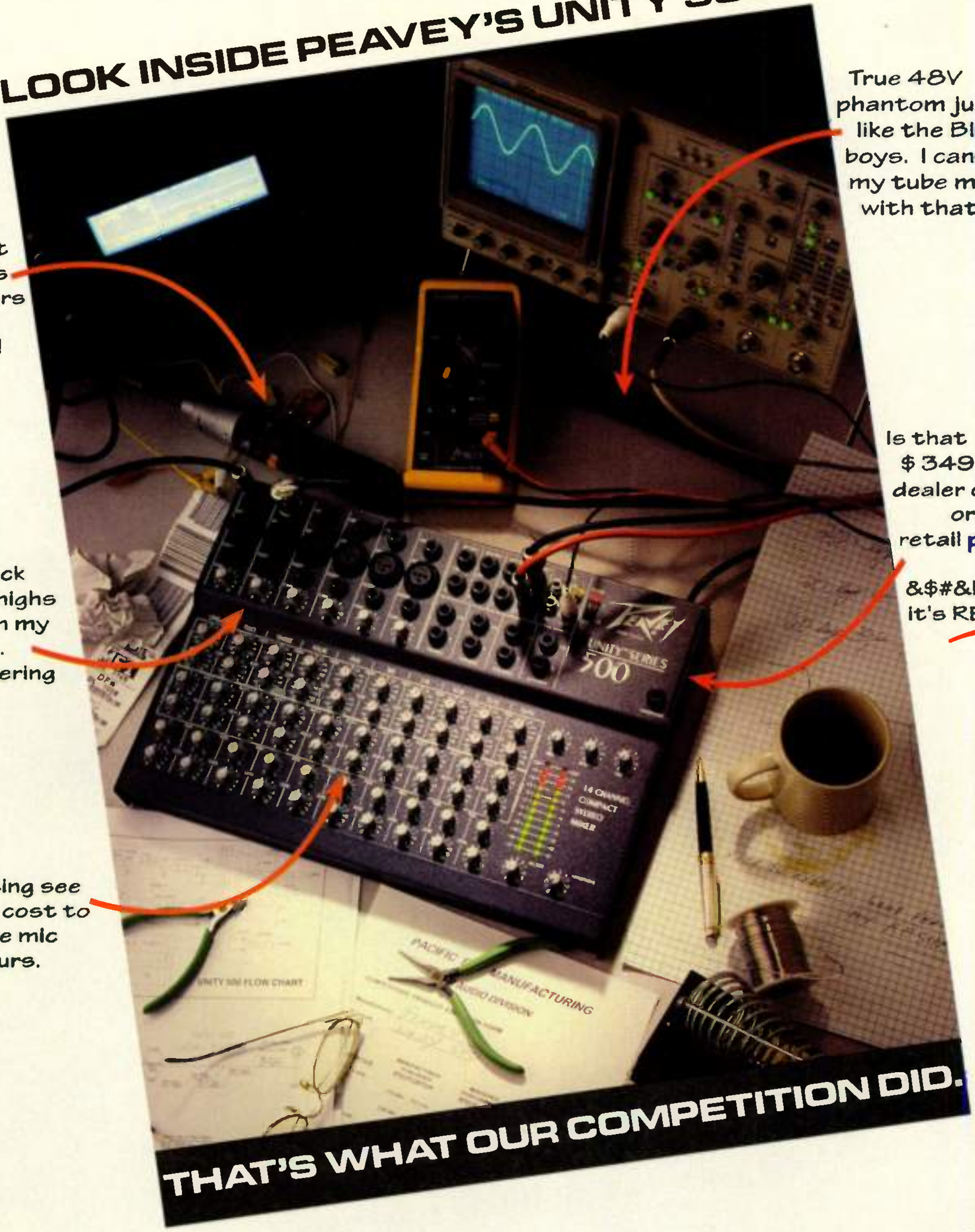
GET YOUR KICKS ON 66

The Capybara-66 is the Symbolic Sound Corporation's new sound processing and synthesis engine for its Kyma sound-design workstation. Due to software optimization and doubling of the clock speed, this new hardware provides more than twice the polyphony of the previous (Capybara-33) hardware. The Capybara-66 comes with 3 MB of sample RAM per card standard. All existing Capybaras are upgradeable. Each of the rack-mountable Capybara-66's eight expansion cards provides an additional Motorola 56002 DSP processor running at 66 MHz plus an additional 3 MB of sample RAM. For more information, contact Symbolic Sound, P.O. Box 2530, Champaign, IL 61825-2530. Tel: 800-972-1749. Circle EQ free lit. #119.

CAPYBARA·66

HOW DO YOU BUILD A HIGH PERFORMANCE MIXER FOR $349?

LOOK INSIDE PEAVEY'S UNITY 500...


Peavey
UNITY SERIES 500
14 CHANNEL COMPACT STEREO MIXER
UNITY 500 FLOW CHART
PACIFIC MANUFACTURING
AUDIO DIVISION

Have Rick look at that mic pre... It's quieter than ours and doesn't lose bass at full gain!

True 48V phantom just like the BIG boys. I can use my tube mic with that!

Is that $349 dealer cost or retail price?

&$#&!!! it's RETAIL!

The insert jack doesn't lose highs when I patch in my compressor... are they buffering the return?

Have accounting see what it would cost to add two more mic channels to ours.

THAT'S WHAT OUR COMPETITION DID.

BUT THEY STILL HAVEN'T FIGURED OUT THE $349 PART.

Peavey®

CIRCLE 48 ON FREE INFO CARD

The MONITOR Magazine is a publication filled with the latest information musicians want to know. To receive 4 issues for only $5 (price good in U.S. only) send check or money order to: Monitor Magazine, Peavey Electronics, 711 A Street, Meridian, MS 39301 (601) 483-5365 • Fax (601) 486-1278 http://www.peavey.com • AOL Keyword: Peavey • Compuserve Keyword: Go Peavey • ©1996

PRO TOOLS

Introducing the coolest upgrade path in all of digital audio.

Here's news for every musician, editor, producer, and engineer: The industry standard digital audio workstation—Pro Tools from Digidesign—now comes in a range of products tailored to your needs and budget. Now you can start with the all-new Pro Tools with DAE PowerMix™ for just $795. As your needs grow, you can climb all the way to the world's best-selling

now available for PCI-based Macintosh Systems
Pro Tools Project™
Pro Tools with AudioMedia II™
Pro Tools Software with DAE PowerMix™

New. An amazing value that turns your Power Macintosh or Mac-OS clone into a multitrack digital workstation with no additional hardware. Pro Tools interface. Random access, non-destructive editing. Up to 16 tracks of playback. Automated digital mixing with 2 bands of EQ per track.

This audio card adds 2 channels of high-quality analog and digital I/O, and comes with industry standard Sound Designer II™ software and entree to its family of DSP Plug-Ins.

New. Pro Tools software and Pro Tools Project Audio Card. Adds 8 tracks of simultaneous record/playback. Up to 8 channels of analog and digital I/O. Supports Sound Designer II and DSP Plug-Ins.

workstation, ProTools III, with mountains of record tracks, I/O, and real-time effects and mixing. Each step of the way, you'll learn and grow with Pro Tools software, share work between systems, and take an upgrade path that lets you build on the value of your investment. Audio professionals now have more choices and flexibility than ever before. And getting started couldn't be easier. To learn more about the clearest path to the best in digital audio, call **1-800-333-2137x251**.

Pro Tools® III

The ultimate workstation. TDM virtual digital mixing and processing environment accommodates a wide variety of real-time Plug-Ins. 16-48 tracks of record/playback. 8-64 channels of high-quality analog and digital I/O. New for '96: ProControl,™ an advanced tactile control surface with dedicated controls for mixing and editing, plus high-quality moving faders.

For audio professionals and musicians, as well as for more than 100 Digidesign Development Partners, Pro Tools is the industry standard. That's why more audio professionals use Pro Tools than all other digital audio workstations combined.

digidesign® AVID

A Division of Avid Technology, Inc.

©1996 Digidesign, a division of Avid Technology, Inc. All features and specifications subject to change without notice. Audiomedia II, ProControl, Pro Tools, and Sound Designer are trademarks or registered trademarks of Digidesign or Avid Technology, Inc.

CIRCLE 26 ON FREE INFO CARD

WRH

Little Guitars

Right Coast Recording captures the classic guitars of the Chinery Collection

G-MEN: Steve Howe (left) and Martin Taylor record the Chinery Collection of guitars at Right Coast.

STUDIO NAME: Right Coast Recording
LOCATION: Lancaster, PA
KEY CREW: Dave Wilkerson and Dave Natale
CLIENTS: Tina Turner; I.R.E. Irish Television; Voice of America; Bad Company; R.E.M.; Clair Brothers Audio; WHTZ-FM, NYC; Bell Atlantic; Bush; 20th Century Guitar Player; Yes; Billy Joel; WNEW-FM, NY; Steve Howe; KAO Optical CD Mastering; Kenny Rogers; Tino Gonzalas; the Chinery Guitar Collection; Martin Taylor
CONSOLE: Trident Series 24 (36x24x24)
MONITORS: Dynaudio LRM-1 and LRM-2a; BL LRM-2b subwoofer and L112; Yamaha NS-10M and NS-10
AMPLIFIERS: Phase Linear 700B [2] and 400 II; Rane HC-6 headphone amplifier; Crown D-60 headphone amplifier
RECORDERS: Alesis ADAT with BRC [32 tracks] plus AI-1 AES/EBU interface and AI-2 serial control/timecode interface
OUTBOARD GEAR: ADR F769x-R vocal stresser [2], PanScan panner; Eventide Instant Flanger and Instant Phasor [2], H910 Harmonizer [2], and H949 Harmonizer [2]; Lexicon 200 digital reverb [2], and 224 digital reverb [2]; Yamaha REV-5 digital reverb; dbx 160 limiter [4], 162 stereo limiter [2], 165 limiter [4], 902 de-esser [4], 903 limiter [4], and 904 gate [4]; Drawmer DS-201 dual gate; Mic Mix Dynafex gate [4]; Spectra Sonics 610 comp/limiter; UREI 1176 peak limiter [5]; Kepex II gate [12], Gain-Brain II limiter [2], Maxi-Q Parametric EQ; Court GE-60 stereo 1/3-octave EQ [2]; Amek 9098 Mic preamp/EQ; Apogee AD-500 A/D converter and DA-1000 D/A converter; SansAmp PSA-1 guitar preamp
MICS: AKG C-414EB [2], C-414B-ULS; beyer M88 [2], M160 [4], and M201 [2]; Bruel+Kjær 4007 [3]; Calrec CM-150; Milab DC-96 [2], LC-25 [3], and VM-41; Neumann KM84, U87Ai; RCA 44-BX; Sennheiser MD-421 [5], MD-441 [4], MKH 106, MKH 406 [4], MKH 416, and MKH 816; Shure SM57 [4], SM58 [2], Beta 58 [3], SM81 [4], SM91, and SM98A [4]; Sony ECM-969
STUDIO NOTES: The Right Coast Recording System is a recording studio/live broadcast audio facility that can be packed into just 18 road cases (1 console, 11 racks, and 6 cable and support equipment cases). All of the cases will fit through a standard doorway and can be set up by two people in approximately 3 hours. The system was designed as an alternative to the high cost of album/video production and for use in live recording any time a regular mobile unit is considered (or ruled out by impracticality or logistics). It's primarily set up as a tracking facility.
PRODUCTION NOTES: Wilkerson states: We used some of our rather unconventional microphones in recording *Masterpiece Guitars* for the Chinery Collection, a collection of over 1000 guitars (60 of which were used on the recording). The record featured Steve Howe of Yes and jazz guitarist Martin Taylor. We went through our stock of microphones and we generally ended up on strange microphones that captured a certain aspect of the guitar's sound. We ended up using a lot of Milab microphones on most of the tracks. The main ones were a pair of LC25's and a pair of DC 96's and those probably did at least 3/4 of the tracks.

After finding the right microphone, we put on a pair of headphones and moved the guitars and the mics around until it sounded just right. We'd record a little, play it back on the speakers, and see what it sounded like. We ended up, most of the time, with a stereo pair of whichever mics we were using. With one mic about halfway between the bridge and the sound hole right over the guitarists right wrist, and the other mic near the twelfth fret or so, about 4-12 inches away from the guitar. After we had the mics positioned, we would just have Martin or Steve turn slightly in their seats while they were playing and pick the sweet spot. On mixdown, we did a lot of fine adjustments on the pan-pots to make the image spread out the right amount and make the guitar sound like it was a real guitar in a real space. EQ

WRH

HAVE YOU HEARD THE NEWS ABOUT CAKEWALK PRO AUDIO?

"The results and underlying technology are astounding"

—Recording

"The unchallenged reign of the Mac in the pro audio world may be ending."

—Electronic Musician

"Awesome! Cakewalk Pro Audio takes top honors for its excellent all-around feature set and easy learning curve."

—New Media

"Cakewalk (Pro Audio)'s groove facilities are some of its most impressive features"

—Future Music

"Cakewalk Pro Audio...un produit fabuleux pour les musiciens"

—PC Loisirs (PC Leisure, France)

"A very good choice for professionals who work on a deadline and demand top performance"

—Electronic Musician

"Excellent—and user friendly—results."

—Musician

"A very powerful sequencer of MIDI data and audio that now makes hard disk recording a cakewalk"

—EQ

"The #1-Selling Music Software"

—Music and Sound Retailer, April 1996

Cakewalk Pro Audio
Cakewalk Pro Audio
Version 5
Rated Awesome NewMedia Magazine

THE WORD IS OUT.

Cakewalk Pro Audio™ is now the leading MIDI and digital audio workstation for Windows PCs. Cakewalk Pro Audio provides you with a unique balance of power, stability, and ease-of-use, letting you concentrate on *creating music*. (It's a quality you won't find in music software that is merely "ported" from the Mac platform.)

THIS NEWS JUST IN.

Cakewalk Pro Audio 5.0 is now available. It includes both a native Windows 95 version and a Windows 3.1 version on a single CD-ROM. Plus 40 new instrument definitions, improved editing functions, new MIDI+audio song files, on-screen Cakewalk tutorials, JAMMER® Hit Session™ accompaniment software, support for the Digidesign Audiomedia III™ card and Soundscape SSHDR1™ hard disk recorder, and more.

And, oh yes— *still* no copy protection. Unlike some software manufacturers, we don't treat our customers like suspected criminals.

SO SPREAD THE NEWS.

If you need integrated MIDI and digital audio recording, rock-solid SMPTE synchronization, and high-quality notation, then ask for the industry leader— Cakewalk Pro Audio.

Did we mention affordability? Cakewalk Pro Audio is only $399. (Deluxe edition $479; includes Musician's Toolbox CD-ROM.) For the name of a Cakewalk dealer near you, call 800-234-1171, or fax 617-924-6657

CAKEWALK
MUSIC SOFTWARE

WORLD WIDE WEB: *http://www.cakewalk.com* COMPUSERVE: TYPE GO CAKEWALK

CIRCLE 16 ON FREE INFO CARD

Sony C-48

There's more to this C than what you can see

MICROPHONE NAME: Sony C-48
TYPE OF MIC: Condenser
POLAR PATTERN: Omnidirectional, cardioid, or bidirectional
FREQUENCY RESPONSE: 30 to 16,000 Hz
SENSITIVITY: –41.0 dB (0 dB = 1 volt/Pa @ 1 kHz)
RATED SOURCE IMPEDANCE: 150 ohms @ 1 kHz
SIGNAL TO NOISE RATIO: 72 dB
DYNAMIC RANGE: 106 dB
MAXIMUM INPUT SPL: 128 dB
POWER REQUIREMENTS: 48 V phantom power or internal battery
DIMENSIONS: 2.25 (w) x 9.125 (l) x 1.625 (d) inches
WEIGHT: 20 ounces

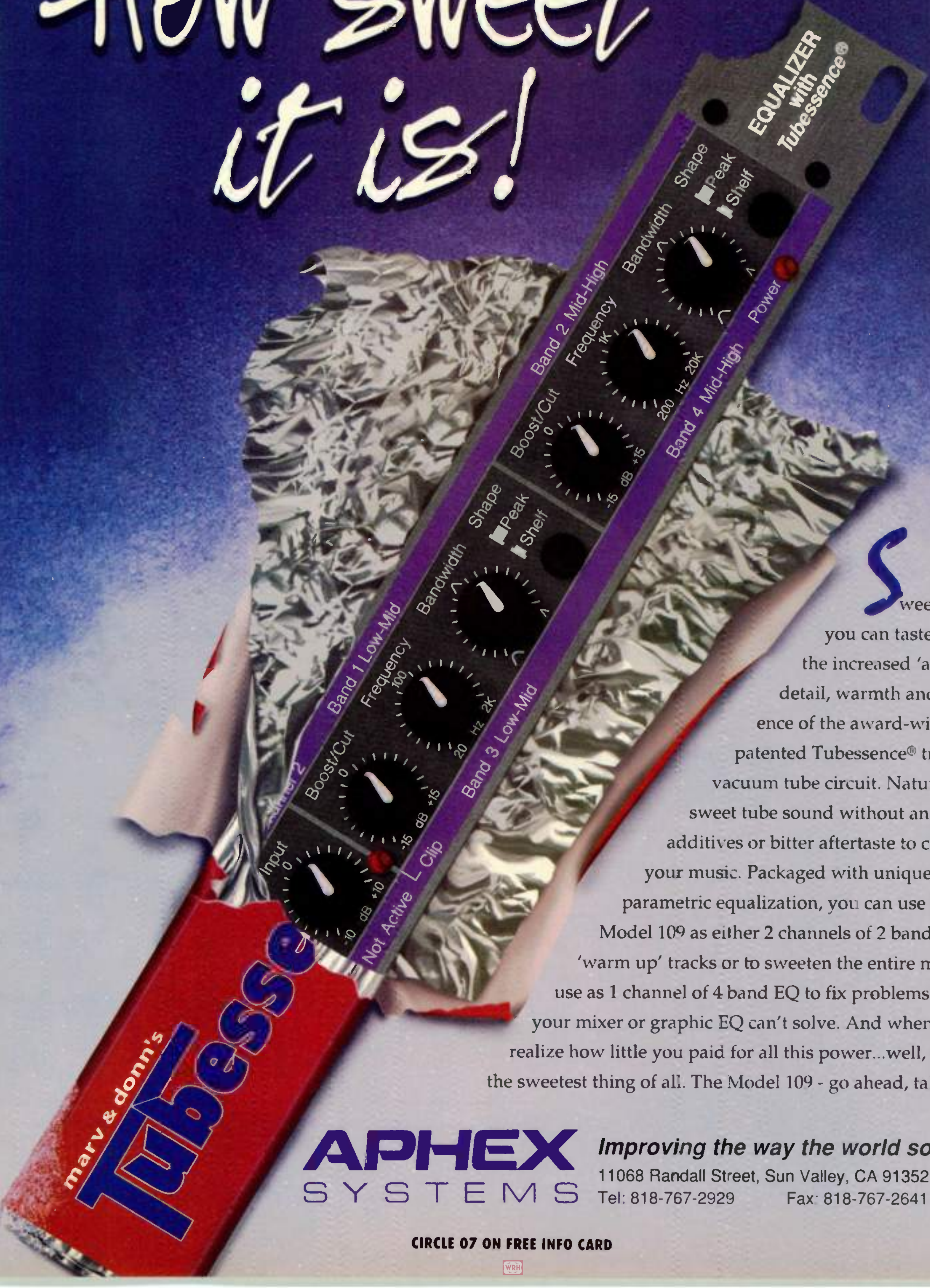
MIC NOTES: Hidden behind the Sony C-48's rear-panel trap door are three switches, one each for polar pattern selection, –10 dB attenuator and the third labeled "M V." That last one is a low-frequency cut switch designed to reduce bass buildup when recording vocals. In the "M" (music) position, the mic exhibits a flat response, while in the "V" (voice) position, the low-cut is active. In addition to standard phantom power, the C-48 can also be run (for as long as 50 hours) on an internal 9-volt battery. An On/Off switch at the bottom of the mic near the pivot will switch the battery power on, but will not affect operation of the mic with phantom power from a mixing console.

USER TIPS: Try the C-48 for miking a string instrument such as a cello. Place the mic about three feet in front of the player, but not directly in front — more like about 15 degrees off-axis. Use a height of about two and a half feet from the floor so that the mic is roughly pointing at one of the instrument's f-holes. If you find that the diaphragm is hearing excessive bass, switch in the low-frequency rolloff or angle the mic slightly either up toward the performer's head or down towards the floor. Although many engineers typically use a small-diaphragm mic for hihat, you might also try the C-48 for that purpose, especially on larger (15-inch and bigger) hihat cymbals. **EQ**

Photo by Edward Colver

WRH

How sweet it is!


EQUALIZER with Tubessence®
Shape
Peak
Shelf
Bandwidth
Frequency
1K
200 Hz 20K
Boost/Cut
0
-15 dB +15
Band 2 Mid-High
Band 4 Mid-High
Power
Band 1 Low-Mid
100
20 Hz 2K
Band 3 Low-Mid
Input
-10 dB +10
Not Active
Clip
marv & donn's
Tubesse

Sweetness... you can taste it with the increased 'air', detail, warmth and presence of the award-winning, patented Tubessence® true vacuum tube circuit. Naturally sweet tube sound without any false additives or bitter aftertaste to cloud your music. Packaged with unique, fully parametric equalization, you can use the Model 109 as either 2 channels of 2 band EQ to 'warm up' tracks or to sweeten the entire mix. Or use as 1 channel of 4 band EQ to fix problems that your mixer or graphic EQ can't solve. And when you realize how little you paid for all this power...well, that's the sweetest thing of all. The Model 109 - go ahead, take a bite!

APHEX SYSTEMS

Improving the way the world sounds℠

11068 Randall Street, Sun Valley, CA 91352
Tel: 818-767-2929 Fax: 818-767-2641

CIRCLE 07 ON FREE INFO CARD

TL AUDIO INTERNATIONAL DISTRIBUTORS

AUSTRALIA
ELECTRIC FACTORY
TEL +61 3 9480 5988
FAX +61 3 9484 6708

ASIA & FAR EAST
VW MARKETING
TEL +44 (0)1372 728481
FAX +44 (0)1372 724009

AUSTRIA
TON EICHENGER
TEL +431 4865 165
FAX +431 4865 165

BALTIC STATES
A & T TRADE
TEL +371 2 371141
FAX +371 2 370061

BELGIUM
AMPTEC
TEL +32 11 28 14 58
FAX +32 11 28 14 59

CANADA
SASCOM MARKETING GROUP
TEL +1 905 469 8080
FAX +1 905 469 1129

CYPRUS
EMPIRE MUSIC
TEL +357 2 49047
FAX +357 2 490563

DENMARK
DANISH AUDIO DISTRIBUTION
TEL +45 3968 2811
FAX +45 3965 2449

FINLAND
SOUND MEDIA LTD
TEL +358 0 510 2355
FAX +358 0 510 2257

FRANCE
MUSIC BUSINESS
TEL +33 1 43 38 15 95
FAX +33 1 43 38 70 79

GERMANY
GROOVE MUSIC (S.E.A.)
TEL +49 5903 93 880
FAX +49 5903 6141

GREECE
SOUND CONTROL S.A. AUDIO & VIDEO SYSTEM
TEL +30 1 8837 62930
FAX +30 1 8836 377

HOLLAND
AUDIO ELECTRONICS MATTIJSEN
TEL +31 20 699 04 80
FAX +31 20 699 36 41

ICELAND
B.F. PA SYSTEMS
TEL +354 1 121 44
FAX +354 1 612 144

INDIA
POST LOGIC
TEL +91 22 361 7550
FAX +91 22 363 3280

INDONESIA
MULTI AUDIO PERKASA
TEL +62 21 629 6009
FAX +62 21 629 8453

ITALY
PRODUX SRL
TEL +39 2 393 11571
FAX +39 2 393 12609

JAPAN
HOOK UP INC
TEL +81 35 256 2853
FAX +81 35 256 2856

KOREA
DAI KYUNG ELECT. TRADE CO
TEL +82 2 747 6187
FAX +82 2 766 8504

NEW ZEALAND
A2Z TECHNOLOGIES LTD
TEL +649 275 2085
FAX +649 275 1860

NORWAY
LYD SYSTEMER A/S
TEL +47 22 71 07 10
FAX +47 22 71 07 12

PORTUGAL
MUNDO MUSIC
TEL +351 2 200 4616
FAX +351 2 208 4949

C.I.S.
A & T TRADE
TEL +7 095 229 7516
FAX +7 095 956 6881

SINGAPORE/MALAYSIA
SWEE LEE COMPANY
TEL +65 336 7886
FAX +65 339 7035

SOUTH AFRICA
8TH AVENUE SOUND CC
TEL +27 11 792 3892
FAX +27 11 792 3895

SPAIN
REFLEXION ARTS
TEL +34 86 48 11 55
FAX +34 86 48 20 65

SWEDEN
ESTRAD MUSIC
TEL +46 8 643 20 07
OR +46 8 640 12 60
FAX +46 8 702 20 16

SWITZERLAND
ZAP AUDIO
TEL +41 22 340 05 70
FAX +41 22 340 05 75

SWITZERLAND
NAGRA BROADCAST
TEL +41 21 732 01 01
FAX +41 21 732 01 00

TAIWAN
TRUE SOUND TRADING CO. LTD
TEL +886 2 595 8512
FAX +886 2 594 0032

ADVANCETEK INTERNATIONAL CO LTD
TEL +886 2 719 2388
FAX +886 2 716 0043

THAILAND
MULTIMEDIA STUDIO
TEL +66 2 311 5111
FAX +66 2 311 6875

USA
SASCOM MARKETING GROUP
TEL +1 905 469 8080
FAX +1 905 469 1129

THOROUGHBRED PRODUCTS FOR PROFESSIONAL AUDIO

When you choose TL Audio you're getting a combination of superb design, quality manufacture and un-paralleled audio industry experience.

Our key personnel include individuals who have worked with Neve; (9 years research and development project leader), Trident; (11 years chief installation engineer and sales support installing the classic A-Range, B-Range and TSM consoles in many top studios worldwide), and Soundcraft; (5 years as UK Sales Manager).

All in all a total of 50 years sales and engineering experience in professional audio.

VALVE TECHNOLOGY

$1,595

EQ-1 Dual Valve EQ
2 channels x 4 band valve EQ, balanced mic & lines, +48v phantom power, front panel AUX input, bypass switch.

$795

VI-1 8 Channel Valve Interface
Line amp, balanced ins & outs, unbalanced compatible, level matching for -10dB & +4dB equipment.

$2,395

EQ-2 Stereo Valve Parametric EQ
4 band parametric, variable filters, mic-amps, +48v phantom power, dual mono or stereo linked modes.

$595

VI-S 8 Channel Switching Unit
8 channel switching unit for use with VI-1 Valve Interface. Offers switching between record and replay modes plus bypass.

$1,795

C-1 Dual Valve Compressor
Stereo valve compressor, balanced mic & line inputs, +48v phantom power, 2 AUX inputs, variable 'soft knee' compression.

$595

PA-2 Dual Valve Mic Pre-amp/DI
Mic & instrument inputs, peak LED, +48v phantom power, switchable sensitivity, variable gain control, rack ears included.

$1,695

PA-1 Dual Pentode Valve Pre-amp
Transformer coupled mic input, +48v phantom power, input/output gain controls, front panel instrument input, Phase reverse switch, Filters.

For UK sales: Tony Larking Professional Sales Ltd.
Letchworth, SG6 - 1AN (UK)
Tel: +44 (0)1462 490600 Fax: +44 (0)1462 490700

SASCOM MARKETING GROUP

Canada & USA:
Sascom Marketing Group
Tel: +1 905 - 469 8080
Fax: +1 905 - 469 1129

CLASSIC SERIES

TL Audio

TL Audio would like to thank all the professionals from around the world who have taken time out to express their thoughts about our equipment.

Stereo MCs *- "We found our previous choice of mixers to be unusable. The M-2 has a nice warm, fat sound that makes it easy to blend material - we don't have to spend half an hour EQ'ing to obtain a great sound."*

Mark King - Level 42 *- "The C-1 Compressor has a marvellously transparent sound that I find ideal for vocals... bright, sparkly and very impressive."*

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

Alex Marcou - Abbey Road Studios *(House recording engineer) - "The VI-1 makes hard sounding digital sound like cosy, rounded analogue - a joy to listen to. The control that the EQs, Pre Amps & Compressors give is excellent."*

M-1 8:2 Valve Mixer
4 band valve equalisation, balanced busses, valve mix amps, balanced outputs, Link facility providing 16, 24, 32, etc channels.

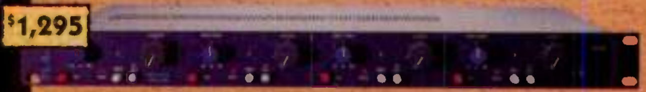
M-2 8:2 Valve Mixer
As the M-1 plus 100mm faders, 2 AUX's per channel, 2 stereo FX returns, channel direct outs switchable pre/post EQ & post fader, comprehensive link facility

INDIGO SERIES

NEW!

The new Indigo Series of valve products from TL Audio boasts the same critically acclaimed audio quality as the Classic range, but with an even more affordable price tag - making the unique characteristics of valves available to musicians and project studios for the 1st time.

Each unit comes in a compact 1U 19" package, and features the usual superb TL Audio build quality, un-paralleled sonic integrity, and, of course, that classic valve sound.



PA2001 4 Channel Valve Mic Pre Amp
Continuously variable input & output gain controls, 48v phantom power, 90Hz low cut filter, Phase reverse, Peak LED metering.

EQ2011 2 Channel 4 Band Valve Equaliser
Variable input gain, two channels x 4 bands equalisation, front panel AUX input, EQ bypass switch, peak LED metering.

EQ2012 2 Channel Parametric Valve Equaliser
Variable input gain, 'mono mode' allows mono 4 band operation, divide / multiply by 10 frequency switching, EQ bypass switch, peak LED metering.

C2021 2 Channel Valve Compressor
Fully variable control of input gain, threshold, ratio and gain make up, stereo link facility, 8 segment LED metering, side chain insert point.

O2031 2 Channel Valve Overdrive Unit
Continuously variable input and output gain, defeatable "Boost" level control, 3-band EQ, high cut filter, EQ bypass switch.

STILL AVAILABLE!

TL Audio Classic Neve EQ
Classic Neve EQ at an affordable price. For a fraction of the cost of new modules, TL Audio brings you 2 used classic Neve EQ modules, tested, refurbished and mounted in a sturdy 19" 1U case.
Stocks of Neve EQ modules will not last forever so unfortunately we can only supply this unit while we still have modules available.

For UK sales:
Tony Larking Professional Sales Ltd.
Letchworth, SG6 - 1AN (UK)
Tel: +44 (0)1462 490600
Fax: +44 (0)1462 490700

SASCOM MARKETING GROUP

Canada & USA:
Sascom Marketing Group
Tel: +1 905 - 469 8080
Fax: +1 905 - 469 1129

Andy Jackson - Pink Floyd *(Sound engineer) - "All the lead vocals on the "Division Bell" album mix were run through the EQ-1 - I certainly prefer the EQ-1 to other Valve Equalisers for vocals. The new EQ-2 is probably the best all-round EQ I've ever used."*

Carmelo Luggeri *(Songwriter / Producer - Kiki Dee) - "Both the EQ-1 Equaliser & C-1 Compressor add warmth to my digital system - the C-1 is subtle and warm without being intrusive, the EQ-1 makes everything sound better!"*

Ed Hopson - Lynyrd Skynyrd *(FOH Engineer & Production Manager) - "On lead vocals we replaced our existing valve compressor with the C-1 Compressor and the increase in intelligibility and signal quality was immediately noticed by all."*

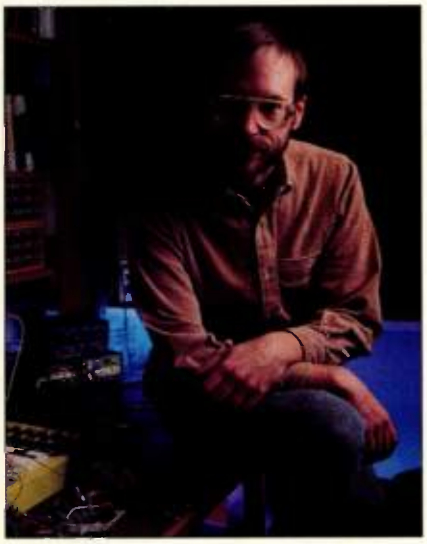
Dennis Charles & Ronnie Wilson - 1st Avenue *(Producers - Eternal, MN8, Michelle Gayle, Dana Dawson, Louise) - "The EQ-1 and C-1 units helped us put the power into the EMI album "Power of a Woman" by Eternal."*

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

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

CIRCLE 68 ON FREE INFO CARD

10 Tips for Guitar Multieffects



Some suggestions on getting a better processed guitar sound

BY CRAIG ANDERTON

The retro trend, along with the popularity of "alternative" music, has intensified the demand for great guitar sounds in the studio. Although the current infatuation with vintage effects has stolen a bit of the spotlight from guitar multieffects, don't sell these digital processors short. When properly programmed, they can emulate a great many "vintage" timbres, as well as create sounds that are extremely difficult to achieve with analog technology.

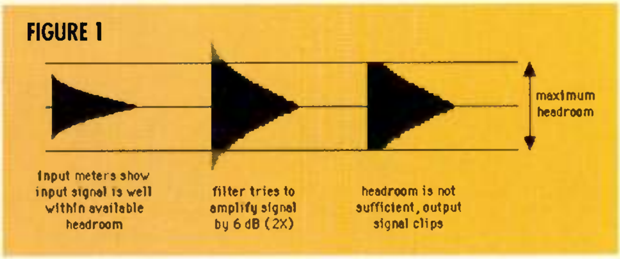


FIGURE 1
maximum headroom
Input meters show input signal is well within available headroom
filter tries to amplify signal by 6 dB (2X)
headroom is not sufficient, output signal clips

As with many other aspects of audio, there is no one "secret" that gives the ultimate sound; great sounds are often assembled, piece by piece. Following are ten tips that are designed to help you put together a better guitar sound using multieffects.

1. Don't believe the input level meters. Unintentional digital distortion can be nasty, so minimize any distortion other than what's created intentionally within the multieffects. The input level meters help you avoid input overload, but they may not tell you about the output. For example, a highly resonant filter sound (e.g., wa) can increase the signal level internally so that even if the original signal doesn't exceed the unit's input headroom, it can nonetheless exceed the available headroom elsewhere (fig. 1).

Some multieffects meters can monitor the postprocessed signal, but this isn't a given. If the distortion starts to "splatter," yet the meters don't indicate overload, try reducing the input level.

2. Use proper gain-staging — just like a mixer. While we're on the subject of distortion, if a patch uses many effects then there are several level-altering parameters, and these should interact properly.

Suppose an equalizer follows distortion. The distortion will probably include input and output levels, and the filter will have level boost/cut controls for the selected frequency. As one illustration of gain staging, suppose the output filter boosts the signal at a certain frequency by 6 dB. If the signal coming into the filter already uses up the available headroom, asking it to increase by 6 dB means crunch time. Reducing the distortion output level so that the signal hitting the filter is at least 6 dB below the maximum available headroom lets the filter do its work without distortion.

3. Add resonant peaks for realism. Speakers, pickups, and guitar bodies have anything but a flat response. Much of the characteristic difference between different devices is due to frequency response variations — peaks and dips that form a particular "sonic signature." For example, I analyzed some patches David Torn programmed for a multieffects and found that he likes to add 1 kHz boosts. On the other hand, I often add a slight boost around 3.5 kHz (possibly because I played a Fender Tele for quite some time and got used to that biting high end). With 12-strings, I usually cut the low end to get more of a Rickenbacker sound. Parametric EQ is ideal for this type of processing.

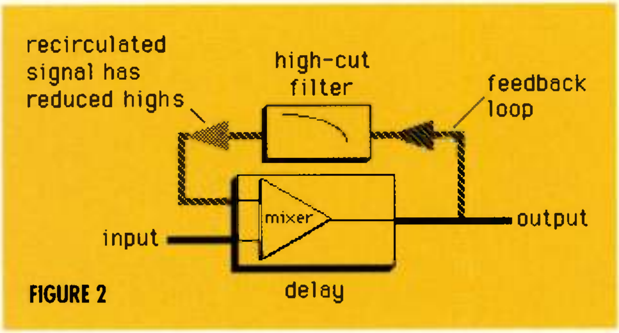


FIGURE 2

4. Use high-cut (lowpass) filtering in delay feedback loops. Each successive repeat with tape echo and analog delay units has progressively fewer high frequencies, due to analog tape's limited bandwidth (fig. 2). If your multieffects can reduce high frequencies in the delay line's feedback path, the sound will resemble tape echo rather than straight digital delay.

5. A solution for the tremolo-impaired. If your pre-retro craze multieffects doesn't have a tremolo, check for a stereo autopanner function. This shuttles the signal between the left and right channels at a variable rate (and sometimes with a choice of waveforms, such as square to switch the sound back and forth, or triangle for a smoother sweeping effect).

To use the autopanner for tremolo, simply monitor one channel and turn down the other one. The signal in the remaining channel will fade in and out cyclically, just like a tremolo.

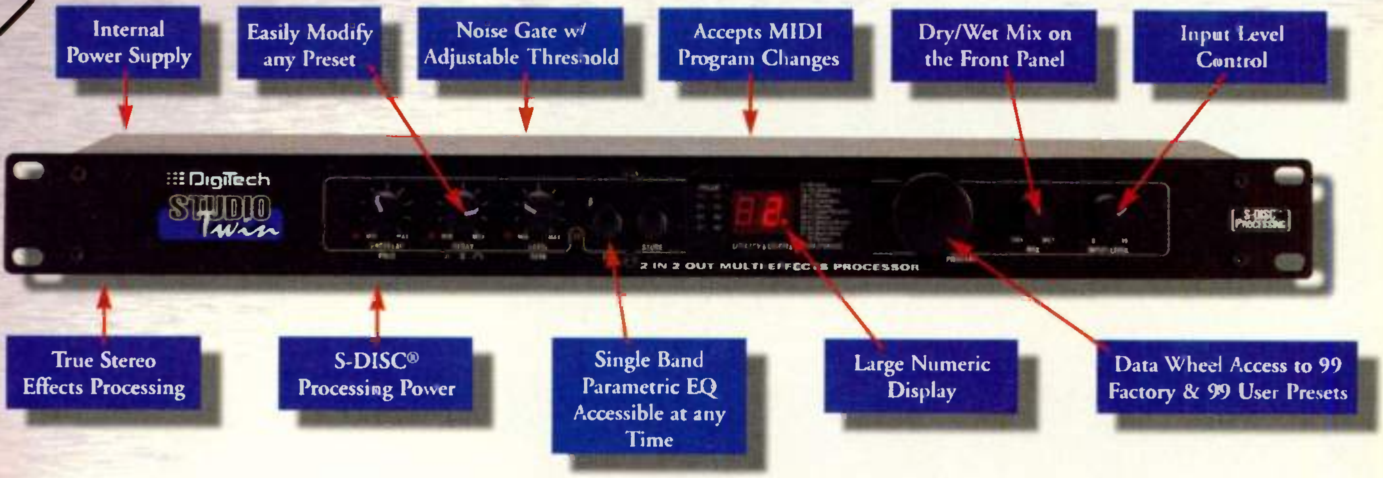
STUDIO TWIN

SIMPLE. POWERFUL. AFFORDABLE.

STUDIO Twin

PEAK
82.
01-09 Halls
10-18 Cathedrals
19-27 Plates
28-36 Chambers
37-42 Rooms
43-47 Gated Reverbs
48-53 Delays
54-61 Delays+Reverb
62-80 Mod+Reverb
81-99 Mod+Delay
00 Bypass
PGM CHANGE
UTILITY USER
OUT MULTI-EFFECTS PROCESSOR
PROGRAM
DRY
WET
MIX
0
10
INPUT LEVEL
S-DISC™ PROCESSING

You say you need a true stereo effects processor that's ideal for any application, a unit that is flexible enough to fit your unique situation, whether it is for sound reinforcement or studio applications. But it needs to fit your budget. Enter the Studio Twin Stereo Effect Processor. With 99 factory and 99 user presets, each with the 3 parameters you use the most at your fingertips, and a single band parametric EQ, it's **SIMPLE** to operate. The high performance, award winning SDISC® processing offers great sounding, high quality effects like True Stereo Halls, Cathedrals, Plates, Chambers, Rooms, Gated Reverbs single and multi-tap Delays, Chorus, Flanger, Detune,and Tremolo. **POWERFUL** Multi effects combinations like Mod+Delay, Mod+Reverb, or Delay+Reverb are also available. You can even process 2 independent mono sources through 2 separate effects. We also included a Noise Gate with an adjustable threshold, MIDI program change control, and an internal power supply. All these features packed into a single **AFFORDABLE** rackspace. Check out the DigiTech Studio Twin at you dealer today. Start sounding great tomorrow.


DigiTech
STUDIO Twin
82.
2 IN 2 OUT MULTI EFFECTS PROCESSOR
S-DISC PROCESSING

Internal Power Supply

Easily Modify any Preset

Noise Gate w/ Adjustable Threshold

Accepts MIDI Program Changes

Dry/Wet Mix on the Front Panel

Input Level Control

True Stereo Effects Processing

S-DISC® Processing Power

Single Band Parametric EQ Accessible at any Time

Large Numeric Display

Data Wheel Access to 99 Factory & 99 User Presets

DigiTech

H A Harman International Company

8760 South Sandy Parkway, Sandy Utah, USA 84070 • (801) 566-8919 • Fax (801) 566-7005 • Int'l Fax (603) 672-4246 • Visit DigiTech on the World Wide Web at http://www.digitech.com

CIRCLE 29 ON FREE INFO CARD

CALL
505.292.0341
For Price Quotes & Information!
800.444.5252
For Orders!
MICROPHONES
PROCESSING
MULTITRACK
CONSOLES
MIDI GEAR
GUITARS
TAPE
grandma's
music & sound
800 S-T JUAN TABO BLVD. NE / ALBUQUERQUE, NM 87123
505/292-0341 FAX 505/293-6184
WEB SITE / http://www.grandmas.com

I NEED MORE GEAR!

CIRCLE 82 ON FREE INFO CARD

Control the WARMTH with True Analog™
The ability to control audio warmth in the studio is priceless...
NEW TECHNOLOGY

True Analog™
Brilliance
Full Brite
Clean
Saturation
Soft Hard
Med
Warmth
AardScape
Bypass
Input
Drive
Power

...Especially when that warmth is based on actual analog tape characteristics. The breakthrough True Analog™ technology not only duplicates these characteristics, it lets you control them.
Full Control. Analog Tape Warmth. No Tape Hiss.
The AardScape: The most powerful analog processor available!

Aardvarks AD / DA
A perfect Companion!
Dealer Inquiries Welcome.
Aardvark
Ph 313•665•8899 • Fax 313•665•0694 • 202 E. Washington Ste 306 • Ann Arbor • MI • 48104
CIRCLE 01 ON FREE INFO CARD

6. Insert a high-quality preamp before the multieffects. Trying to squeeze four zillion effects into something the average human can afford is no easy task, so corners must be cut somewhere. Sometimes the input preamp will take the hit, which may result in more noise than desired, or an input impedance low enough to "dull" your guitar's sound. Adding a high-quality preamp onboard the guitar, or inline between the guitar and the cord feeding the multieffects, may give a cleaner, brighter sound.

7. Cabinet simulators are your friend, but...many multieffects have speaker simulators, which supposedly re-create the frequency response of a typical guitar speaker in a cabinet. If you're feeding the multieffects output directly into a mixer or PA instead of a guitar amp, and this effect is not active, the timbre will often be objectionably buzzy. Inserting the speaker emulator in the signal chain should give a more realistic sound. However, if you go through a guitar amp and the emulator is on, the sound will probably be much duller, and possibly have a thin low end as well — so bypass it.

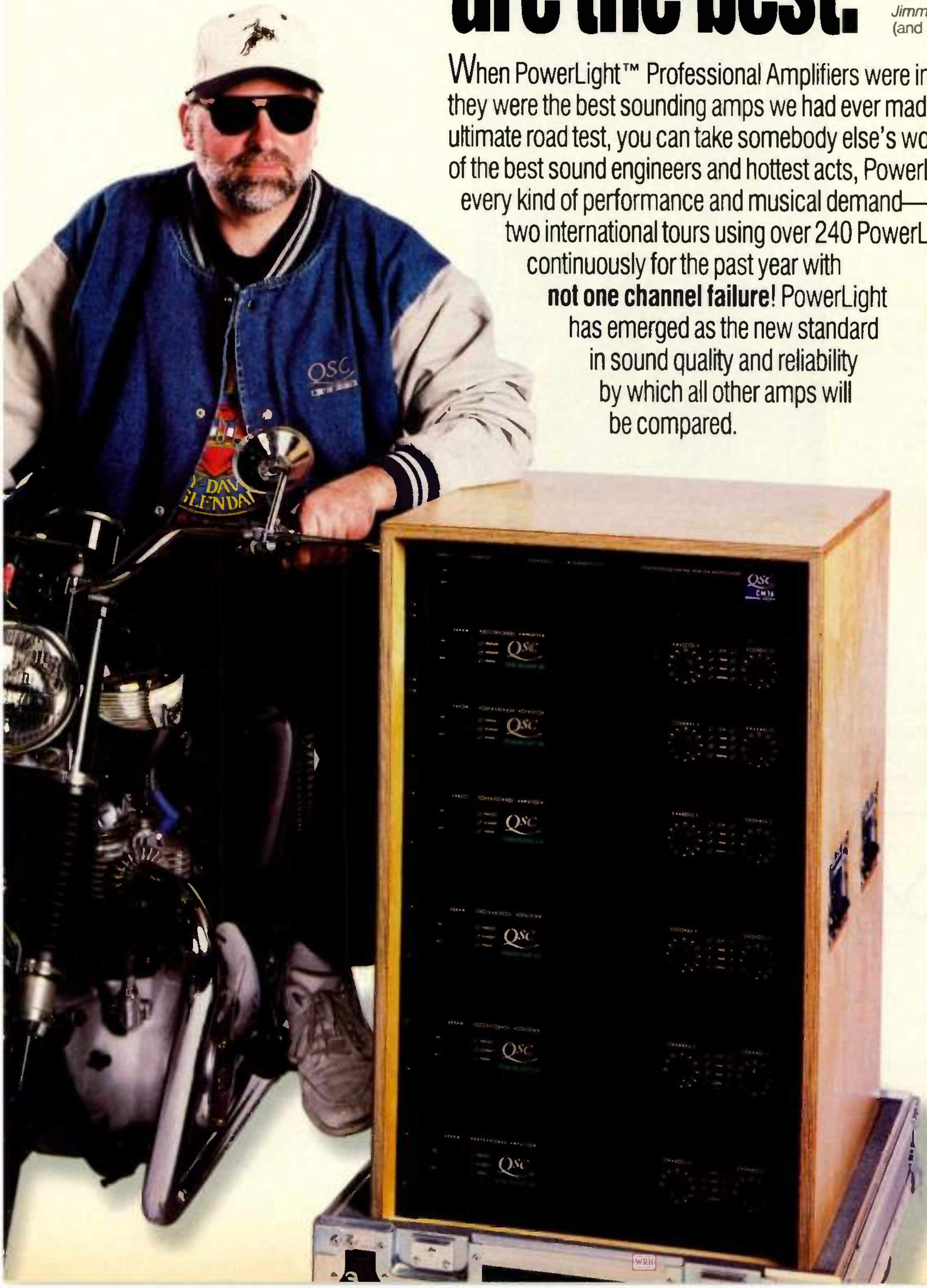
8. Use a MIDI continuous controller pedal for more expressive effects. A multieffects will generally let you assign at least one parameter per patch to a MIDI continuous controller number. For example, if you set echo feedback to receive continuous controller message 04, and set a MIDI pedal to transmit message 04, then moving the pedal will vary the amount of echo feedback. You can usually scale the response as well, so that moving the pedal from full off to full on creates a change that's less than the maximum amount. This allows greater precision, since the pedal covers a narrower range. Scaling can sometimes invert the "sense" of the pedal, so that pressing down creates less of an effect rather than more.

9. Make sure stereo outputs don't cancel. Some cheapo effects, and a large number of "vintage" effects, create stereo with time-delay effects by sending the processed signal to one channel and an out-of-phase version of the processed signal to the other channel. While this can sound pretty dramatic with nearfield monitoring, should the two outputs ever collapse to mono (e.g., playback over AM radio), the effect will cancel, leaving only the dry sound. To test for this, plug the stereo outs into a two-channel mono amp or mixer (set the channel pans to center). Start with one channel at normal

continued on page 144

"So, how 'bout the truth? I know quality, I know power, and I really know sound...PowerLights are the best."

Michael Adams
Live Sound Engineer, Sound Image
Jimmy Buffett and the Coral Reefer Band
(and Restorer of Classic Machines)



When PowerLight™ Professional Amplifiers were introduced in late '94, we said they were the best sounding amps we had ever made. Now that they've passed the ultimate road test, you can take somebody else's word for it. While on tour with some of the best sound engineers and hottest acts, PowerLight amplifiers have delivered on every kind of performance and musical demand—without missing a beat. In fact, two international tours using over 240 PowerLight 1.8's have been on the road continuously for the past year with **not one channel failure!** PowerLight has emerged as the new standard in sound quality and reliability by which all other amps will be compared.

4 PowerLight Models

Output Power in Watts per Channel

MODEL	8Ω*	4Ω*	2Ω**
PowerLight 1.0	200 Watts	325 Watts	500 Watts
PowerLight 1.4	300 Watts	500 Watts	700 Watts
PowerLight 1.8	400 Watts	650 Watts	900 Watts
PowerLight 4.0	900 Watts	1400 Watts	2000 Watts

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

What makes PowerLight amps work so well?

- *Refined "stepped linear" output circuits for optimum efficiency.*
- *PowerWave™ Switching Technology for tighter, fuller sound.*
- *Remarkable 2ohm load performance with unsurpassed thermal capacity.*
- *Extensive, proven protection circuitry, providing continuous fail-safe operation.*
- *Full compliance with worldwide safety and EMC requirements assures trouble free system integration.*
- *All PowerLights now include a data port for integration with QSC's computer controlled Network Audio Systems.*

For more details, call 714-754-6175.

QSC™
AUDIO

QSC Audio Products, Inc. 1675 MacArthur Blvd.
Costa Mesa, CA 92626-1468 **Ph** (714)754-6175
Fax (714)754-6174 **E-mail:** info@qscaudio.com
QSC WorldGroup BBS: (800)856-6003 or (714)668-7569
(In Canada) **S.F. Marketing** 6161 Cypihot St. Laurent,
Quebec, Canada H4S IR3 **Ph** (514)856-1919
Fax (514)856-1920

© Copyright 1996 QSC Audio Products, Inc. PowerLight, PowerWave, and Hear the Power of Technology are trademarks of QSC Audio Products, Inc. QSC and the QSC logo are registered with the U.S. Patent and Trademark Office.

CIRCLE 66 ON FREE INFO CARD

Power Management in the Studio

Learn to control your studio's power — instead of the other way around

BY ROGER NICHOLS

Spike, noise, surge, swell, transients, harmonics, and sag are not the names of members of a new alternative rock group; they are characteristic problems encountered in power management.

AC power is often the most overlooked area in recording studio design. If you were a farmer and your horse was your livelihood, you would probably pay attention to how well he is doing. AC power is the main source of your income, and also the primary cause of all the hums and buzzes you must deal with on a day-to-day basis. They say that if you build a better mousetrap that they will beat a path to your door. Well, just wait until you have the quietest studio in town and see how fast everyone wants to work there.

POWER QUALITY

Power quality can be measured by the duration vs. magnitude of a disturbance. Short fault durations, like transients, can damage sensitive electronic devices such as diodes, transistors, and ICs. Lower level transients slowly eat away at internal semiconductor junctions within electronic equipment, eventually causing failures.

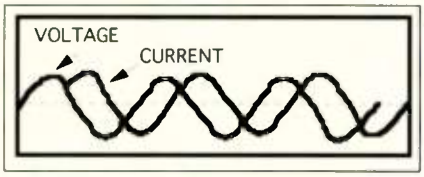


FIGURE 1

High-frequency noise can cause digital data errors in both digital audio and computer equipment, and can interfere with clock signals, causing timing errors and excessive jitter.

Voltage fluctuations affect motor operation and electronic equipment that require a steady power source.

POWER FACTOR

Electric utilities must generate the service capacity to meet the peak demand, kVA (kilovolt amps), whether or not the customer is using that current efficiently. Utilities can only charge for the active power, or kW (kilowatts).

The ratio of kW (active Power) to kVA (apparent power) is called the power factor.

PF=kW/kVA

Utilities now charge a penalty to companies when the power factor is low. This penalty can be avoided with the use of power-factor correction. Induction loads, such as induction motors used to power fans in air-handling systems, may operate at less than their full rated load because of poor power factor.

Under these conditions, the motor inductance causes the current to lag, or occur later in time than the applied voltage (fig. 1). Some portion of the current is doing the actual work demanded of the motor, kW, while some is supporting the reactive, inductive load. This is known as kilovolt Amps Reactive, or kVAR (fig. 2).

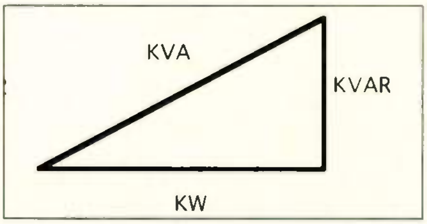


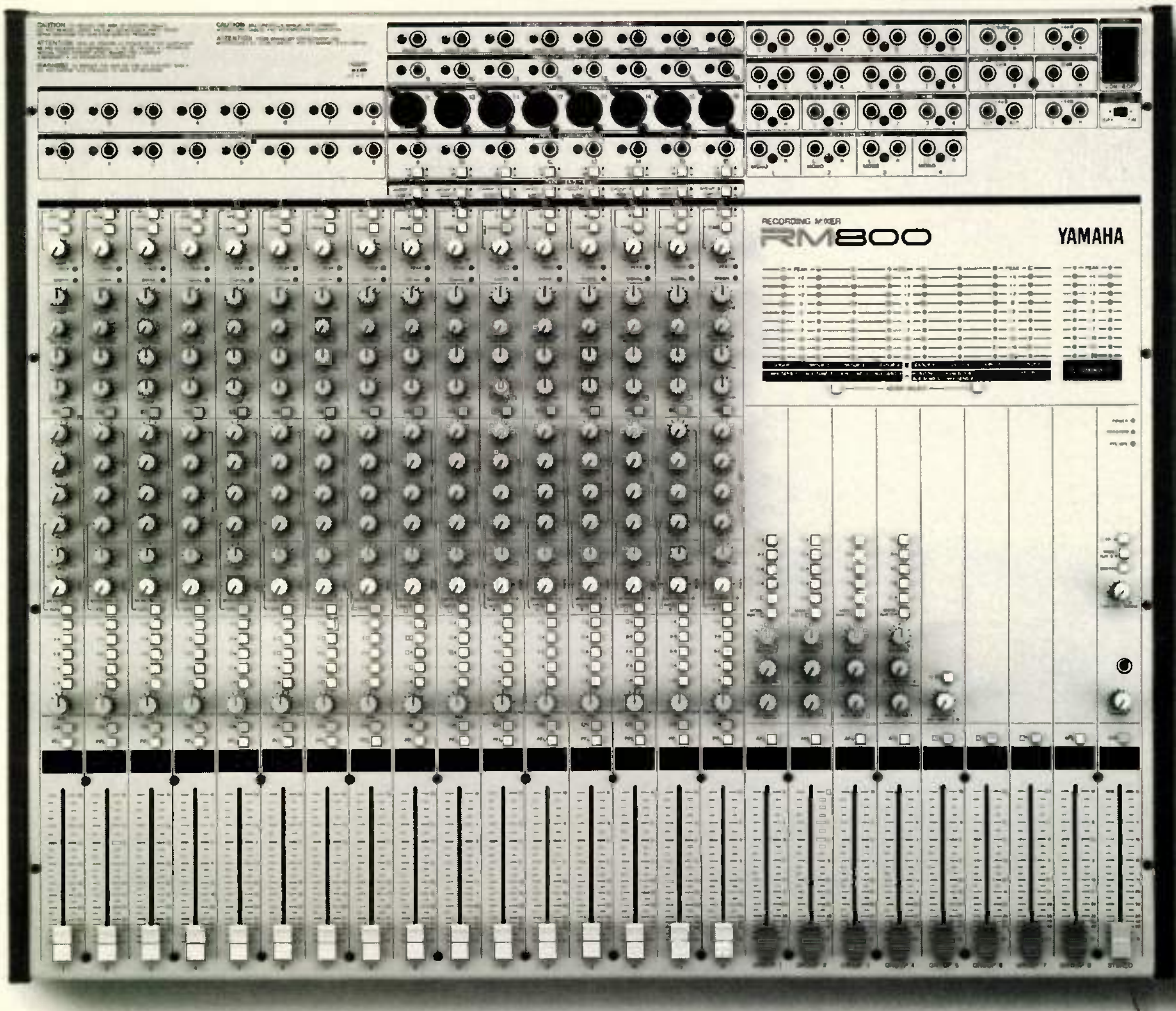
FIGURE 2

The ratio of the kW to kVA at the power line frequency of 50 or 60 Hz is known as power factor (PF), or displacement power factor (DPF) (fig. 3). The current is displaced in time from the voltage. This refers specifically to the phase shift, described as the cosine of the phase angle (phi). In these cases, apparent power, kVA, can be larger than active power, kW. Due to this phase shift of the fundamental current, the current must be larger to produce the same active power. In this way, kVA becomes larger because of this larger current.

Starting from an ideal sine wave with current in phase with the voltage, as the phase angle increases, the current waveform occurs later and increases to a higher current. The RMS current increase produces a higher apparent power. With linear loads, both the displacement power factor and total power factor change at the same rate as the phase angle changes. Apparent power can also be larger than active power when nonlinear loads are present. These loads produce harmonic currents that circulate back through the distribution system and the secondary of the dis-

WRH

A MIXER MADE FOR RECORDING AT A RECORD PRICE.



The Price Of Multitrack Recording Has Come Way Down. With the **Yamaha RM800** mixer and a digital multitrack recorder, you're in the game big time. Here's a true 8 bus multitrack console with 16 or 24 channels (providing 40 or 56 inputs in mixdown) for the price of a 4 bus. So now you can afford a dedicated recording board and forget about workarounds with your existing mixer. No wonder the RM800 has these great reviews:

“...You can't beat the combination of features and quality offered here.” “Clean and punchy...the RM800 does its brand name proud...” **Recording Magazine, May 1996**

“Sound...is exceptional (particularly the low noise and sensitive eq) for a board in this class.” “Inexpensive, great sound, very quiet, versatile.” **EQ Magazine, December 1995**

$1699*
16 channel
40 inputs

$2399*
24 channel
56 inputs

YAMAHA® RM800

Ext.
1-800-937-7171
600

Call for more information.

©1996 Yamaha Corporation of America, Pro Audio Products, P.O. Box 6600, Buena Park, CA 90622 (714) 522-9011.
Yamaha Canada Music Ltd., 135 Milner Avenue, Scarborough, Ontario M1S 3R1 (416) 298-1311. *Manufacturers suggested retail price.

CIRCLE 75 ON FREE INFO CARD

EQUI=TECH SYMMETRICAL POWER SYSTEM

The more you know about AC power, the better you will be able to cope with AC problems as they occur. The easiest problem to control is the most objectionable in the studio: ground noise. That's the point of this review. But before settling in to read this, read my article "Power Management in the Studio." It will help to explain why this review is here and why this system is important.

There is not much you can analyze about the Equi=Tech Symmetrical Power System, because there are no knobs, no meters, no adjustments of any kind. There is only a power switch on the front and some AC receptacles with circuit breakers on the back. The "guts" of the system is the specially wound, center-tapped toroidal transformer that takes the unbalanced power in and delivers balanced, 60 volt-to-ground power on the output.

All you have to do to install the Equi=Tech Symmetrical Power System is: plug it in to an AC supply, throw away all of your ground-lifting plugs, plug all of your equipment into the receptacles in the back, and turn-on the front-panel power switch. That's it. Nothing will hum, nothing will buzz, your studio will be the quietest thing you have ever heard...or not heard in this case.

I have been using an Equi=Tech unit for about nine months. As a result, I have had fewer digital errors when transferring signals between equipment. AES and S/PDIF work as well as optical now. On the analog side, my transformerless tube mic preamp is 15 dB quieter. As an average, all analog equipment has measured 12 to 16 dB quieter just because of the balanced power.

A few weeks ago I had to record some piano and vocal overdubs at a studio that does not use balanced power. On the piano, I was using a pair of Sony C800-G (the ones with the heat sink) microphones. On the vocal, I was using a prototype of the new Audio-Technica 4060 tube mic. Under normal circumstances, the electrical noise floor at the studio left something to be desired. I was about to change all of that.

I brought an Equi=Tech Symmetrical Power System with me to the session. I fed the outputs of the microphones into the mic inputs of the Apogee AD-1000 converter. The microphone power supplies and the Apogees were powered by the Equi=Tech. I then fed the digital signal from the Apogees directly to the digital input of the Sony 48-track digital machine. Since the signal was digital before it got to the studio's power environment, the signals stayed Equi=Tech quiet.

The difference was amazing! I could finally hear what fantastic microphones sound like. When referenced to a quiet ground, even the low-level noise that you usually associate with tube microphones was gone. I couldn't even tell if the mics were on until someone walked into the overdub room. This is the way recording was meant to be.

No matter what I plugged in, no matter how I interconnected the audio, I could not force a ground-related hum or buzz. This was always a problem in the past when someone wanted to bring in their own piece of audio gear to patch into the chain. Now I encourage it. *—Roger Nichols*

Price: Equi=Tech presently offers many models in each of three basic categories: Rack ($1399–$2779); Wall ($3959–$5359); and Portable ($3859–$4859). Models within each category furnish varying amp sizes, capacity, input lines, and options.

Contact: Equi=Tech Corporation, P.O. Box 249, Selma, OR 97538. Tel: 503-597-4448. WWW: http://www.equitech.com. Circle EQ free lit. #136.

tribution transformer. Harmonic current adds to the RMS value of the fundamental current supplied to the load, but does not produce any significant power. Using the definition for total power factor, the kW is essentially that of the fundamental only, while the kVA is made larger because of the higher RMS current.

Total power factor also includes the effects of any phase difference between the fundamental voltage and current. In many cases, when the distribution system is serving only single-phase receptacle loads, the phase difference at the fundamental is minimal. DPF is near 1.0 and PF represents the contribution of harmonics to the current. As the total harmonic distortion increases, the current waveform changes to a pulse with higher peak current. The RMS current increase produces a higher apparent power. The active power, or watts, and displacement power factor do not change since they are based only on fundamental voltage and current. Total power factor decreases. More current must be carried by the system to deliver the same amount of active power. The different responses of DPF and PF can lead the way to the proper power factor correction methods.

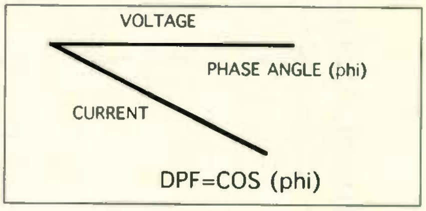


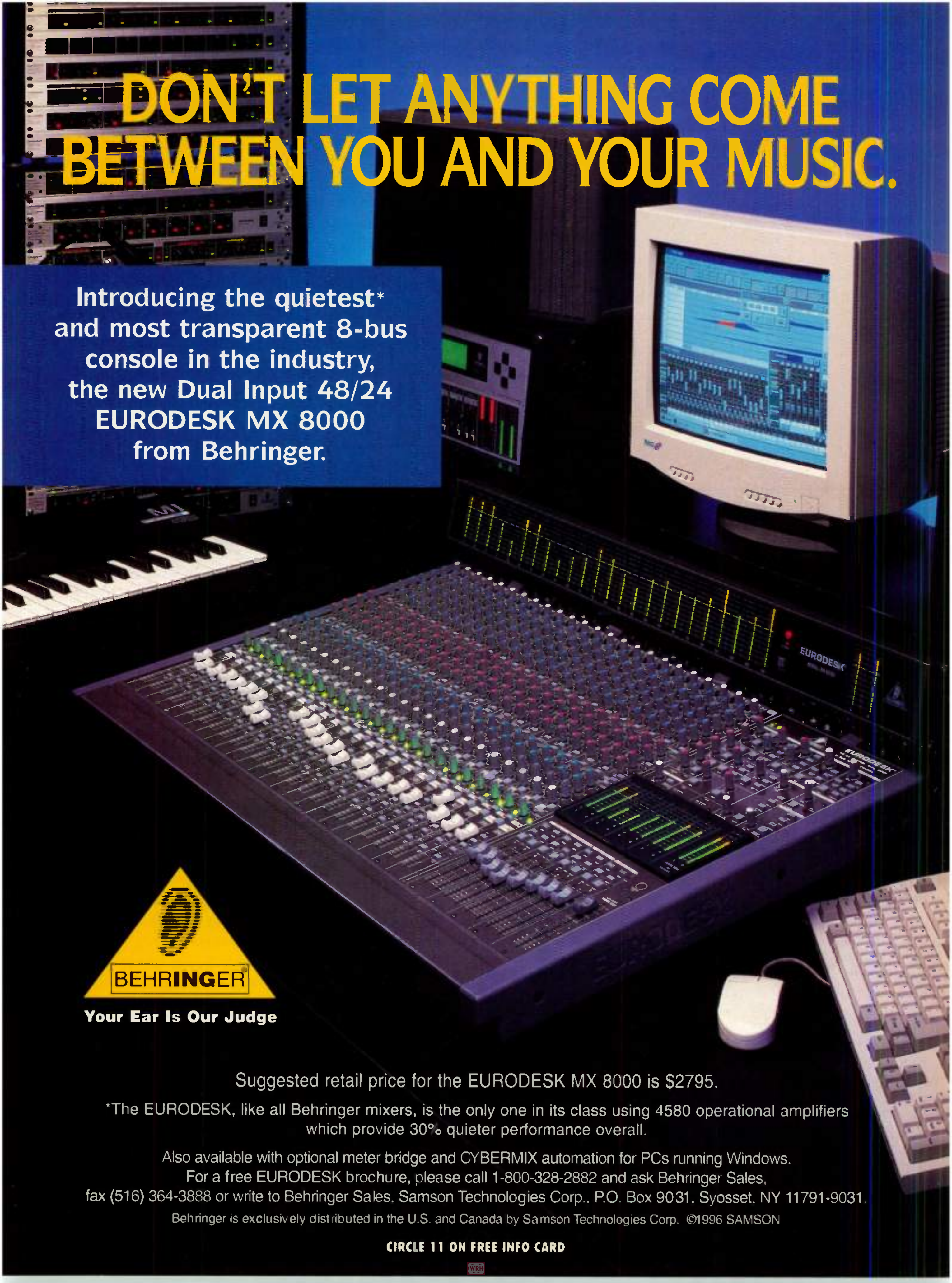
FIGURE 3

INDUCTION MOTORS

Induction motors can suffer from harmonic current heating if the supply voltage is distorted. And the presence of negative sequence harmonic currents reduces motor torque. The combination of these effects causes motors to burn out. To test the proper operation of the motor and its power factor, use a true RMS tool (such as the Fluke 8060, Fluke 73, πrotek 506, Wavetek 2030, Fluke 41B, Tektronix Wavemeter, and many others) to measure the three phases for proper voltage balance (fig. 4).

Look for obvious distortion in the waveform. Most motor manufacturers recommend less than 5 percent distor-

WRH



Introducing the quietest*
and most transparent 8-bus
console in the industry,
the new Dual Input 48/24
EURODESK MX 8000
from Behringer.

BEHRINGER

Your Ear Is Our Judge

Suggested retail price for the EURODESK MX 8000 is $2795.

*The EURODESK, like all Behringer mixers, is the only one in its class using 4580 operational amplifiers which provide 30% quieter performance overall.

Also available with optional meter bridge and CYBERMIX automation for PCs running Windows.
For a free EURODESK brochure, please call 1-800-328-2882 and ask Behringer Sales,
fax (516) 364-3888 or write to Behringer Sales, Samson Technologies Corp., P.O. Box 9031, Syosset, NY 11791-9031.

Behringer is exclusively distributed in the U.S. and Canada by Samson Technologies Corp. ©1996 SAMSON

CIRCLE 11 ON FREE INFO CARD

tion for a fully loaded motor. Measure the three phases for proper current balance, then measure power and power factor at full or normal load. If total power factor and displacement power factor are the same, you may need to add power factor correction capacitors. To minimize the effects of harmonics on induction motors, you can reduce the voltage distortion on the terminals by connecting the motor to a distribution center supplying only linear load. Or, you can consult with a power management expert and connect a harmonic filter at the source of harmonics.

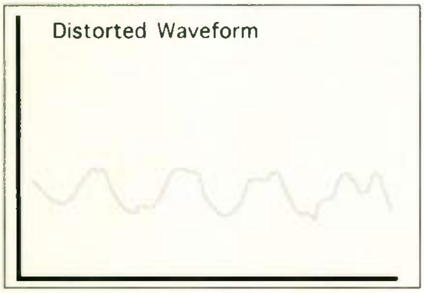


FIGURE 4

Capacitors installed to correct low power factor caused by induction motors can fail if harmonics are present. KVAR correction capacitors can form resonant circuits at frequencies above the fundamental. When combined with the inductive reactance of the distribution network this can cause premature motor failure due to excessive heat and random breaker tripping. This is normally not a problem if harmonics are not present. Harmonic currents produced by nonlinear loads may find a resonance involving the kVAR capacitor. The resulting high current may cause the capacitors to fail.

To verify proper circuit operation, measure the three phases for proper voltage and balance. Then measure the three phase power and power factor. Notice the difference between the DF and DPF readings. *If* the total PF reading is lower than the DPF reading, a portion of the load is probably nonlinear. Examine the drive current for harmonics, typically 5th and 7th. Adjustable speed drives are a common source of 5th harmonic. The need for correction capacitors may be reduced when adjustable speed drives are installed on existing motors. Line reactors can be applied at drive inputs to reduce harmonic currents. *Or* to avoid harmonic frequencies from resonating with correction capacitors, filter networks can be designed to detune the resonant system.

RECEPTACLE LOAD CENTERS

At the load center, harmonic currents can cause circuit breakers to trip. Thermal magnetic breakers may trip prematurely from excess heat in the panel caused by harmonic currents. Breakers may also trip erratically when nonlinear currents with high peak values are present. A peak-sensing circuit breaker responds to the peak of the current waveform. Since the peak may be higher due to harmonics, this type of breaker may also trip prematurely at a lower RMS current.

To detect harmonics at a load center, check the phase voltage for flat-topping (a condition where instead of a sine wave, the waveform becomes flat on top resembling digital clipping).Then measure the current in the feeder conductors using a true RMS instrument. Remember that these instruments indicate the actual heating value of the current, including harmonics. Verify that you are operating within the load rating of the panel. Measure the feeder neutral current. If it reads high, triplen harmonics (see below) may be present. Then compare the current with the ratings for the conductors, lugs, and buss bars. Compare the individual branch circuit currents to the breaker ratings. Check the branch neutrals for overloads due to triplen harmonics (see below). The same process can be repeated at other load centers fed from the same source.

Once you are sure that a receptacle panel is effected by harmonics, there are a few options to correct the situation:

$$\text{THD}=\frac{\text{rms value of Harmonic current}}{\text{Fundamental}}$$

FIGURE 5

- Balance load. Rearranging branch circuits and reduce the neutral current.
- Redistribute load to other existing or new panels.
- Zero Sequence Harmonic Filters can be connected to the panel to reduce neutral current in the feeder.

PARTICIPATING DEALERS

• **AHO Music**, Middletown, NY • **Al Nalli Music**, Ann Arbor, MI • **AMS**, Paramus NJ, • **Andy's Music**, Chicago, IL • **AST Sound**, NYC, NY • **Audio Image**, Columbus, OH • **Audio Images**, San Francisco,CA • **Audio Light & Music**, Norfolk, VA • **Boynton Studio**, Morris, NY • **Brownell Sound**, Portland, OR • **Cape Cod Audio**, Hyannis, MA • **CCI**, Olympia, WA • **Cecil Electronic Systems**, Ft. Collins, CO • **Century Music**, San Antonio, TX • **Cintioci Music**, Philadelphia, PA • **Corner Music**, Nashville, TN • **Country Music**, San Antonio, TX • **Crouse-Kimzey Co**, Grand Prairie, TX • **Daddy's**, Salem, NH • **DJ's Pro Audio/Video**, Phoenix, AZ • **DJ's Rock & Roll**, Berwyn, PA • **Dr. Sound**, NYC, NY • **Dynamic Pro Sound**, Panama City, FL • **E. U. Wurlitzer**, Boston, MA • **East Coast Music**, Danbury, CT • **Eighth Street Music**, Philadelphia, PA • **Full Compass Systems**, Middletown, WI • **Gand Music**, Northfield, IL • **George's Music**, Berwyn, PA • **Guitar Center** • Arlington, TX • El Cerrito, CA • Boston, MA • Brea, CA • Burbank, IL • Chicago, IL • Arlington Heights, IL • Covina, CA • Dallas, TX • Los Angeles, CA • Houston, TX • Lawndale, CA • Roseville, MI • Fountain Valley, CA • Santa Anna, CA • San Bernadino, CA • San Diego, CA • San Francisco, CA • San Jose, CA • **H & N Music**, Waynesboro, PA • **ICB Audio**, Cincinati, OH • **Magic Audio**,Orlando, FL • **Manna Music**, Bellingham, WA • **Manny's Music**, NYC, NY • **Medley Music**, Bryn Mawr, PA • **Midwest Sound & Lighting**, Lincoln, NE • **Music Arts Ent.**, Ft. Lauderdale, FL • **Music Box II**, Clinton Township, MI • **Musically Yours**, Rochelle Park, NJ • **Pastore Music**, Union City, NJ • **Performance Audio**, Salt Lake City, UT • **Portland Music Co**, Portland, OR • **Pro Audio Supply**, Fort Worth, TX • **Pro Audio Warehouse of Timonium**, Timonium, MD • **Rainbow Guitars**, Tucson, AZ • **Reliable Music**, Charlotte, NC • **Rice Music**, Colorado Springs, CO • **Rich Music Etc., Inc.**, Denton, TX • **Richmond Music Center**, Richmond, VA • **Robb's Music**, Boulder, CO • **Russo Music Center**, Trenton, NJ • **Sam Ash Music** • Brooklyn, NY • White Plains, NY • Forest Hills,NY • Carle Place, NY • Huntington Station, NY • Cherry Hill,NJ • Edison, NJ • Paramus, NJ • New Haven, CT • Miami, FL • Margate, FL • NYC, NY • **Sound Productions**, Dallas, TX • **Stage Sound**, Roanoke, VA • **Sweetwater Sound**, Ft. Wayne, IN • **The Music Place**, Berlin, NJ • **The Woodwind & The Brasswind**, S. Bend, IN • **Thoroughbred Music**, Clearwater, FL • **Thunder & Lightning**, Berlin, CT • **Veneman Music**, Springfield, VA & Rockville, MD • **Washington Music**, Wheaton, MD • **Wray Music House**, Lemoyne, PA

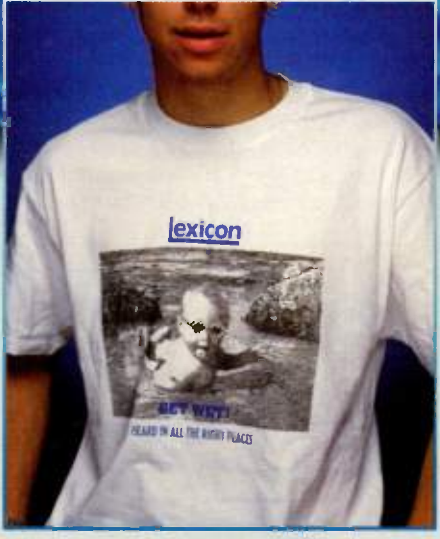
Creative control, superlative sound and uncompromising support — Lexicon's commitment to the audio professional..

PERFORMANCE SERIES

Here's Three Very Cool Ways to Get Wet This Summer

Alex
DIGITAL EFFECTS PROCESSOR
16
lexicon
Reflex
128
lexicon

Cool Way #1: *Alex™ offers Lexicon's legendary digital reverb & effects processing in a remarkably affordable package. There's* ***16 phenomenal presets*** *including numerous superb reverb programs with halls, rooms, plates, gates — even an inverse room. For preset tweaking, there's up to 3 adjustable parameters (over 4,000 effects combos!) — and another 16 user registers for storing your own unique patches. Alex is stereo In & Out and also features multi-voice chorusing, flanging, straight echoes & stereo multi-tap delays.* **Cool Way #2:** *Reflex™ is our Dynamic MIDI® reverberator — it goes beyond Alex with new effects like randomizer and early reflections, tunable chromatic resonator...and full Dynamic MIDI implementation (with up to 4 patches/effect). Reflex offers an advanced programming mode and MIDI Auto Tempo for synchronizing delays to MIDI. Visit your participating "Get Wet" Lexicon dealer now (see list at left) and check-out the really cool summer deal$ on Alex and Reflex - but only while supplies last.*



Cool Way #3

Get your own "Get Wet! Classic Lex T"

For a limited time only. "Get Wet" by following the instructions in the coupon.

lexicon

Heard In All The Right Places

Tel: 617/736-0300 Fax: 617/891-0340
E-Mail: 71333.434@compuserve.com

A Harman International Company

CIRCLE 41 ON FREE INFO CARD

GET WET!

Order your own "Get Wet" T-shirt. Call: 1 (800) 924-4950 — or send us this coupon (please print legibly!)

Name________________

Address________________

City__________ State____ Zip____

Phone (   )____________

Size (check one) Large ☐ Xtra-large ☐

Price: $13.95 U.S. (includes shipping & handling). Please allow 2-4 weeks for delivery. To place a credit card order call: 1 (800) 924-4950. Money Orders also accepted. Offer valid in U.S.A. only while supplies last. Send coupon to: Lexicon Get Wet T Offer 100 Beaver St. Waltham, MA 02154

LEARN THE ART OF RECORDING

You can get the practical, real-world skills needed to successfully start your career as a recording engineer, producer or studio musician. •Hands-on approach, learning by doing •Previous experience not required •Complete 300 hours of training in less than 2 months •6 studios filled with the latest equipment •Small classes, excellent personal attention •Job placement assistance •Financial aid available •Low cost, on-campus housing

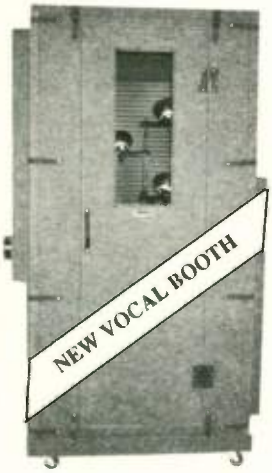
For free brochure, call or write today

1-800-848-9900 1-614-663-2544

THE RECORDING WORKSHOP
455-Q Massieville Rd
Chillicothe, Ohio 45601

Ohio State Board of Proprietary School Registration #80-07-0696T

CIRCLE 67 ON FREE INFO CARD



WhisperRoom INC.
Sound Isolation Enclosures

Sound Isolation Rooms
Vocal Booths
Amplifier Isolation Enclosures
Practice Rooms

Tel: 423-585-5827 Fax: 423-585-5831
116 S. Sugar Hollow Rd.
Morristown, TN 37813 USA

CIRCLE 72 ON FREE INFO CARD

Filters should only be installed after consulting with a qualified engineer.

If the neutral conductor is overloaded, a larger conductor will be required by code, or the existing receptacle panel can be replaced by a panel and main breaker that is rated for nonlinear loads.

LIGHTING LOAD CENTERS

Excess heat caused by harmonics in a lighting circuit conduit can cause conductor insulation to fail. In energy-saving electronic ballasts with solid-state power supplies, the phase and neutral currents can contain harmonics. Existing standards for the number of conductors in a conduit don't always account for the heat caused by these harmonics. To find harmonic overloads in lighting circuits, you can make the same measurements you made at the receptacle load center. Measure the current in the feeder neutral. If the levels are high, compare the measured currents to the ratings of the conductor, lugs, and buss bars. Feel the conduit for excess heat. To determine the overall level of harmonics, measure the total harmonic distortion in the phase currents. The THD generally refers to the RMS value of all the harmonic currents, divided by the fundamental (fig. 5). The total harmonic distortion may be a problem if it exceeds 20 percent.

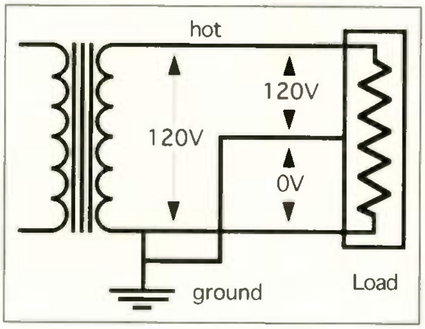


FIGURE 6

To prevent harmonics from effecting a lighting load center, specify fewer conductors per conduit. Or you can install new high-performance ballasts that produce lower harmonic currents and also improve Power Factor.

AC HARMONICS

Harmonics on the AC line are usually caused by nonlinear electrical loads. Some of these nonlinear loads are: personal computers, certain types of lighting ballasts, electronic studio and office equipment, and adjustable-speed motor drives. These devices draw nonsinusoidal current in abrupt pulses when connected to a sinusoidal voltage source. These pulses form a distorted current waveshape that contains harmonics.

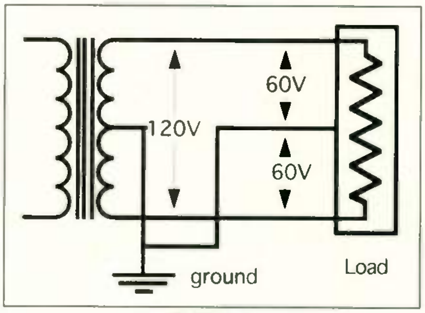


FIGURE 7

The harmonic current drawn by nonlinear loads acts in an Ohm's law relationship with the source impedance of the supplying transformer to produce voltage harmonics. The source impedance includes the supplying transformer and branch circuit components. For example, a 10-amp harmonic current being drawn from a source impedance of 0.1 ohm will generate a harmonic voltage of 1.0 volt. Any load sharing this transformer or branch circuit can be affected by the voltage harmonics generated.

Computers used in console automation or hard-disk recording can crash or reset from excessive harmonic voltages in the supply power. Remember, the harmonics can come from devices anywhere on the same transformer or branch circuit.

Each harmonic has a name, frequency, and sequence. The sequence refers to the phasor rotation with respect to the fundamental. In an induction motor, for instance, a positive sequence harmonic would generate a magnetic field that rotated in the same direction as the fundamental. A negative sequence harmonic would rotate in the reverse direction. See Table 1.

TABLE 1

NAME:	F	2nd	3rd	4th	5th	6th	7th	8th	9th
FREQ:	60	120	180	240	300	360	420	480	540
SEQ:	+	-	0	+	-	0	+	-	0

Zero sequence harmonics are called "Triplens." These are odd multiples of the 3rd, such as 3rd, 9th, 15th, 21st, etc.

A simple way to determine the extent of harmonic distortion caused by a single-phase nonlinear load would be to make two separate current measurements. Make the first measurement using an average responding current clamp or meter with clamp on probe. Make a second measurement of the same circuit using a true RMS current clamp meter. Divide the results of the first measurement by the second measurement. This will give you the A/R ratio. A ratio of 1.0 would indicate little or no harmonic distortion. A ratio of 0.5 would indicate substantial harmonic distortion. This test method works because an averaging meter will read a true sine wave correctly, as will the true RMS meter. If the waveform is distorted, the true RMS meter will read correctly, while the averaging meter will read up to 50 percent low, depending on the amount of distortion.

The above measurement method is not a substitute for a harmonic analyzer, but it is a simple way to determine if there is a need for more sophisticated equipment.

GROUNDING AND NOISE

As you can see by the material that has been covered, AC power contains more than just that pure mythical 60 Hz sine wave that you read about in text books. In most cases, filters added to the power line add noise of their own. The capacitors in the filter circuit leak current into the ground system. This noise is usually in the form of a reactive, nonlinear leading current. The same type of noise on the ground is caused by switching power supplies found in most computers and digital audio gear. This ground noise usually shows up as hum in audio gear. Class A tube amps and balanced mic pre amps are particularly susceptible to this ground noise.

All of the power-consuming devices in a studio are connected to unbalanced power (fig. 6). There are two wires supplying the 120 V power, with the ground for safety (and noise). If you measure between the two feed wires, the results will be 120 V. If you measure between ground and one of them, you will see 120 V. If you measure between ground and the other lead, you will see 0 V. Well, you are supposed to see 0, but because of ground noise and currents, you will measure a couple of volts. Just remember, with unbalanced power, all of the power-generated garbage ends up in the ground.

THE BALANCED POWER ANSWER

Balanced power consists of three wires (fig. 7). The same three wires that are connected to most studio equipment. If you measure the voltage between the two feed wires, you get 120 V. If you measure between either one of the feed wires and ground, you will see 60 V.

If we take any of the noise-generating equipment and connect it to the balanced power source, the noise generated in each leg of the power will be out of phase with each other at the ground. The ground will be quiet as a clam. Balanced power provides the same common-mode rejection we are all familiar with in balanced audio.

Quiet grounding schemes in studios sometimes border on the occult. I asked one studio why they had a water cooler in the control room with no water in it. The said that for some reason, when the water cooler was plugged into the same branch circuit as the guitar amps, that there was less hum in the amps. I unplugged it once. They were right.

Grounding circuits were never meant to carry current except during a short circuit. Objectionable ground currents are those that will provide you with a shock. Anything less than that is OK as far as Underwriters Laboratories is concerned.

We have all experienced ground loops in the studio. The really bad ones, with hum levels above the signal level, we try to cure. The ever-present little hums, that make the DAT meters stick one segment up from the bottom, we try to ignore. We try breaking grounds in balanced cables at one end so that we do not have multiple ground paths for ground loops. We lift chassis grounds with special plugs and make sure that metal chassis do not touch each other. If we removed the currents from the ground, then we would have no current to loop.

With balanced power, you can use any type of grounding configuration you wish. Star, schmar. You can leave the grounds connected at both ends of your audio cables. You can throw away all of the ground-lift adapters. You can finally plug everything in the way it was meant to be plugged in.

PROFESSIONAL QUALITY AT THE RIGHT PRICE

Heavy Duty ATA
- Custom and stock sizes
- Quick turn around

Medium to Heavy Duty Keyboard Cases
- Prices starting at $126

Heavy Duty AMP and Effect Racks
- Prices starting at $129

Prices starting at $59

Hardshell Cases
Available for:
guitars racks
keyboards

DISCOUNT DISTRIBUTORS

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

The Case Specialists

CIRCLE 21 ON FREE INFO CARD

Sound Deals

- Digital 8 Track Recorders
- Mixing Consoles
- Signal Processors
- Studio Monitors and Amplifiers
- Synthesizers and Samplers
- Drum Machines
- PA Systems
- Microphones
- Computer Software and Hardware
- Tape and Cabling

All major brands from A-Z

250 Old Towne Road
Birmingham, AL 35216
205-979-1811 Fax
72662.135 @ Compuserve.Com

for a sound deal call
800-822-6434

CIRCLE 59 ON FREE INFO CARD

Nightmare On Vintage Street

The trials and tribulations of ordering vintage gear through mail order

BY BENNET "GOTTA HAVE IT" SPIELVOGEL

The bad equipment score. It's probably happened to you more than once. Especially if you belong to that lowly and sorry lot addicted to purchasing mail-order, vintage studio equipment. Those wonderful toys that emanate sonic silk, grace, and warmth. Like that slick little pair of LA3A's — just a name, description, and a price staring at you from a comprehensive, dot matrixed, photocopied, stapled, and very-much-revered list of great stuff. You think, "They cut hits with that mystical, reality-packed, astronomically-priced vintage gear. The 3A's? Gotta have 'em."

So much for the dream. The reality, however, is often quite different. The seller assures you everything works and explains the terms are C.O.D. You bite, and even spring for the overnight shipping. The LA3A's arrive the next day. You make your audio connections, power up the units and...things are not right. Not only are there no lights on the VU meter, but the 3A's don't sound all that great. In fact, one of them seems to do absolutely nothing to the sound, and the other works intermittently. You've already paid your money, now what?

PAY NOW & PAY LATER

Before exploring a plan to minimize potential problems, let's take a quick look at the human side of the four stages of certified-check, C.O.D., vintage mail-order transactions.

1st Stage: Fascination. I got 'em, a pair of terrific old pieces.

2nd Stage: Fear. Hmmmm, no front-panel lights. Are these babies even on?

3rd Stage: Anger. A bad feeling about the equipment and the entire deal sets in. The dealer is no help. They've got no other units to exchange and, besides, all equipment is sold as is. You feel ripped off.

4th & Final Stage: Resolution. And here's where it gets interesting. There are a number of courses you may take.

- You opt for the easy route and figure the pieces only need a good cleaning with some of your high-priced spray (and when that doesn't work...)
- Get on the 'Net and make your feelings about the equipment dealer known. (You feel better, public service and all, but you're still out major cash.)
- Try and get your money back. (Good luck.)
- Legal measures. (Sue you, sue me, screw everyone.)
- Take the pieces in and get them repaired and eat the cost. This is what usually happens.

THERE MUST BE ANOTHER ANSWER

One solution involves putting resolution first, that is, before fascination. You need to take preliminary precautions *before* you do the deal. You'll also find many of these suggestions applicable when purchasing new equipment through the mail.

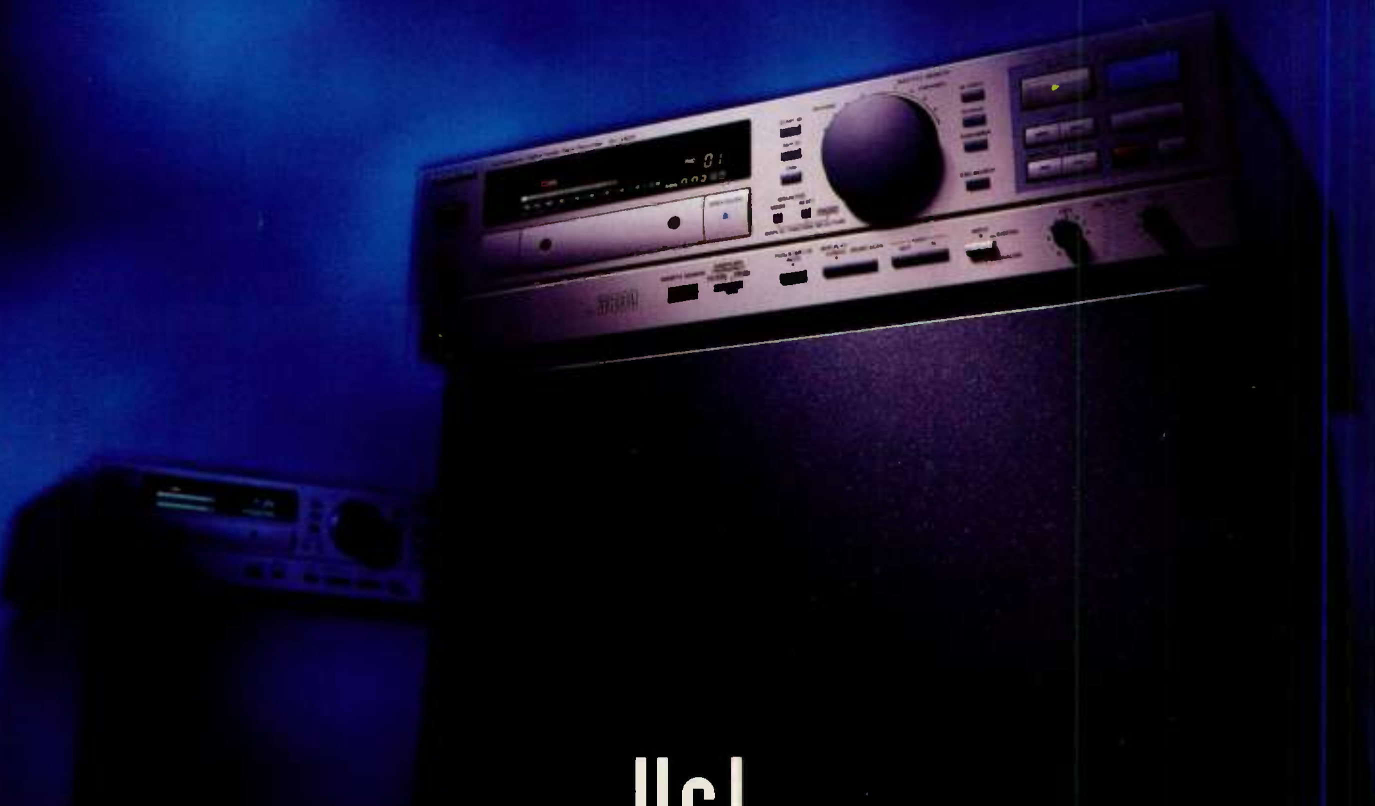
- Check your studio contacts for references on a particular mail-order company. And while you're at it, ask your studio friends if they've had any experience with the particular piece of equipment you plan to purchase ("It's a great piece, but the early ones run pretty hot and eat caps").
- Ask the mail-order company for a list of past customers and make some calls.
- Find out under what conditions the company will return your money if you're not satisfied. Is the equipment as is? Will they guarantee it to be free of defects for a specific period of time?
- Do they know if they equipment has been modified? (This can decrease value of certain vintage pieces — especially musical instruments — and it can make repairs a nightmare.) Attempt to obtain as much history about the piece as possible. Many pieces are sold because

Like New!
OOPS
THIS SIDE UP
1007
WELCOME

Illustration by Mike Browne

© 1996 Matsushita Electric Corporation of America

Someone finally built a deck that beats the SV-3700.



Us!

There's only one DAT machine that even comes close to the performance and value of the new Panasonic SV-3800 DAT recorder. We should know—we used to make it. The SV-3700 was the standard in the industry with over 60,000 units in use worldwide. Now, it's time to take a step forward with the new champion, the SV-3800—all the performance you loved in the 3700, and more.

The new 3800 gives you better sound, with D-to-A converters offering 20-bit playback resolution. The deck is more flexible and easier to use, with front panel assignment of all system settings, including digital I/O connections, SCMS status, and a new Single Play mode. Coaxial and optical digital I/Os are also added for maximum flexibility. With all these improvements, however, we did retain a key feature of the SV-3700—its price! The suggested retail price of the SV-3800 (including remote) is $1,695, so you get better sound and more features at the same price.

The SV-3800 is the new performance and value leader in DAT recorders. We should know, because our strongest competition is ourselves.

Official Broadcast Equipment Supplier of the 1996 Olympic Games

36 USC 380

Panasonic
Broadcast & Television Systems Company

For the dealer nearest you, call 1-800-777-1146.

WRH

modifications didn't quite work out as anticipated.

- Check with the Better Business Bureau (BBB), Department of Consumer Affairs, etc. The BBB can tell what complaints have been lodged.
- Ask if the equipment is in stock (i.e., are they in possession of it *now*). If not, will they be selling it to you sight unseen? This could mean the company is acting as a broker for equipment they have not personally inspected. This can be frustrating for you if you show up at the broker's business expecting to examine a heavy, big ticket item like a console or tape machine only to find the unit is actually sitting 1200 miles away.
- Determine if the equipment has documentation, service records, or even comes with spare parts, extender cards, special cables, or test tapes.
- Keep a written log of all phone transactions. The log should contain the date, time of the call, and the name of the person you spoke to. Summarize your conversation. The log will be helpful in resolving disputes. Plus, if you got good service, you're better off dealing with the same salesperson. If you ever have to go to court, these logs can be entered into the record.

The final item involves a little bit of effort on your part. But it could save your hide big time — especially on high-dollar purchases. You can draft a protection device through your local bank called a Letter of Credit. Most banks charge about 1.5 percent of the Letter of Credit's value for this service, plus any wire transfer fees.

A Letter of Credit is a simple contract you draw up with the seller. Both buyer and seller agree to payment terms before you get the equipment. You can get as detailed as you want (e.g., "There will be no dings in the windscreen and no deep scratches or gouges on the body of the U-67").

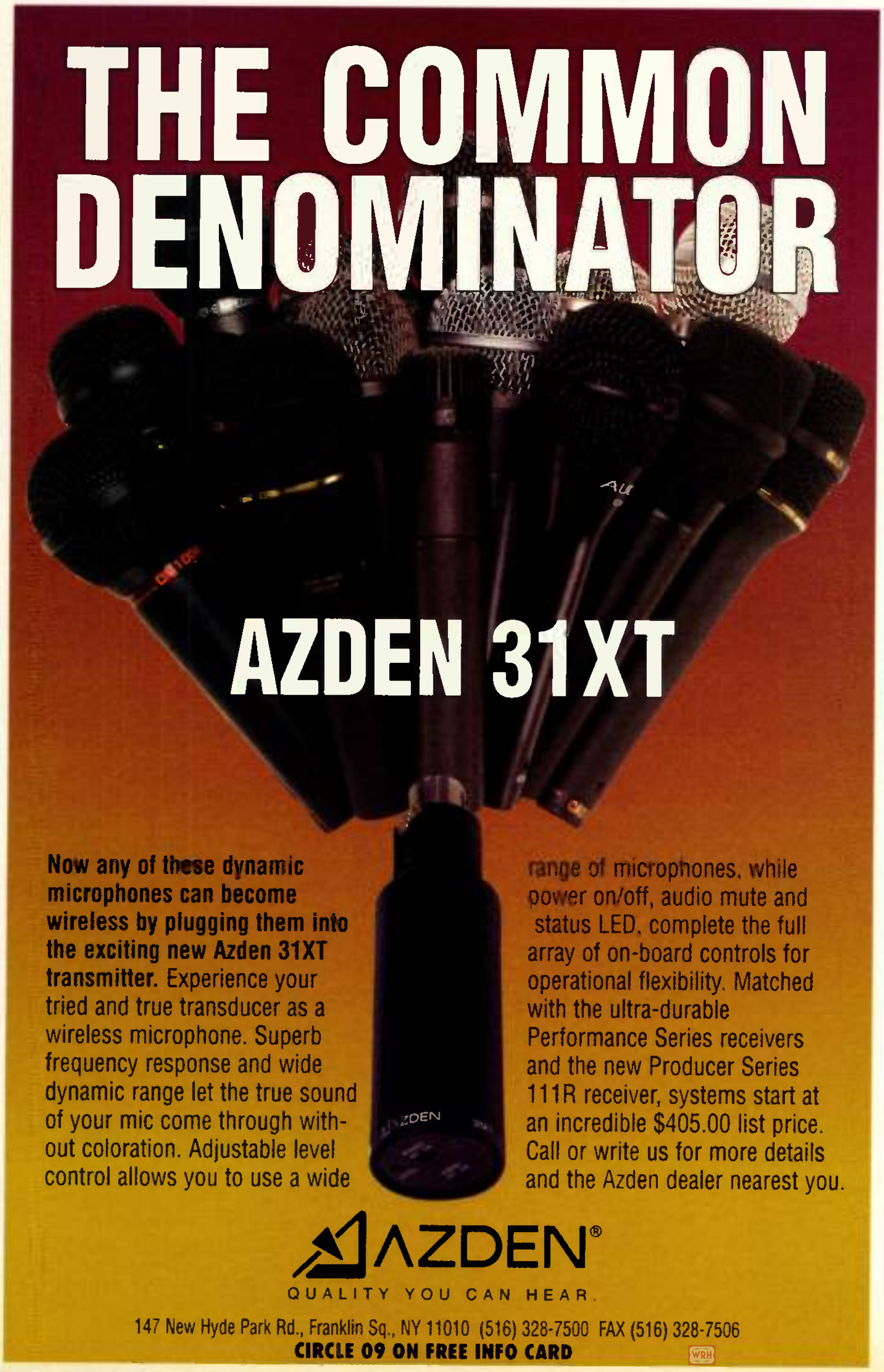
Here are some general conditions:

- Buyer pays freight/shipping C.O.D. when equipment arrives.
- Seller pays for return shipment if Letter of Credit conditions are not met.
- The buyer has four days (including weekends) to determine if the equipment works to specification or his/her satisfaction.
- Equipment must arrive with complete documentation (clear photocopies are acceptable).
- Equipment is not cosmetically disfigured.
- Final payment will be a certified check FedEx'd overnight by the bank to the seller.
- If the buyer rejects the equipment, the buyer ensures the equipment gets to the seller's location within six days of the reject/accept date or the buyer forfeits the money.

These are only examples; tailor your letter to fit your situation. A bank officer can help you create the formal draft and explain the logistics of letting the bank know if the equipment meets the conditions spelled out. You should fax the final Letter of Credit to the seller to make certain everyone agrees to all terms and signs off.

Once everyone is on the same page, the financial figure decreases significantly. You can think of the Letter of Credit as additional insurance. In the case of an $1800 purchase, the Letter of Credit costs you $27 (at a 1.5 percent face-value rate), plus a wire charge or overnight charge for the final payment.

Good luck and happy hunting. **EQ**



Now any of these dynamic microphones can become wireless by plugging them into the exciting new Azden 31XT transmitter. Experience your tried and true transducer as a wireless microphone. Superb frequency response and wide dynamic range let the true sound of your mic come through without coloration. Adjustable level control allows you to use a wide range of microphones, while power on/off, audio mute and status LED, complete the full array of on-board controls for operational flexibility. Matched with the ultra-durable Performance Series receivers and the new Producer Series 111R receiver, systems start at an incredible $405.00 list price. Call or write us for more details and the Azden dealer nearest you.

AZDEN®
QUALITY YOU CAN HEAR.

147 New Hyde Park Rd., Franklin Sq., NY 11010 (516) 328-7500 FAX (516) 328-7506
CIRCLE 09 ON FREE INFO CARD

MŌJO WORKING

Rane Corporation is shipping brand new technology at brand new prices. For over 15 years Rane has been producing the world's finest signal processing. Yet many of you have been asking for Rane quality that's even more affordable. We give you Mojo. The new Mojo SERIES is American made, inexpensive, and built to outperform "bargain" brands in every respect. Why wait?... Get your Mojo working now!

WORKING FOR YOU

MQ302 *Mojo Filters*

A fresh twist utilizing our Constant Q technology. The MQ302 is a stereo 1/3rd octave equalizer which features a single set of faders that controls both left and right channels! A ground breaking idea which fills a void in true stereo applications. **Get hip to the MQ302.**

MC 22 *Mojo Squeeze*

In a word......... innovative! Rane's own Acousticlear technology will help improve your system's overall performance. No compressor/ limiter can compete with the MC 22's superior design and sonic qualities. Destined to be the number one choice of our music industry. **The MC 22, at a Rane dealer near you.**

MX 22 *Mojo Divider*

You'll love this easy-to-operate, extremely accurate stereo 2-way, 24 dB per octave crossover. It incorporates an additional mono sub output. The MX 22 out-performs other brands that cost much more! **The MX 22 will work for you.**

MX 23 *Mojo Divider*

You'll find no other brand of stereo 3-way crossover that can outperform this gem. Like the MX 22, the MX 23 offers a mono sub output, and uses Rane's popular 24dB per octave technology to assure that your system remains in phase! **Cross over to the MX 23.**

MH 4 *Mojo Cans Amp*

You won't believe the performance you'll get from the MH 4, designed by the company that pioneered headphone amplifier technology. You will agree that this is the finest 4-channel cans amp out there. Play it loud! **Hear the MH 4 now.**

PURITY BY DESIGN
RANE
MADE IN USA

CIRCLE 52 ON FREE INFO CARD

RANE CORPORATION Phone: 206-355-6000 • Fax: 206-347-7757 • Home Page: http://www.rane.com

MORE THAN MUSIC... IT'S AN ATTITUDE!

Sampling Man

When it comes to getting samples for my keyboards, I prefer to do it myself

BY MARK DE GLI ANTONI

Soul Coughing is not your typical band. After all, how many bands do you know of where fluid acoustic bass lines meet funky drum beats and keyboard parts played in real time from custom-recorded samples? Mark De Gli Antoni is the sample wizard behind Soul Coughing and here he discusses how he went about formulating his keyboard sounds and parts for Soul Coughing's second CD for Slash/Warner, Irresistible Bliss.

Soul Coughing, when we go into the studio, inevitably record very quickly. The songs are pretty much completed and just about everything goes to tape live — there is very little overdubbing. The focus is to do all of it at once, including the vocals. So before we went in to record *Irresistible Bliss,* I had to get my keyboard sounds ready for the sessions. There wouldn't be a lot of time to get sounds while we were in the studio and I am very careful about presenting a finished sound. It's very rare that I'll go into the mixing session and say, "OK, now this sound needs this EQ or that effect." I think in complete sounds and I don't like to run into any surprises. It is hard for me to separate the musical composition and the sound I am using for that song. They go hand in hand.

Over my years of playing keyboards, I have never been one who is really into synths. I immediately went from piano to sampler, and when I got a sampler I thought, "Wow, what a fun instrument to play." I thought that it was OK if I didn't have the synths because I felt that a sampler is what synthesizers have always wanted to be anyway. So naturally I make a lot of my own samples — about 60 to 70 percent is making my own samples or taking familiar sounds and really trying to make a new sound. The other 30 percent has various references.

Sometimes when I sample from somebody else it's clear, like on the song "Disseminated" (from *Irresistible Bliss*). But often I really try to hide it — to make the sound a lot more personal or somehow transform it into something different. I do take

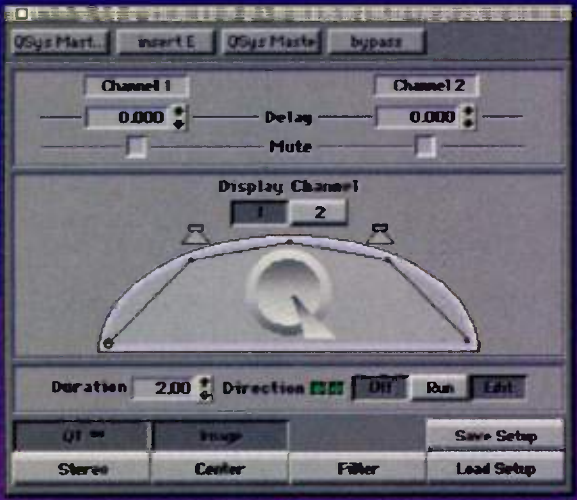
SOUL BROTHERS: Soul Coughing, from left to right, is Sebastian Steinberg, Yuval Gabay, M. Doughty, and author Mark De Gli Antoni.

WRH

EXPAND YOUR HORIZONS WITH QSOUND® 3D AUDIO

Tired of feeling as if you're trying to stuff your mix through a pair of keyholes? Solve your space problems with QSound® 3D Audio Plug-Ins for Digidesign® Pro Tools® III. Based on the same technology as the legendary QSystem™, these Plug-Ins give you room to breathe with patented 3D audio that really works! The highest fidelity spatial enhancement available, conveniently accessible from within the Pro Tools environment. Whether you choose QSYS/TDM, the mono-to-3D localizer, or QX/TDM, the stereo enhancer (or both!) you'll have a lush, large stage to build your mix on. Warning: seriously addictive!

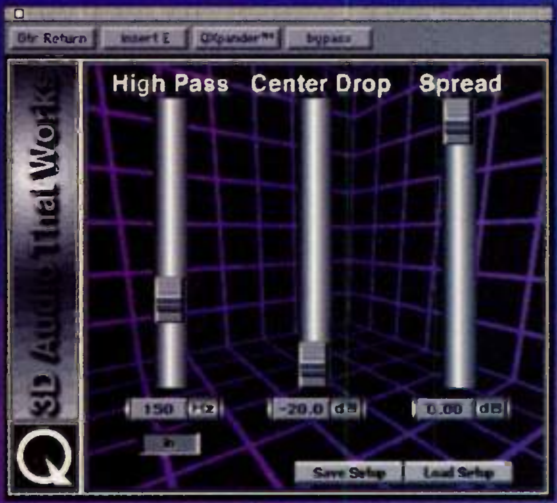
QSYS/TDM™


QSys Mast...
insert E
QSys Maste
bypass
Channel 1
0.000
Delay
Mute
Channel 2
0.000
Display Channel
1
2
Duration
2.00
Direction
Off
Run
Edit
QT
Image
Save Setup
Stereo
Center
Filter
Load Setup

Features: *Now! PCI Macintosh Compatible!*

- Four independent realtime parallel processing channels, each providing discrete sound placement outside of physical stereo speaker locations, all on only one DSP, for panning multiple mono signals or submixes.
- Real time mouse control of individual channel positions.
- Independent autopanners on each channel with user-definable shape, rate and direction.
- Up to 30ms delay per channel for special and enhanced QSound effects.

QX/TDM™


Otr Return
insert E
QXpander™
bypass
3D Audio That Works
High Pass
Center Drop
Spread
150
Hz
-20.0
dB
0.00
dB
in
Save Setup
Load Setup

Features: *Now! PCI Macintosh Compatible!*

- Convenient soundfield enhancement for any stereo signal – may be applied to main mix, stereo submixes or individual panned tracks.
- No input assignment or instance limitations.
- Each instance requires only 1/2 DSP.
- Center and Spread controls (0 to -20dB) for effects from the subtle to the dramatic.
- Unbelievably economical!

Also available – QX/SDII™ Professional Soundfield Expansion for Sound Designer II™

- Both Plug-Ins feature patented QSound® 3D Audio algorithms, specifically designed to produce high-bandwidth, high-fidelity spatial effects for loudspeaker listening which are also headphone-friendly. A single algorithm that can provide truly effective 3D Audio for both speakers and 'phones is a myth. (More info on our web site.)
- Adjustable (20 to 500Hz) high-pass process filtering provides natural low end and superb mono-compatibility, and setup save/load capability eases use.

PRO TOOLS

DEVELOPMENT PARTNERS digidesign

digidesign® AVID

A Division of Avid Technology, Inc.

3401A Hillview Ave., Palo Alto, CA USA 94304
Toll-free: 1.800.333.2137 Extension 254
Web: http://www.digidesign.com

CIRCLE 51 ON FREE INFO CARD

From the World Leader in Truly Effective, High Fidelity 3D Audio Technology

QSound Labs, Inc.
2748 37 Avenue N.E.
Calgary, Alberta, Canada
T1Y 5L3
Tel 403.291.2492
Fax 403.250.1521
Toll-free 1.800.315.8955
Web: http://www.qsound.ca

QSOUND

Sound Designer II is a trademark and Digidesign and Pro Tools are registered trademarks of Digidesign Inc. QSYS/TDM, QX/TDM, QX/SDII, QSystem and QXpander are trademarks and QSound and the QSound logo are registered trademarks of QSound Labs, Inc.

WRH

from popular sources and change the sound enough so that you cannot tell where it came from. But on songs like "Super Bon Bon," "Soft Serve," and "Soundtrack To Mary," (also from *Irresistible Bliss*) the sounds are all samples I made either from my music outside the band or in trying to imitate natural sounds.

My MIDI setup consists of a Roland A-30 MIDI controller, an Akai S1000HD stereo sampler, an Alesis QuadraVerb, a homemade fuzz box, a Total Peripherals SyQuest105 drive for storage, and a Sony Hi-8mm video camera. You might be wondering what the video camera is doing in my MIDI setup. I use the camera to record sounds before I put them into the S1000HD. It records audio in this weird, fake binaural/stereo (with a few missing frequencies) that personalizes the sound in a way I really like. Once I have recorded the sound onto videotape, I run it straight into the sampler. The sampling process is usually concise on the S1000HD because the unit doesn't have many EQ options. But I do use the stretch, loop and combination/mix options.

The QuadraVerb is an after-the-fact machine used almost like an effects pedal for live situations. If I'm in an improvising mode, searching for sounds, and I come across something I don't think I'll remember how to reproduce, I will record it onto my DAT machine so that later I can review how it was done. I treat the sounds more like a synthesizer treats sounds. Most often my approach is as if the sampler were a synthesizer: here's a keyboard with a weird sound across it (as opposed to different samples on each key), what happens if I play it like a piano?

On some songs I do literally have a different sound on every single key but that's more the nature of the song, where it's about lots of different information coming at you. On this record, I wanted to deal with more keyboardy sounds. So when I switch sounds, it's more like switching the whole keyboard.

Whereas I used to try to find a good long sample, I have become increasingly concerned with the small sonic aspect in a given sound. Take as an example track 5, "Lazybones." For the first half of the song I developed an organ-type sound from various cymbal decays that were stacked together and then looped. But on "Soft Serve" (track 2), the organ sounds are made from piano note decays with an overdrive on the attack to give the illusion of an organ. And on "Disseminated" I had a recording of some street construction that I intentionally overcompressed so that you can hear the compressor attacking and then releasing. I used this as a percussion accent in the third section. But on "How Many Cans" (track 12) I used the sampler in a more conventional way for recording random sounds from a bird sanctuary.

> On some songs I do literally have a different sound on every single key but that's more the nature of the song, where it's about lots of different information coming at you.

On this record there is only one actual loop (on "Disseminated"), and it's by Raymond Scott. The song "4 Out Of 5" has the illusion of a loop, but it's really a part that I am playing. None of these parts are sequenced because there's no way to sequence in our band. It's all about retriggering and playing other parts or separating a loop into many parts. Rarely do I trigger a sound and just let it play out. I might divide the whole loop into two or three parts so that I'll be playing the first part of the loop on one key and then the second or third on different keys. The rhythm section will always change and there's no way to just put something down by sequence and expect Sebastian (Steinberg, bass) and Yuval (Gabay, drummer) to lock to it. That doesn't work for us. By manually triggering, it may sound like a loop but I am actually playing the parts. I do that a lot and I also use the joystick, so if Yuval and Sebastian speed up, or slow down, I'll be right with them. Although moving the joystick can change the tuning a bit once you set the song in motion, it's not very noticeable.

PUTTING IT ON TAPE

When we recorded most of the songs on *Irresistible Bliss*, I ran the stereo output of the sampler through the QuadraVerb and then the stereo output of the QuadraVerb through two guitar amplifiers, a Music Man Twin and a Fender Bassman '59 reissue. The amps were miked with either two Shure SM57's or an SM57 and an AKG C414.

The tracks were recorded at the Power Station and Sear Sound. At the Power Station, we had Yuval's drums in the main room and (lead vocalist) Doughty in an iso booth with his guitar (but his amp was down the hall), while Sebastian and I were together in another room. My amps were all covered up and Sebastian's amps were in yet another room so there's no bleed between Sebastian and I (this was much different from the first record where Sebastian, Doughty, and I recorded everything in one room, including the vocals).

At Sear Sound they had this enormous Leslie setup with two cabinets stacked one on top of the other and a great overdrive — it looked to be about seven feet tall. So, on certain songs, I ran my sampler through the Leslie rig and it made for a significant difference in sound. The Leslies added a nice dirty tone to my pseudo-organ sounds, as well as the samples.

After exposure to other samplists, it seems that the "weird" technique of mine is to treat all sounds as keyboard sounds, whereas most people play the piano or organ sound as a keyboard sound and then simply trigger the rest. I try to turn every sound into some new hybrid, which means that I'm often playing in three different keys within a given song — none of which are in the song's "key." And I never attempt to make sure all my sounds are in concert pitch. The fun of a sampler is to have some new, unknown sound in a totally different key than the previous sound and just start using it. EQ

Angela II

- Dual path architecture provides 80 inputs in the standard 40-channel chassis
- Extremely easy to use and especially suitable for project and production environments
- Comprehensive 4-band AMEK Eq on every input
- Fader and Mute automation on every input
- 8 Auxiliary and 24 output buses with Master level controls on all buses

AMEK
Angela II

- Proven AMEK SUPERTRUE automation with extensive on- and off-line mix operations
- 40 channels of AMEK VIRTUAL DYNAMICS provides a range of computer-controlled Compressors, Gates and other devices
- AMEK Visual FX provides remote operation via MIDI from the console of effects devices by major manufacturers such as LEXICON, TC and YAMAHA*
- Solo-In-Place and fully automated Solo-In-Place systems with automation-controlled Solo Defeat
- Integral onboard jackfield
- Magnificent design and first class ergonomics

AMEK

Head Office, Factory & Sales:
AMEK Systems & Controls Ltd
Tel: 0161 834 6747/
0161 950 8767
Fax: 0161 834 0593
E-Mail:amek@console-city.com

In the USA:
AMEK US Operations, Inc.
Tel: 818 508 9788
Fax: 818 508 8619

In Germany:
Mega Audio GmbH
Tel: 06721 2636
Fax: 06721 13537

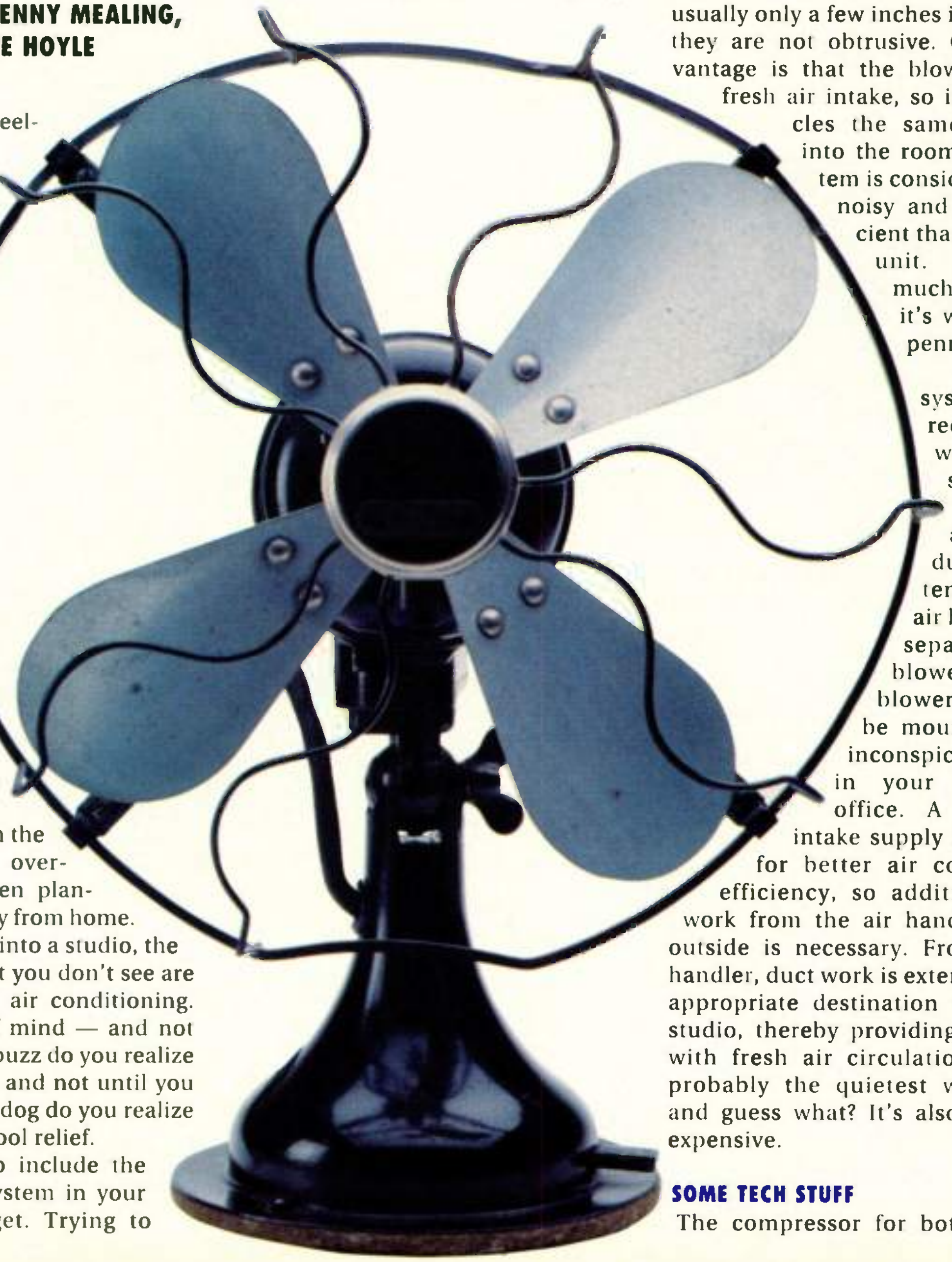
In Singapore:
AMEK Systems & Controls Asia
Tel: 65 251 1629
Fax: 65 251 1297

CIRCLE 05 ON FREE INFO CARD

Maintaining Your Cool

Protect yourself, your clients, and your gear by keeping the heat down — quietly, of course

BY TAY HOYLE, PENNY MEALING, AND CHARLIE HOYLE



Ole! Ole! Ole! Ole! Feeling hot, hot, hot?

Anyone who has spent more than five minutes in a studio knows that heat is the enemy. It can destroy electronic components and artistic creativity. No matter how big or how small, recording studios, packed with gear that's cranking away, get hot. Yet, maintaining a cool, safe, and pleasant working environment is often the most commonly overlooked expense when planning your home away from home.

When you walk into a studio, the two main things that you don't see are the wiring and the air conditioning. Out of sight, out of mind — and not until things start to buzz do you realize the need for wiring, and not until you start sweating like a dog do you realize the need for some cool relief.

It's essential to include the cost of a cooling system in your initial studio budget. Trying to operate under heat stress is a losing proposition for equipment and studio personnel. There are three basic air conditioning options:

1. Window unit
2. Split system-ductless
3. Split system with air handler that will require duct work.

PROS AND CONS

The window unit will suck. They are noisy, leave big holes for outside sound leakage, and your options of where to put them are limited. But it is the cheapest way to go.

The ductless split system consists of a compressor and an air blower. The compressor can be mounted anyplace outside, in any window in your home or office or on the roof. The air blower is mounted on the wall or ceiling of the studio. Two copper pipes connect the compressor to the air blower. The air blowers are usually only a few inches in depth, so they are not obtrusive. One disadvantage is that the blower has no fresh air intake, so it just recycles the same air back into the room. This system is considerably less noisy and more efficient than a window unit. It costs much more, but it's worth every penny.

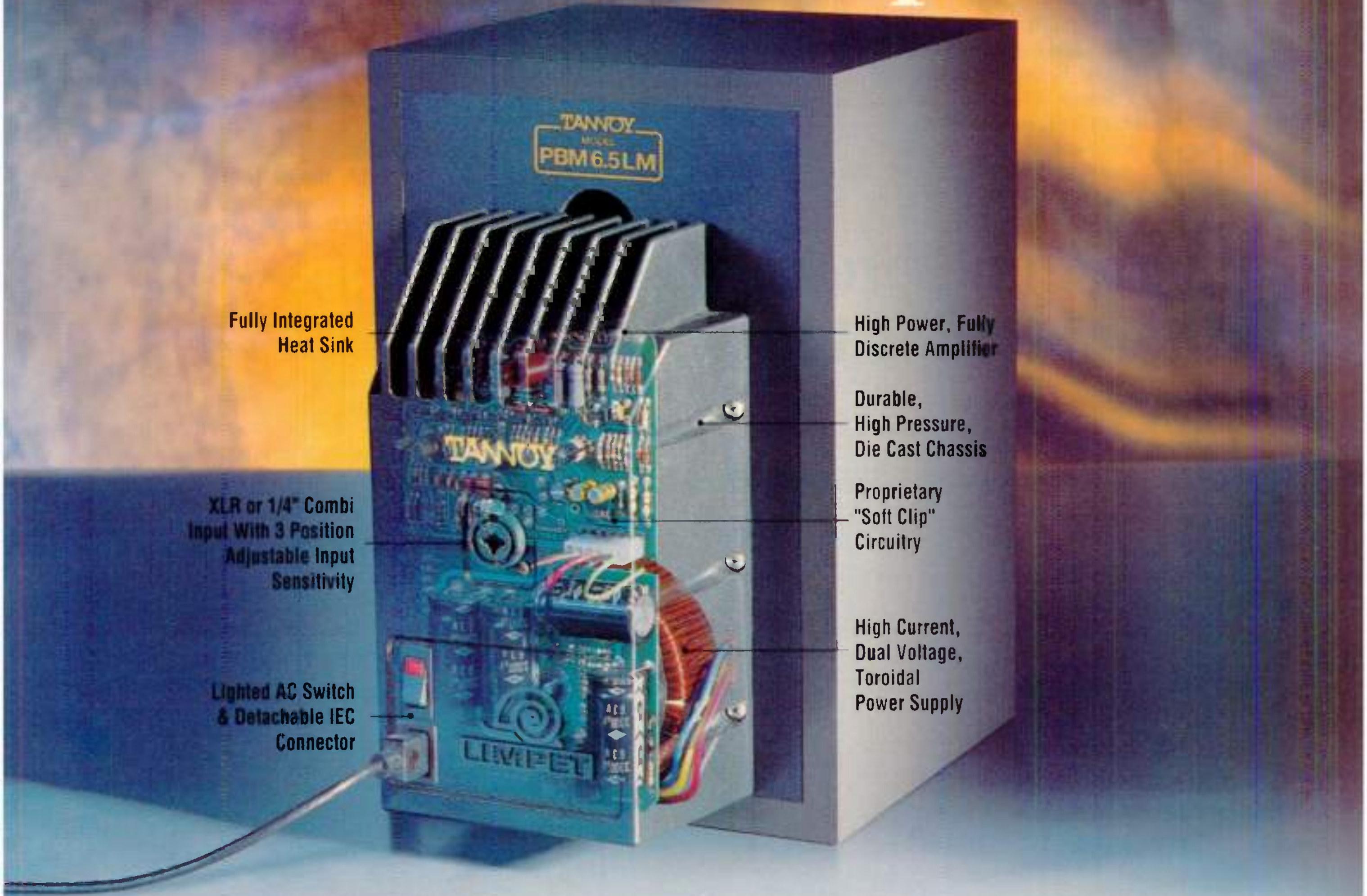
The split system that requires duct work has the same compressor as the ductless system, but the air handler is a separate large blower. That blower needs to be mounted in an inconspicuous place in your home or office. A fresh air intake supply is required for better air control and efficiency, so additional duct work from the air handler to the outside is necessary. From the air handler, duct work is extended to the appropriate destination within the studio, thereby providing the room with fresh air circulation. This is probably the quietest way to go, and guess what? It's also the most expensive.

SOME TECH STUFF

The compressor for both systems

WRH

They Call Him "Mr." Limpet®


TANNOY
MODEL
PBM 6.5LM
Fully Integrated Heat Sink
XLR or 1/4" Combi Input With 3 Position Adjustable Input Sensitivity
Lighted AC Switch & Detachable IEC Connector
High Power, Fully Discrete Amplifier
Durable, High Pressure, Die Cast Chassis
Proprietary "Soft Clip" Circuitry
High Current, Dual Voltage, Toroidal Power Supply
TANNOY
LIMPET

■ Every once in a while a product comes along which not only meets the ever increasing demands of the market, but one whose smooth commercial styling, ergonomics, durability and outstanding performance demands respect. Introducing MR. LIMPET. ■ The LIMPET is a unique, compact design that combines a very high current toroidal power supply, fully discrete amplification stages, and ultra wide (10 Hz to 80 kHz) bandwidth capabilities in a very affordable system. ■ Built using a one piece high pressure die-cast metal housing, the LIMPET is not only very rugged electrically and mechanically, its internal construction takes advantage of the industry's most advanced assembly techniques. ■ The LIMPET amplification system can be used with a wide range of TANNOY professional reference monitor systems, and provides the user with a number of improvements in both the performance of the loudspeaker system, and its flexibility. ■ Each single channel LIMPET system delivers an enhanced stereo image because the channels are fully separated - no power supply sagging due to inter-channel coupling, no crosstalk, no interference. Almost any kind of input level and connector can be used, since the LIMPET offers a balanced or unbalanced "combi" connector that can utilize either 1/4" or 3 pin jacks. ■ The ultra-low noise input section can accommodate either 0.775, 1.0, or 1.5 volt drive levels with no performance sacrifice. ■ The LIMPET's universal power supply, equipped with an industry standard IEC connector easily deals with almost any voltage, making the LIMPET a true global traveler. Finally, you can take your monitors wherever your work takes you, and not have to worry about cumbersome and troublesome adaptors, power converters, or strange electrical systems. ■ In addition, the unique and proprietary soft-clip circuitry and the significant reserves in the power supply ensure that no damage will occur to the drive units while providing the headroom needed for even the most demanding requirements. ■ The LIMPET is ideal for professional recording, broadcast/post production facilities, remote and live recording reinforcement applications, and finally gives the private/home recording studio truly reference quality performance unequaled at twice the price. ■ Instead of settling for the ordinary, get a LIMPET and get a real grip on your reference monitor performance.

TANNOY

HEAR BELIEVE

TANNOY/TGI NORTH AMERICA INC. • 300 GAGE AVE., UNIT 1, • KITCHENER, ONTARIO, CANADA • N2M 2C8 • (519) 745-1158 • FAX (519) 745-2364

CIRCLE 88 ON FREE INFO CARD

WRH

If You Need More Power Than This...

ASHLY
MFA-8000
AC Power
Off
On

Maybe You Should Run For President

Our new MFA Series of amplifiers deliver the power that digital audio sources demand. Whether used for motion picture sound tracks or live contemporary music, these models faithfully reproduce the extended dynamic range of today's technology. High power, great sound, and a full Five Year Worry Free Warranty. Why buy anything else?

* 24,000 watts as illustrated: Eight MFA-8000 amplifiers combined, each putting out 1500 watts per channel into a 2 ohm load. Also available: the MFA-6000, with up to 900 watts per channel.

POWER AMPLIFIERS BY ASHLY

Ashly Audio Inc., 847 Holt Road, Webster, NY 14580-9103 • Toll Free: 800-828-6308 • TEL: 716-872-0010 • FAX: 716-872-0739 • Canada: Gerraudio Dist. Inc. 416-696-2779
International Agent: E and E Exports Inc. 714-440-0760 • Internet: http://www.ashly.com

CIRCLE 15 ON FREE INFO CARD

EQ LIVE

SUPER SPECIAL

THIRD SUMMER OF LIVE

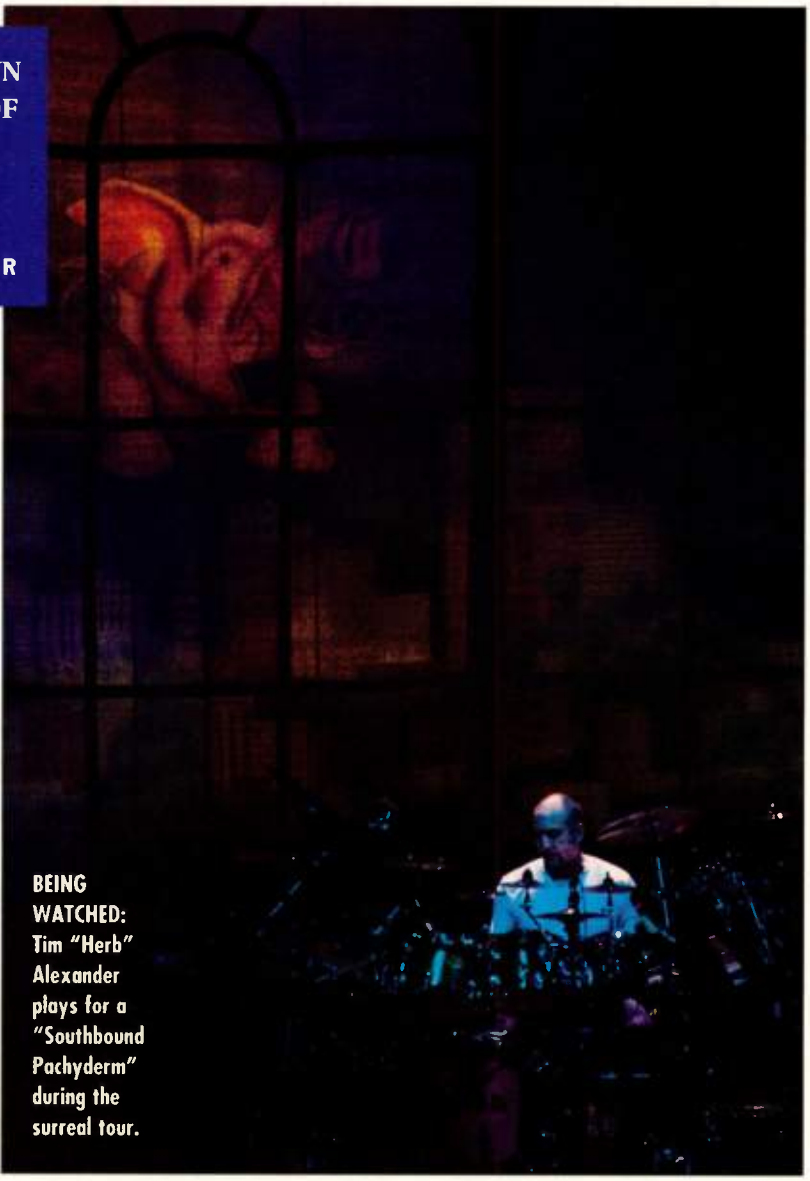
Here we go again: the heat, the crowds, the overnight rides to gigs 500 miles apart. Yes, it's summer, as once again EQ pays its annual homage to the live sound warriors of this busy season with spotlights on new gear, hot tours, and cool tips from seasoned pros.

WRH

TALES FROM THE FOH

PRIMUS SCALES DOWN FOR THE FINAL LEG OF THEIR *TALES FROM THE PUNCHBOWL* TOUR

BY ROBERT GRANGER



BEING WATCHED: Tim "Herb" Alexander plays for a "Southbound Pachyderm" during the surreal tour.

Photos by Steve Jennings

WHEN A BAND is in touch with their creative and technical sides as closely as Primus is, they rarely like to leave their live sound in the hands of just anybody, which is why when it's time to hit the road, they do so with Derek Featherstone. As Primus's FOH man for the past six years, Featherstone helped the band record their "breakthrough" album, *Pork Soda*, and was a technical advisor on their latest album, *Tales From the Punchbowl*. He has also been an integral part of the band's production team for the past five years and holds a position as a tour coordinator and consultant at the California-based touring company, Ultra Sound.

ON THEIR LAST LEG...

For this, the final leg of the Primus current tour, the band, their management, and Featherstone have decided to abandon the "big rock show" mentality for more of an intimate, laid back, stripped-down approach. "The previous leg of this tour went very well, but it was just a lot of work. We had a fairly sizable set with us, which limited the venues we could play, so our approach to this leg of the tour was just to cut it all down using a smaller set with a few less PA cabinets and a small lighting rig. This enabled us to get it all on one truck and one crew bus and go out and have some fun. In fact, with a couple of the shows, just to make our own lives easier, we've tied in to house PAs — so far once into a house PA and twice into the house lighting rig. We're really just trying to be logical about the whole situation. Instead of being stubborn and trying to unload an entire truck into a small building, we take in just enough of everything to make it work for us to play in a medium-sized club atmosphere."

The Ultra Sound PA that the band is carrying is a Meyer system that's quite similar to the system that they used at the onset of the tour, scaled down to match their needs. "We've got 2 rows (4 wide) of Meyer MSL3's per side, and under that we've got four MSL2's, which we use primarily as vocal fills. Les Claypool is sort of a soft-spoken singer, so I like to put a little extra vocals in there, though I'll occasionally sneak some other program material in. To cover our low-end, we're using eight Meyer 650 double 18-inch sub boxes. Everything's powered by Ultra Sound-modified Crest 7001 amplifiers."

In order to convey Primus's low-end range to the die-hard fans on the floor, Featherstone has integrated a "pit-fill" into the system. "The front pit-fill is really pretty cool. We have a pair of Meyer MSL2's stacked on top of a pair of Meyer MSW's — it's a new box that's got a single 18-inch woofer and the same footprint as an MSL2 — so we've got some low end for the little kids in the front to get their faces blown away while moshing about."

Featherstone has the system divided into four channels of audio. The system is split into a left and right side and each group of subs runs off its own particular side, so there's no separate sub sound. The MSL2's used for the vocal fills run mono, and the "pit fill" is also run mono. He states, "When we have an ideal scenario where everything is in the same plane, I don't have to do any time changes through the system. If I have to, I'll go into our TC Electronic 1280 delay and time 'em up. I'll usually end up timing the system with the delay when the PA's out a little further, or the subs down a little further. The other thing I'll try before using the delay is running the subs out of phase if they're not too far from the PA."

THE HELMSMAN'S REALM

Featherstone's console for this tour is the same Crest Gamble EX56, 56-input console that he and the band recorded *Pork Soda* on. The main effects rack houses a TC Electronic M5000 and an Eventide 3500 for vocal duties, an Eventide H3000 for the drums, a Yamaha SPX 90 for the snare drum, and a Lexicon PCM70 for the rack toms. "The TC Electronics M5000 has become one of my favorites," injects Featherstone. "It's really a cool unit. Ultra Sound has about six of these now. This one has only got the single [DSP] engine in it, but when you have the double engines you can basically get four ins and four outs, where this is only two ins and two outs. But I'm very, very happy with it. It's got some very cool reverb sounds in it and in the long run, I'll probably just keep the Eventide 3500 and the two M5000's and just give everything else away." Everything in the main effects rack is MIDI controlled via a ground control unit that Featherstone has programmed in individual program patches for each song. Compression on vocals, the bass channels, guitarist Larry LaLonde's six-string banjo DI, and the kick drum is taken care of via a small collection of Aphex Expressors.

Featherstone also opted to bring out a Meyer SIM analyzer with a multichannel switcher to help obtain the best EQ curves possible. "Because we have the multichannel switcher, we set up two mics — one out on the floor facing the stage and one at the mix position. What I can do with the analyzer is listen to either side of the PA; EQ it with the mic up close and store that curve; then compare it to the EQ from the mix position so I can estimate the changes that should be made. Of course, when we open the doors I've got to pull the floor mic in because the kids would destroy it. At night I'm only using the mic at the mix position. When the kids come in, I'll re-analyze the curves from the mix position and compare them to the curves we stored earlier in the day. From there I can make any slight changes. Even with the room full of people and the band playing at full volume, I can switch over to the analyzer and look at any of the assigned branches, let's say the "pit-fill," and the machine will actually ignore the rest of the PA and just read those four speakers. It's a very sensitive device and I'm definitely very happy with this technology."

THE STAGE IS SET: Primus plays to fans during the first leg of their tour.

LES IS MORE

One of the main things that sets Primus apart from other bands is Claypool's use of his bass as more of a melody instrument than a traditional rhythm instrument. His intricate style that includes elements of strumming, slapping, and tapping puts both his arsenal of fretted and fretless basses, as well as the PA system, to the test with each and every show. "Generally speaking, Les is really good at handling his switching between his basses and his effects. When they recorded their last record he did all the tracking himself, so he sat in the studio with the bass and his effects programs with headphones, and he would adjust the output level of every program he used with each bass. So basically what he sends out to FOH is pretty stable.

"The output levels between all his basses are very similar so I have a little bit of compression on them just to even everything out. What I do is run three channels on the bass — one channel is his main channel, which is either his ADA MP-1 or MP-2 (which ever one he's using), and what comes directly out of that unit is his main sound. Next, I have a Countryman bass direct feeding off of the direct out of his Samson wireless, this channel has no effects — nothing at all. On the direct channel, everything above about 150 cycles is taken out so all it is is low end. That basically ends up being Les's sub track. The bass direct being out of phase with the ADA kind of gives it some good fat bottom end, and then I have an Electro-Voice RE-20 that's primarily just a back-up these days in case the other two go out. I usually output about 30 percent of the bass mic in the mix during the show. Between those three signals, that's where his sound comes from."

For vocals, Featherstone is using a pair of Shure SM57's to help filter out some of the stage volume. "We were using Shure SM58's for the longest time, but there's a fair amount of stage volume up there, so we switched to 57's per Les's request to tighten up the pattern a bit."

ELECTRIC LARRYLAND

Guitarist Larry LaLonde's setup is quite similar to Claypool's, utilizing a mic/DI combination. "With Larry, I just have two Shure SM57's in front of his Marshall 4x12 that go hard left and right. I also use a Demeter tube direct along with the SM57's. What we'll do is take the Demeter into a channel, take the direct out of that channel and put it into the channel next to it, then I put the two out of phase with each other, panned hard left and hard right, to give it a false stereo sound. I run that about 50

WRH

MELODY MAKER: Bassist/vocalist Les Claypool uses his instrument more for melody than for rhythm.

percent below the mic channels. The mics are his primary sound, but the Demeter gives it a little bit more of a bite."

Tim "Herb" Alexander's exotic drum kit is actually miked up pretty simply. Featherstone uses a pair of Shure SM57's on the snare drums, one up and one down; Electro-Voice 408's for the rack toms and the floor tom; an Electro-Voice RE-20 for the gong bass; Ramsa S-5 clip-ons for the octobans; AKG 460B's for the hihats' and three AKG 414's as overheads. It's actually the kick-drum that Featherstone does the most processing and work with.

"I'm using an Electro-Voice RE-20 on the kick drum which I'm pretty happy with. On the front side of the kick drum (on the batter-head), there's a little May/SM57 that I use to open the sidechain of a noise gate that turns on the RE-20. It's a foot in front of the mic, about a millisecond before it, so it turns the mic on all the time, theoretically. The sidechain opens up into the noise gate and then the noise gate feeds into a 1/3-octave EQ and the EQ feeds into a compressor. So I have a fair amount of processing on the kick drum, so we can get through any scenario. I started doing that a long time ago before we were carrying around a PA because we were dealing with a lot of bad PAs in different buildings and I needed to be able to make the kick drum really solid. They don't use any of that processing on the stage mix and, as a matter of fact, for the recording we're just using the RE-20 straight to tape."

BEHIND EVERY GOOD TOUR...

Because he usually spends most of his day's in the mobile Primus production office, Featherstone is very dependent on his crew to help get the system up and running. "We've got a great bunch of guys with us out here on this tour. Chris Charucki has been taking care of the support acts and helping a lot with this taping scenario in addition to getting the FOH up and running. Darryl Busino is out here as an Ultra Sound tech, and Matt Haasch mixes monitors for Primus in addition to being their stage manager. For the support acts, Darryl is at FOH and Charucki moves to monitors — we're all kind of floating around. Everybody on the crew can do most everything, which is great. I spend more of my time in production, which is kind of unfortunate because I'd like to spend more of my time messing around with the FOH gear. Every day I'll spend three or four hours on the phone advancing shows and then, eventually, I'll come up and have my time to play." EQ

PRIME CUTS

BY DEREK FEATHERSTONE

We are recording all of Primus's live shows. I don't really know what the outcome will be — maybe we'll make a live record, assuming, of course, that we don't screw it all up. We recorded the last leg and we listened to some of the tapes, and they seem musical enough.

We're using three modified ADATs. We put new D/A converters on the outputs. We replaced the D/A converters at Ultra Sound and upgraded the machines software to the most current version. Other than that, ADATs are ADATs — every once in a while you have a little problem with them, but we've been pretty lucky.

Our Crest Gamble EX56 console is really routed oddly to accommodate for the recording. With this Gamble , there's so many ways that you can patch into it. What I do is take some of the console's direct outputs — which means it's going to be post-EQ, post-insert, prefader — and send them to tape. On the channels that the house sound differs greatly from the desired tape sound, we use a number of mults. The signal goes from the patchpoint out to a mult — one side of the mult goes directly to the tape and the other side of the mult goes to the compressor or gate, and then back to the board. This allows me to EQ the channels, like the kick drum and the gong bass, in the house while the signal going to the tape is untouched.

Once all the patching is done, we just need to watch the gain pot and avoid peaking out the ADATs. The multed channels going to tape are more likely to peak out due to the fact that we patched around the compressors. When the guys in the band eventually mix down these tapes, they can choose the processing they want to use and not have it restrict what we do while mixing live.

Brand new disk-based recording technology from E-mu Systems

DARWIN

Is the Natural Selection

- Seamless integration into an Alesis ADAT/BRC system, providing random access editing and processing of ADAT tracks, all in the digital domain.
- Digital audio workstation power without a complicated computer interface.
- Price and ease of use comparable to a modular multi-track tape machine.
- Records onto inexpensive 1GB Iomega Jaz cartridges eliminating the need to back up and restore between projects.

E-MU
DARWIN
DIGITAL AUDIO DISK RECORDER
VOLUME
EXIT
AUTO INPUT
REHEARSAL
SELECTION
CLIPBOARD
MIDI
SCSI
RTZ
F. FWD
STOP
PLAY
DEC
INC
ENTER

DARWIN

Ready to record right out of the box, no cards, no computer, no headaches! (no kidding)

Call for a dealer nearest you at 408.439.0368

E-MU

E-mu Systems

For more information, contact: P.O. Box 660015, Scotts Valley, CA 95067-0015
UK Office: Suite 6 • Adam Ferguson House • Eskmills Industrial Park • Musselburgh • EH21 7PQ • 44.131.653.6556
Visit our web site at: http:// www.emu.com

CIRCLE 30 ON FREE INFO CARD

WRH

THE NEVILLE BROTHERS LIVE AT MARDI GRAS

TRICKY LOGISTICS MAKE TEAMWORK A MUST DURING THE NEVILLE BROS. ANNUAL BALCONY BLOW-OUT

BY DAVID NORMAN

FOR THE PAST few years, The Neville Brothers have been playing Mardi Gras in Galveston, TX. When I joined the group, this was the show that everyone was talking about. Because of the unusual setup, I couldn't wait to see it. The bizarreness of this gig was that the band would be performing on the second-story balcony of a building overlooking the Mardi Gras parade route so the band would literally be looking down at their audience. Directly opposite the balcony would be another building that posed problems with slapback. But this wasn't *the* strangest thing. No, that honor went to the fact that monitor engineer Kenny Nestor and I would be set up (side-by-side) *behind* the band. We would be separated from them by a wall with a few windows, allowing limited visibility of the band at best.

PRESHOW PLANS

I flew into Houston from Atlanta the night before the show, Kelsey Smith (our drum tech) flew in from San Francisco and the rest of the crew would be driving in with our truck. The band would fly in the following afternoon. One of the Mardi Gras runners picked us up at 6:30 AM for the drive to Galveston and an 8:00 AM load-in. Our truck with stage manager Eric Kolb and driver Matt Howell would be arriving around 9:30 AM from a gig with the Meters (Art Neville's group).

PA for the show was provided by LDS Systems (Houston), and they loaded in earlier that morning. By the time we arrived, LDS had most of the PA up and running. Carl Dunlap, systems engineer for LDS, got the day off to a good start with his great hospitality and his ever-present candy box full of goodies. Carl walked Kenny Nestor and myself through the unusual setup and introduced us to monitor systems engineer, Catfish.

TRICKY RIG: Catfish at the balcony monitor rack.

The "stage" itself was very narrow and had limited access, which was a major concern because the Nevilles have nine people with a fairly elaborate setup. Plus, we had a six-piece opening act that had to set up around our gear. We always try to make the opening act as comfortable as possible, but today would be really stretching it because of the stage situation and limited "dead case" space.

Kenny and myself were approximately 20 feet away from the band, and the wall and windows didn't afford us much isolation from the band's stage volume. Since we really didn't have great visibility, we depended on drum tech Kelsey Smith to be our eyes and ears for the band. Not only did Kenny and I have to contend with the band being in front of us only a few feet away, but we were also in the catering area where there was quite a bit of noise and a lot of people walking around. At first, the noise was distracting to me. For my monitoring purposes, I had a pair of Turbosound TMS-3's mounted on empty road cases. The cabinets were positioned only about 10 feet away from me — just imagine how big these cabinets are pointing straight at you!

The Neville Bros. carry their own Shure microphones (for drums, guitars, vocals and percussion), mic cables, and drum, percussion, and keyboard looms [bundle of cables, like a snake], so we set up most of our gear and ran all of our

THEY ARE FAMILY: The Neville Brothers on tour.

Photo by Sean Smith/LGI

YOU DON'T NEED BBE

__Until__ you hear it!

Then your point of reference is forever changed.

362
SONIC MAXIMIZER
BBE PROCESS
462
SONIC MAXIMIZER
BBE PROCESS
862
SONIC MAXIMIZER
BBE PROCESS
LO CONTOUR

"There is an added fullness and clarity. Stereo program becomes more three dimensional, more spacious. Dense textures become more pleasurable, with a more palpable space around each discrete instrument. This is powerful stuff. Maybe its voodoo?"
Recording Magazine

"As close as we've seen to a magic black box, the BBE 462 is probably the most cost-effective improvement you can add to your rig."
Guitar Player Magazine

"Listening on a variety of loudspeakers – JBL, KRK, Meyer, Tannoy, Yamaha and a few lesser-known names – I discovered that the BBE Process provided a nice punch to older recordings without being brittle or shrill. The LF contour emphasized the bottom end, without undue boominess."
MIX Magazine

"All of the mixes we played gained extra sparkle and clarity when processed with the BBE 462."
Keyboard Magazine

GO HEAR WHAT YOUR EARS HAVE BEEN MISSING.

A 30 second demo is all you need. Call your dealer now!

BBE®

5381 Production Drive • Huntington Beach, CA 92649 • ☎ (714) 897-6766 • Fax (714) 896-0736

CIRCLE 91 ON FREE INFO CARD

CLOSE CALL: The balcony FOH (forefront) and monitor setups.

lines. We didn't opt to line check at this point because of time constraints, but we did wire the complete stage with mics and direct boxes. When the opening act was finished, all we had to do was pop our looms in — we were completely wired in less than 10 minutes. Line check for us began immediately after the opener was off the stage.

Since the Neville Bros. rarely soundcheck, we had minimal problems with line check, and once I finished EQ'ing the drums and line-checking everything else, I handed the stage over to Kenny so that he could ring out the monitors and check Aaron's Future Sonics In Ear Monitors®. Aaron uses the In Ear Monitors in addition to a pair of wedges placed on his right. He also has a Mackie mixer that he can use to personally control his own volume and reverb levels. We had at least an hour between the opening act and our set to do a set change because of the Mardi Gras parade during this lull.

During line checks and drum checks I had to crank the volume pretty loud, so Kenny suggested moving the monitors closer to me and angled in away from him to make his life a little easier. With Kenny right next to me and having only one cue wedge, this worked to both of our advantage. One funny note about Kenny's cue wedge: we had many people walking back and forth behind us and once during the show, someone was walking behind Kenny while he cued up a scorching guitar solo. That person nearly jumped out of their skin, much to Kenny's chagrin.

Since the Nevilles don't actually soundcheck, we rely on each other to do line checks and cross-mixes for Kenny. Kelsey will usually check all drums, percussion and the sax and vocal wireless units. Keyboard tech Eric Kolb will generally check keyboards, guitar, and bass. Kelsey, Eric, and myself help each other with cross-mixes (e.g., being at one mic position and having someone else speak or play an instrument so that Kenny can dial-in monitor mixes).

In spite of the fact that the band isn't there for the soundcheck, Kenny and I pretty much will have our mixes close once the band hits the stage. Then we'll communicate back and forth several times during the show to let each other know if the other is too loud. If Kenny hears any strange frequencies that are bothering the band on stage, he will give me a call on the intercom. We completed line check with plenty of time to spare, and once the Nevilles hit the stage, everything seemed to come together. The crowd was extremely enthusiastic, the band played great and the system performed excellently.

IT'S SHOWTIME

During the Nevilles's show, I don't use many effects except when Aaron comes front and does his solo stuff. I have a couple of reverb patches set up specifically for him as well as a nice chorus effect that I use on his voice (effects are usually a Yamaha REV-7, Yamaha SPX-90 II or Lexicon LXP-1 for reverb and Eventide H-3000, Yamaha SPX-90 II, Lexicon LXP-5, or Roland SDE-1000 or 3000 for chorus and delays). There are a few preset delays that Cyril requests during his songs and a reverb dedicated to wet Charles's sax. There's not a lot of room in the Nevilles's show to actually use the outboard gear.

Mixing through the TMS-3's was the equivalent of mixing in the studio on large playback monitors. I pretty much mixed this show just like I would mix any other Neville Brothers show. I really enjoyed the experience and it was pretty nice for the people in the catering area who weren't actually able to see the show, but they *definitely* heard it! The only times I actually had the opportunity to hear the system was while we were tuning the PA and while Carl was mixing the opening act. The major pain about hearing the PA was that you had to walk down a flight of stairs and then walk another 50–75 yards in front of the building.

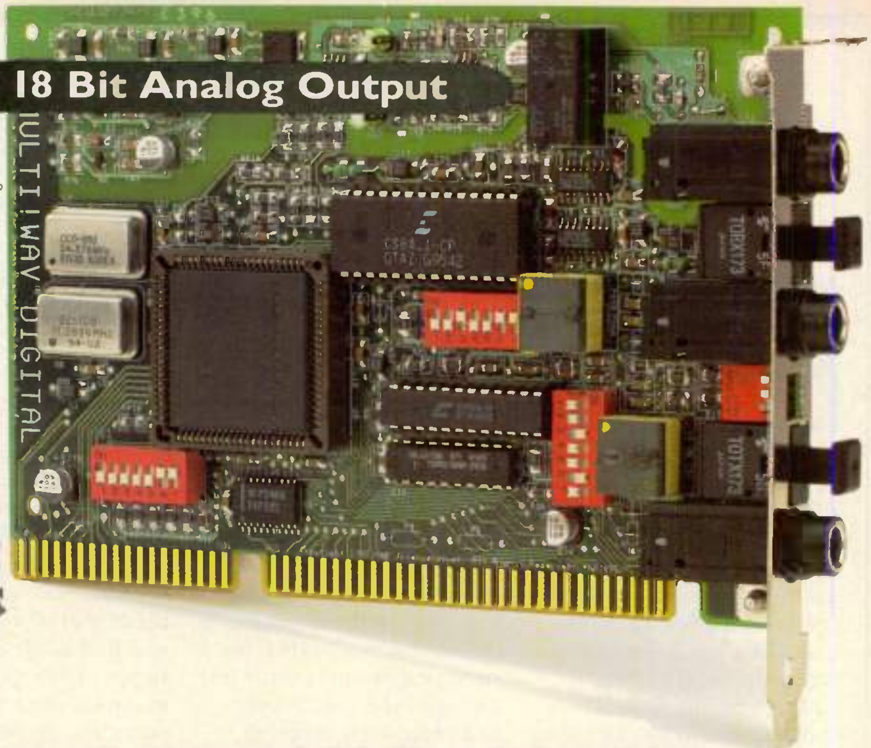
From past experience doing shows here, Carl and I knew that a major concern was 6 kHz bouncing off the wall from the building opposite the band. So he and I walked back and forth several times to listen and smoothed the system out. During the opening act's set, I went downstairs to check for Carl and everything was fine. He returned the favor during the Nevilles's set and he gave me the thumbs up sign.

My hat goes off to Kelsey, who worked miracles to maneuver a large drum kit and percussion rig on the narrow stage with such limited space. Kenny and I relied heavily on Kelsey to relay messages back and forth concerning the band's respective monitor needs during the show. With some smart forward planning by Eric Kolb, Kenny Nestor, and LDS Systems, things ran smoothly the whole day. And it certainly helped that the local crew and staff were also fantastic.

Nestor made the remark (after a couple of years of doing this gig) that this year's Mardi Gras was the most organized and well-run of all. We had a quick load-out after the show and then drove back to Houston to catch a flight to San Antonio that evening. We had a show to play after the NBA All-Star Game the following day, but that's an entirely different story!

In addition to being a front-of-house mixer, David Norman has worked as tour manager and production manager for such acts as Arrested Development, Peabo Bryson, Patti Austin, and many others. He also worked during Woodstock '94 and the WOMAD '94 and is currently the FOH Engineer for the Neville Brothers featuring Aaron Neville. You can contact him online at David994@aol.com.

24 Bit Digital I/O **18 Bit Analog Output**



Pictured: Multi!Wav Digital PRO 18

Professional
AES/EBU
Optical & Coaxial
S/PDIF

Digitally Interface to DAT Machines, HD Recorders, Samplers, MACs & other Computers, CD Players, Digital Consoles & Mixers, Broadcast Equipment, just about anything with a Digital Audio Interface! Real-Time Digital Format Conversion!

Presenting Multi!Wav Digital PRO: The ultimate card for direct digital sampling & transfer in Windows.

Use Multi!Wav Digital PRO to make digital masters, digital mixdowns, sample edits, and direct transfer of audio files with NO GENERATION LOSS!

Use Multi!Wav Digital PRO for real-time digital format conversion!

Multi!Wav Digital PRO is future upgradable! Add new HARDWARE features, such as 24 bit audio, from software!

Multi!Wav Digital PRO installs easily into your EXISTING setup - WITHOUT IRQs! Use it with any WAV editor, such as SAW, Sound Forge, Samplitude, Cakewalk PA ...

Best of all, Multi!Wav Digital PRO sounds great! Use it for your most demanding work.

Multi!Wav Digital PRO: The best in professional digital I/O for Windows.

Professional Digital I/O for Windows
95/3.1/NT

Multi!Wav Digital PRO/PRO18 Features	What you can do with Multi!Wav Digital PRO/PRO18
► **Professional AES/EBU Digital I/O Capability**	Direct digital sampling and transfer with any AES/EBU connection. Interface to DAT machines, hard disk recorders, digital consoles, broadcast equipment...
► **Optical & Coaxial S/PDIF Digital I/O Capability**	Direct digital sampling and transfer with any S/PDIF connection. Interface to DAT machines, CD players, samplers, Macs & other computers, digital mixers ...
► **High Quality 18 Bit Analog Output**	Clean 18 bit monitoring of digital output without need for "second DAT". Future upgradable to QUAD output for INDEPENDENT analog and digital outputs! (PRO18 only)
► **Real-Time Digital Format Conversion**	Convert Optical to Coaxial, S/PDIF to AES/EBU, or vice versa, in REAL-TIME!
► **Software Upgradable Hardware Design**	New HARDWARE features can be added from software, such as 24 bit audio & more!
► **Multi-Track Transfer Mode**	Free up CPU time! Increase multi-track software performance! Do 24 bit simultaneous record & play. (PRO18 only)
► **Shielded Transformers**	Reduce common-mode noise and clock phase jitter.
► **Flexible Ground Strapping**	Achieve optimal grounding configuration.
► **Independent Master or External Sync Clock**	Maintain sync during SRP for internal digital mixdowns... Sync [analog &] digital output to an external clock.
► **Multiple Card Support**	Use multiple Multi!Wav Digital cards in one PC.
► **256/512 Bit Upgradable RAM FIFO Buffer**	Improve performance reliability by reducing sensitivity to hardware underruns & overruns.
► **I/O Overload Protection**	Protect against misconnection of I/O up to 50 VDC.
► **LC Filtered Analog Supply**	Improve receiver PLL performance by reducing noise
► **Multi-Layer PCB**	Improve performance by reducing "digital" noise.
► **64 Selectable Addresses**	Eliminate hardware installation conflicts.
► **Professional Sample Rates**	48kHz, 44.1kHz, 32kHz (software selectable).

Multi!Wav Digital PRO Series is available in three versions: PRO18, PRO, & SP. Multi!Wav Digital (all versions) requires one 16-bit ISA bus slot; a computer that meets the hardware requirements of your WAV editing software; and digital I/O cables. 24 bit audio functionality requires a software upgrade. Please visit our Web site for the latest specifications. Specifications may change without notice. AdB and Multi!Wav are trademarks of AdB International Corporation. Made in USA.

NOW, bundled with Multi!Wav Digital PRO is Sound Forge XP, Winner of the 1995 Multi!Media World All-Star Competition. This offer is limited. Contact AdB International for details.

MULTIMEDIA WORLD ALL-STAR

SONIC FOUNDRY

Life-Time Warranty

AdB
PERFECT SOUND

Questions? Give us a call or visit our Web site.
AdB International Corporation • 2180 Pleasant Hill Rd. Suite A-5100 • Duluth, GA 30136
Voice: 770.623.1410 • Fax: 770.623.1629 • E-Mail: info@adbdigital.com • Web: http://adbdigital.com

CIRCLE 02 ON FREE INFO CARD

THE INS & OUTS OF VCAs

HOW TO ATTAIN BETTER LIVE SHOWS THROUGH VCAs AND SUBGROUPS

BY GREG PRICE

IF YOU'RE MIXING live sound, particularly shows with a lot of inputs, I'm sure that you have thought about (and probably used) VCAs and audio subgroups. When you have a drum kit on 15 channels, you'll want to do some kind of grouping in order to be able to make those drums louder or softer without having to move 15 faders individually. While subgrouping and VCA control can really make your life as a sound-reinforcement engineer easier, there seems to be a bit of confusion about the differences between VCAs and subgroups and when to use which. VCAs and subgroups are an essential part of the internal workings of a console. Their sole purpose is signal-flow management within the console for simplification of mixing duties.

BACK TO SCHOOL

A VCA by definition is a voltage-controlled amplifier. An external voltage is used to vary the gain of the amplifier, and this changes the level of the audio signal passing through the amp. In a VCA fader, the audio does not actually pass through the fader. Rather, the fader is used to change the voltage level applied to the amplifier, and this voltage change causes the gain of the amp to change. A VCA fader is really more like a remote control to the audio passing through a channel. Some of the benefits of using a VCA are a good signal-to-noise ratio, the ability to control postfader aux sends, and a cleaner signal path to the stereo bus.

An audio subgroup is a summing bus. When you assign a channel to an audio sub, the signal is sent to a summing amplifier that allows signals to be mixed together. An audio subgroup can be mono or stereo, but a stereo subgroup is really just a single fader controlling two completely separate audio paths at the same time (much like a stereo master fader). Unlike VCAs, the audio subgroup fader is controlling the actual audio signal. This is one of the most misunderstood and misused aspects of mixing consoles.

The stereo bus is the final set of summing amplifiers before the stereo output — the final summation points for all audio passing through the console. This stereo bus is like the final "receptacle" for the audio. I like to think of it as plumbing, almost like the main waste pipe in your home. Everything eventually winds up downstream in that pipe. Some people forget that when you get the stereo bus to it's maximum level, you cannot shove anymore water down that pipe. It gets full, and that is what often has happened to the novice engineer when their mix is sounding one-dimensional and small (we'll see how to avoid this in a minute).

EVERYTHING TO GAIN

Before you even consider dealing with VCAs or audio subgroups you need to address the gain structure of the console. Proper gain structure breeds clean and precise audio, allowing you to lower distortion while retaining stereo bus integrity. The foundation of proper gain structure starts at the input. By using conservative input levels and metering the VCAs and subgroups, the console can do what it was intended to: deliver clean audio signals to the stereo bus. It starts with setting PFL at the input channel. Let's take the kick drum as an example.

A lot of engineers think they have to PFL the kick drum channel and adjust the mic trim so that the meter shows '0' VU on the kick drum. That's not the case. It should be somewhere around –10 VU. This leaves room for the rest of the instruments in those downstream summing amps. If you start out with the engine revving really high, you have no place to go. But if you start with conservative levels, you can always get gain in other places like the crossover or the compressors (which is the classic way to get gain).

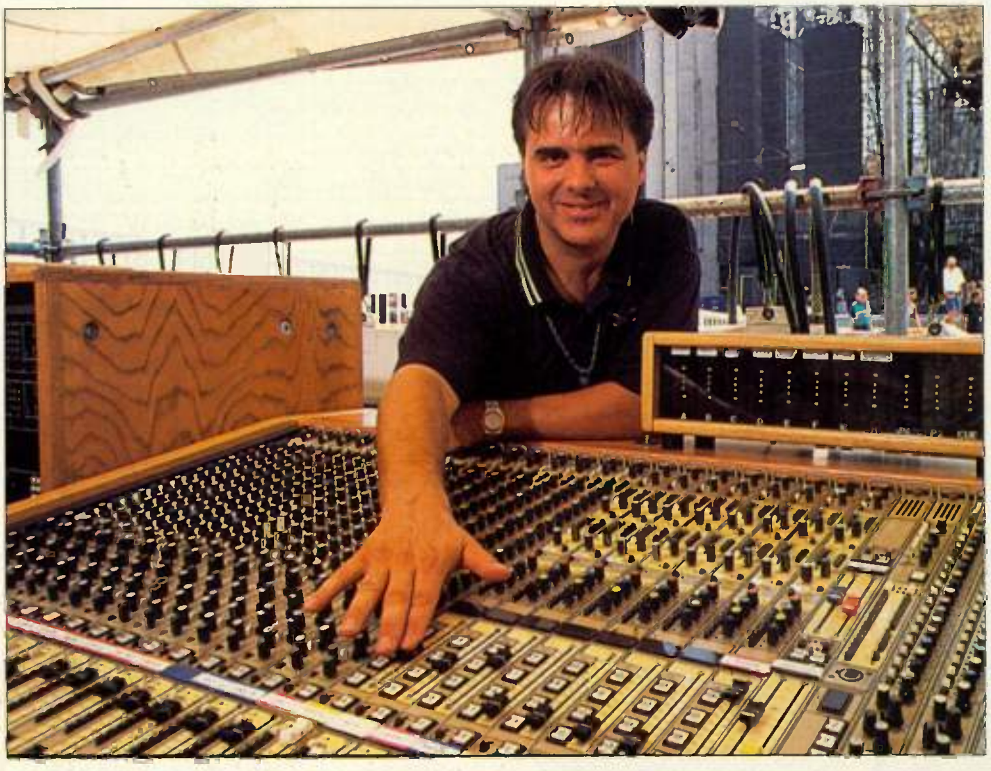


Photo by Julian Jaime

PRICE IS RIGHT: Currently on tour with Ozzy Osbourne (see *EQ* January '96) Price offers tips on grouping.

WRH

meet your next rack.
MR Rack.

RACK
mR
ENSONIQ
64 Voice Expandable Synth

64 Voices

12 Meg Wave ROM
Expandable to 84 Meg
(3 expansion card slots)

2nd -Generation
Transwaves™
(with digital resynthesis)

44.1 kHz Output

Four Outputs
(four 18-bit DACs)

All-new ESP-2 Effects
(26 MIPS of 24-bit DSP power)

SoundFinder™

GM Compatible

totally new
totally awesome

The MR-rack cuts no corners to give you great sound – with 44.1 kHz playback through hardware that measures in at an awesome 102 dB signal-to-noise level. *(Four 18-bit DACs sure help with that.)*

Our all-new waveform ROM has 12 meg of the best sounds you've ever heard, including bigger and better piano, strings, brass, and voices. Plus the second generation of our unique Transwaves™, using digital resynthesis to give you sounds that move and transform under your control.

Great waves become great sounds thanks to MR-rack's all-new synth engine. Each sound is crafted with up to 16 sonic layers, creating the most realistic acoustic and the wildest synthetic sounds imaginable.

Our next-generation effects chip *(ESP-2)* provides 6 stereo busses for total mixing flexibility. Studio-quality reverb and chorus are always available, plus your choice from a broad selection of insert effects. And our thoughtful design lets you change the insert effect while the MR-rack is playing, without affecting the chorus and reverb.

Forget you ever heard the term "MIDI mode". Working with the MR-rack is easy, because it's always ready to receive on 16 MIDI channels. And it's just as easy to set up splits and layers on a single channel.

We've made selecting sounds a breeze with our proven SoundFinder™ interface – one knob selects the sound type; the other knob picks the sound itself. And with hundreds of great sounds to pick from, you might never need to tweak one. But if you do, we made the most important sound parameters easily available for editing.

Want more? We thought so. The MR-rack has the best expansion options of any synth, with 3 card slots for up to 84 meg of wave data. And we give you tons of memory for your money. *(Three times what anyone else offers!)* Like our upcoming 8 meg Drums at only $250, the 20 meg Dance/Hip-Hop card at $425, and the 24 meg World and Piano cards at $500 each.

Need another incentive? OK, buy an MR-rack and we'll give you a rebate coupon worth $50 off your first expansion card. *(This is a limited time offer good until we come to our senses!)*

Whoops – ran out of room! So if you want to hear all the other totally cool things about the MR-rack *(like the PCMCIA card slot, the 4 outputs, or the Unisyn MR editor we'll give you)* just call us, write us, or visit your ENSONIQ dealer and say "I'd like to meet MR Rack!"

You can reach us at:
800-257-1439 documents to your fax
http://www.ensoniq.com *on the Web*
GO MIENSONIQ *on CompuServe*
800-553-5151 phone
610-647-8908 fax

ENSONIQ

☐ ***Yes!***
I want to meet
MR Rack!

I'd also like info on:
☐ TS Series *synths*
☐ ASR Series *samplers*
☐ KT Series *weighted action synths*
☐ KS-32 *weighted action synth*
☐ SQ Series *synths*
☐ DP Series *parallel effects processors*
☐ 1682-fx *mixer*

Name ______________________
Address ______________________
City ______________________ *State* ______ *Zip* ______
Phone (______) ______________________

Mail to: ENSONIQ Corp, Dept. Q-59, 155 Great Valley Pkwy
P.O. Box 3035, Malvern, PA 19355-0735

CIRCLE 24 ON FREE INFO CARD

If you mix on a good console, run it cool and get a good mix, it will sound like a million dollars at the other end. Keep in mind that the true test of the quality of summing amps in a console comes when you try testing the diameter of that pipe. That's when you'll hear that some are made out of plastic and some are made out of copper. The walls give in because they cannot handle the pressure and the pounds-per-square inch. With a conservative flow of water, you can always put a Turbo jet at the end of it to make it loud!

You can even do some PFLing by yourself at the console. If your singer is using a Shure Beta 58, there is no reason why you cannot plug the same mic into the same channel, count to ten in an even tone, and get the proper level. With no EQ and no outboard patched in, I like to have a vocal mic PFL at around –7 to –10 VU. This way if the singer yells, the level might come up to 0 VU. Now that you have good gain structure you can start EQ'ing the sound. Think about this: if you start with PFL at 0 and then add EQ, before you know it the channel has 20 dB of gain. Now if your kick and snare are at that kind of level, is there going to be any room for the guitar or bass? You have to make room for everybody to live in the stereo bus, including all of the instruments, vocals, and effects.

Now that you have the input level set correctly, you can check PFL at the audio subgroups. Bring the input fader to unity — because that's where it wants to live (especially if there are VCAs involved). There's a reason why manufacturers silkscreen that little mark next to the fader at unity. Now let's say I have just PFL'd Ozzy's vocal mic at –10 and set the input fader to unity. If I assign this mic to audio subgroup one, bring the subgroup fader to unity and PFL the group, then I should see the exact same level as the input PFL. If not, there is a problem somewhere.

I use a 1k tone to align all of my subgroups before I assign any channels to the subs. It's simple: bring a 1 kHz tone up on the console and make sure it reads 0 VU. Then assign the tone to the audio subgroups one at a time. Once you park the audio subgroup fader at unity, then you had better see 0 VU on the meter. This is a great test to make sure the console is in proper working order. And since you know what the tone is supposed to sound like, you can *hear* any problems as well. All of the audio subs are acting as volunteer firemen, carrying buckets downstream to the stereo bus. But if you overflow the bucket at the source, you are screwed. Remember the old saying "junk in, junk out?" Well that's where it came from.

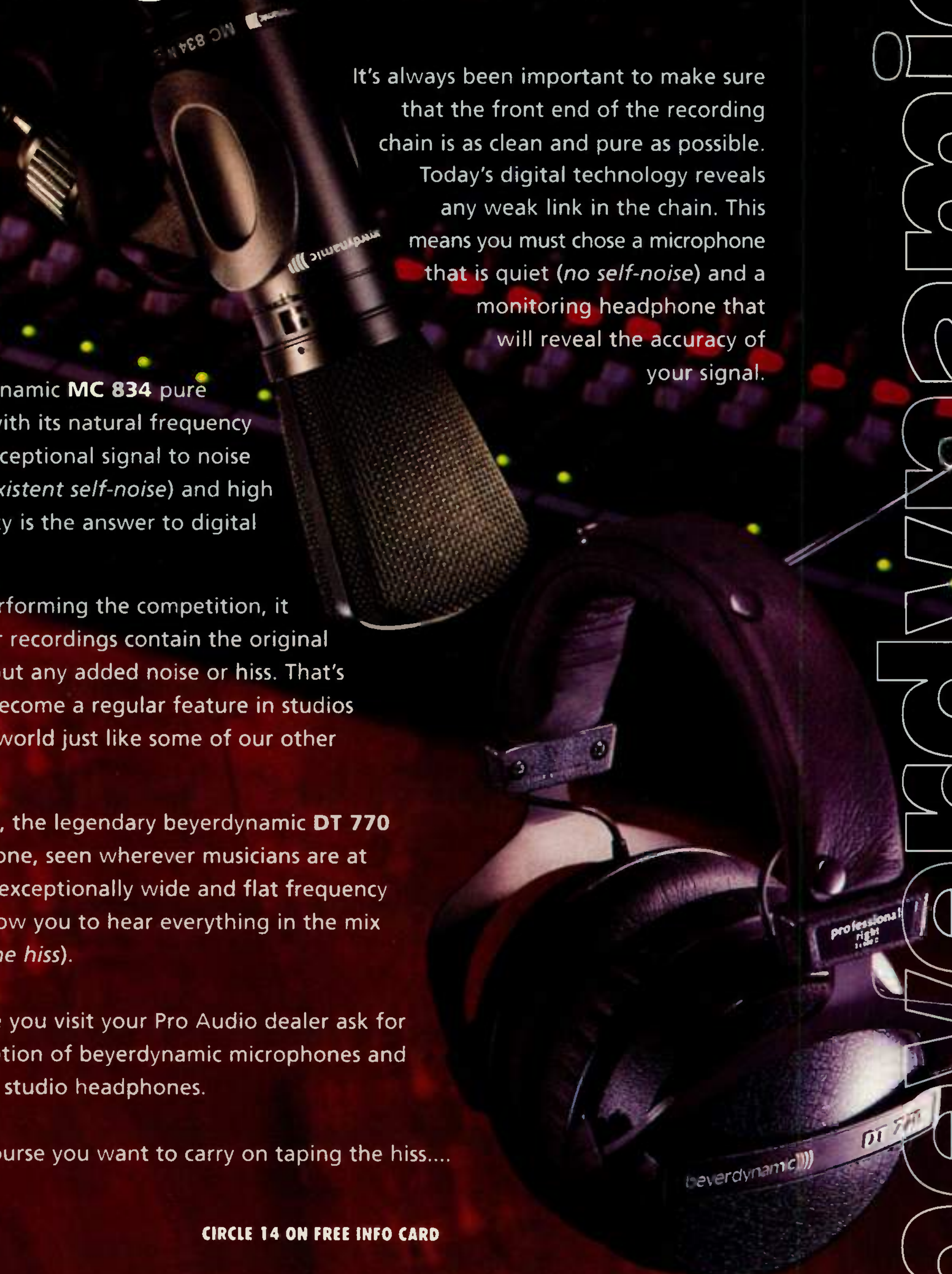
HOMEWORK ASSIGNMENT

On most consoles, the input strip has a series of pushbuttons for assignment (some consoles have a thumbwheel next to the

DIRECT BOX • RECORDING • LIVE SOUND
• Extremely high input impedance
• Parametric mid-range control
• Full-function BBE
• Switchable notch filter
• Low impedance output
"The 386 offers a functional and inexpensive way to squirt your acoustic amplified signal into a recording console or P.A. mixer – AND tweak the sound in the process."
Guitar Player Magazine
Acoustification®
386 ACOUSTIC PREAMP
INPUT
GAIN
LOW CONTOUR
DEFINITION
BBE PROCESS
IN
LEVEL
FREQUENCY
PARAMETRIC
NOTCH F
BBE®
CIRCLE 12 ON FREE INFO CARD
5381 Production Drive • Huntington Beach, CA 92649 • ☎ (714) 897-6766 • Fax (714) 896-0736

ARE YOU TAPING THE HISS?

If so you need the ultimate recording combination.



It's always been important to make sure that the front end of the recording chain is as clean and pure as possible. Today's digital technology reveals any weak link in the chain. This means you must chose a microphone that is quiet (*no self-noise*) and a monitoring headphone that will reveal the accuracy of your signal.

The beyerdynamic **MC 834** pure condenser with its natural frequency response, exceptional signal to noise ratio (*non existent self-noise*) and high SPL capability is the answer to digital technology.

Easily outperforming the competition, it ensures your recordings contain the original sound without any added noise or hiss. That's why it has become a regular feature in studios around the world just like some of our other products.

For example, the legendary beyerdynamic **DT 770** pro headphone, seen wherever musicians are at work. Their exceptionally wide and flat frequency response allow you to hear everything in the mix (*including the hiss*).

So next time you visit your Pro Audio dealer ask for a demonstration of beyerdynamic microphones and professional studio headphones.

Unless, of course you want to carry on taping the hiss....

CIRCLE 14 ON FREE INFO CARD

For more information or a brochure call 1.800.293.4463
56 Central Ave. Farmingdale, NY 11735

beyerdynamic

fader for this purpose). For example, the Yamaha PM4000 has eight pushbuttons for assigning a channel to a VCA group. Then there are also a set of eight pushbuttons for assignment to the audio subgroups. So making the actual assignment process happen is as easy as the flick of a switch. But you must make intelligent decisions about whether to assign to a VCA, an audio subgroup, or both. Let's again take the drums as an example.

I usually assign the kick and snare drum mics to one VCA (that's a total of four mics: main kick, secondary kick, snare top, and snare bottom). I then assign all of the toms and cymbals to another VCA. Notice that even though the toms and cymbals are going to be stereo panned, I only need *one* VCA to control them. This is because the VCA is only serving to control the voltage of the amplifiers in those channels — panning is still done from the input strip. So now I have two VCA faders controlling the entire drum kit.

The cool thing about VCAs is that more than one VCA can simultaneously control the same input channel. So I could also assign all of those drum channels to a third VCA, which can then be used to adjust the volume of the entire kit. The other two VCAs still control the kick/snare group and the tom/cymbal group so I can balance those elements of the kit and then raise the overall volume with the third VCA fader (it's important to note that on consoles with thumbwheel assign, you cannot double-assign inputs).

The options are infinite and can get very complicated. Take a big band like Chicago. You could assign the drum mics, keyboards, guitars, bass, and horns to their own different VCA groups and then still assign all of those inputs to yet another VCA for a "band volume" control, while at the same time assigning the vocal channels to another VCA. Then it all comes down to one VCA for the band and another for the vocals. And in double-assigning to VCAs, you are still dealing with the same exact audio path but a larger number of controllers. Whereas if you try to double-assign these channels to more than one audio subgroup, you are changing the amount of gain stages involved in getting the signal to the L/R master (stereo bus) and you are running the signal through extra stages of summing amplifiers.

When you assign an input channel to a VCA, you will notice something interesting about the auxiliary sends. You already know that if you move the VCA fader, the level of an assigned channel changes. Following that logic, the level of signal at a postfader send must also change,

continued on page 124

The Original
Revolution

Equitek E-200

E-200 Shown with optional ZM-1 Shock Mount

Introduced in 1989, as the Equitek II, the first microphone under a $1000.00 featuring:

- State of the art servo head amplifier, eliminating coupling capacitors phase anomalies and feedthrough distortion.
- High SPL capabilities (148dB), providing tremendous ballistic integrity
- Non capacitive 20dB pad
- Proprietary H-frame internal shock mount, isolating capsules from most vibrations
- High fidelity audio reproduction

.....CAD created a revolution in the microphone industry by redefining high end performance and great value. With continual enhancements the E-200 has established a bench mark which remains to be equaled or excelled.

Every hour of every day, in thousands of project and world class studios around the world, Cad Equitek servo-condenser microphones continue to provide a unique level of performance, with a unparalleled return on investment.

Also available in matched pairs.

Join the Revolution!

CAD
Conneaut Audio Devices

For a CAD dealer near you call: 1•800•762•9266

a division of CTI Audio, Inc. 341 Harbor St. Conneaut, OH. 44030
Phone (216) 593•1111 Fax (216) 593•5395

CIRCLE 17 ON FREE INFO CARD

OUT OF THIS WORLD LOW DISCOUNT PRICING!

MICROPHONES

• AKG • Audix • Audio-Technica • Beyer • C-Ducer • CAD-Equitek • Countryman • Crown • Electro-Voice • Groove Tube • Microtech-Gefell • Ramsa • Samson • Sennheiser • Shure • Sony • Vega

HEADPHONES & INTERCOMS

• AKG • Audio-Technica • Beyer • Clear-Com • Fostex • Koss • RTS • Shure • Sennheiser • Sony • Telex

MIXERS

• Alesis • Allen-Heath • Bogen • Electro-Voice • Fostex • Furman • Gemini • Intelix • Mackie Designs • MTX • Radio Systems • Ramsa • Rane • Rolls • Samick • Shure • Sony • Soundcraft / Spirit • Soundtech • Soundtracs • Stewart • Studiomaster • Tascam • TOA • University Sound

SPEAKERS

• Alesis • Anchor • Audix • Bag-End • Electro-Voice • Galaxy • Genelec • JBL • Klipsch • KRK • PAS • Ramsa • Turbosound • University Sound

CD PLAYERS, TURNTABLES

• Denon • Gemini • Marantz • Shure • Stanton • Tascam • Teac • Technics

400+ Product Lines

Check out our specials on the World Wide Web at www.fullcompass.com

RECORDERS

• Akai • Alesis • Digidesign • Digital Audio Lab • Fostex • JVC • Marantz • Otari • Roland • Sony • Tascam • TEAC • Technics • Telex

SOFTWARE/ELECTRONIC MUSIC

• Digidesign • Digital Audio Labs • Opcode • Roland • Sound-Forge • Waves

TV/VIDEO

• Bogen • JVC • Fast • Horita • Lowel-Light • Panasonic • Porta-Brace • Sony • Telex • Videonics

STELLAR PRICES!

ON NEW, DEMO & CLEARANCE ITEMS

CALL!

MEAT 'n POTATOES

Full Compass carries tape, patchbays, connectors, chemicals ... all the audio, video and lighting accessories you need!

AMPLIFIERS & PRE-AMPS

• AB International • Alesis • BGW • Bogen • Carver • Crown • Electro-Voice • Hafler • JVC • QSC • Ramsa • Stewart • Technics • TOA • University

SIGNAL PROCESSING

• AB International • Alesis • Aphex • ART • Ashly • Behringer • BBE • Brooke-Siren • dbx • DOD Digitech • Drawmer • Electro-Voice • Eventide • Furman • Klark-Teknik • Lexicon • Rane • Sabine • SPL • Symetrix • Tascam • TL-Audio • TC Electronics • Valley Audio • White • Zoom

1-800-356-5844

GET YOUR FULL COMPASS CREDIT CARD TODAY!

- No annual fee
- Quick credit approval
- Apply by mail or fax
- Will not deplete other lines of credit

CIRCLE 92 ON FREE INFO CARD

Ask for our FREE catalog!

(608) 831-7330 • Fax (608) 831-6330
8001 Terrace Ave.
Middleton, WI 53562

Award Winning Dealer!

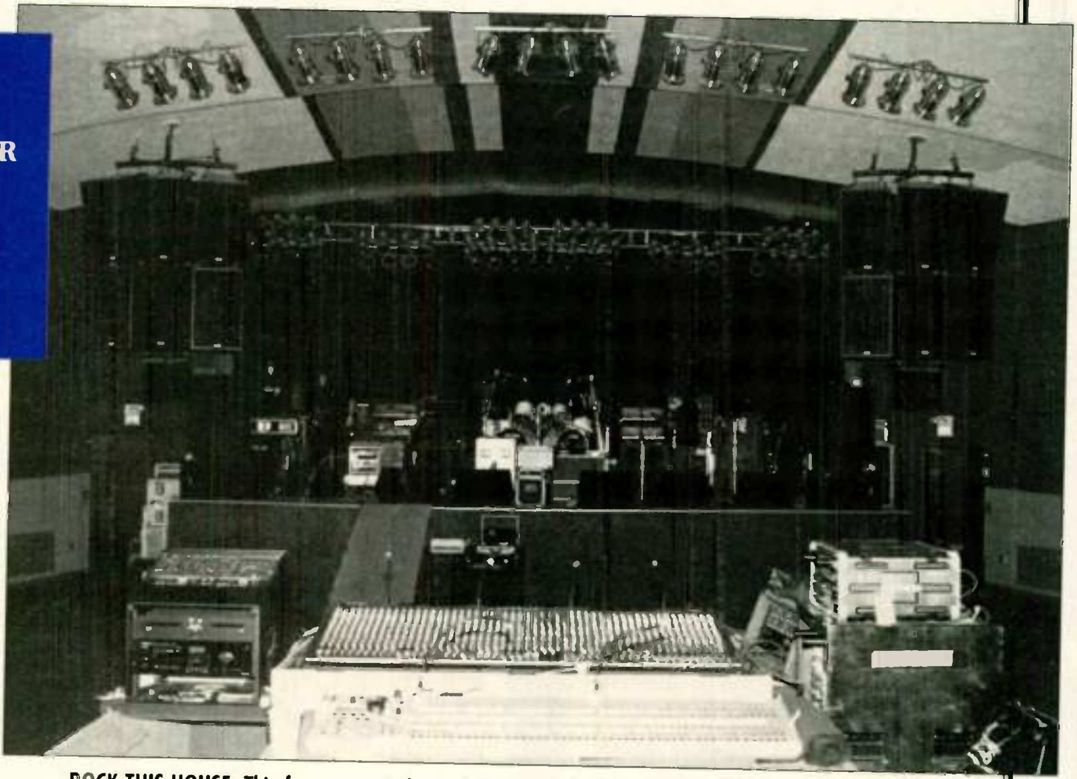
FULL COMPASS

Audio • Video • Lights

CLUB PROFILE: THE WEBSTER THEATER

THIS HARTFORD, CT VENUE MAKES ENGINEERS QUESTION: IS IT A CLUB OR A THEATER?

BY GARY SCOTT PECK,
HOUSE SYSTEMS ENGINEER,
WEBSTER THEATER



ROCK THIS HOUSE: This former movie house has solid sight lines — like an indoor amphitheater.

THE WEBSTER THEATER has been at its present location in Hartford, CT since it was built by Albert Shulman back in 1939, who owns it to this day, and is managed by his daughter, Justine Robertson. The theater had been used for showing movies, but before we came in, it was dead for about three or four years. Since the city is trying to develop this particular area, the Webster had their blessing as a nice place in town to do shows. The Webster is clean and has great sight lines — it's like an indoor amphitheater. It's raked and built the way a theater is supposed to be, reminding me more of a Las Vegas or Atlantic City theater than a club.

ALL SYSTEMS GO...

North American Theatrix, LTD did the sound-reinforcement install supervised by myself and company president Jeff Mele, who was a major factor in the install. When we first saw the room, it was in very good shape — much the same as it is right now except for the fact that the theater chairs were still in the room (they were removed). The rake was there as was a small stage. Before we did anything, we needed to find out what the owners wanted to do with the venue — which was to turn it into another Bushnell or Strand Theater.

We realized that we'd have to put in a flown system and we'd need flying points for road shows as well. Under those parameters, we got a structural engineer to come in and reinforce the truss in the ceiling so that we could safely fly PA and lighting. Our decision to fly the PA came from two main reasons: first, it maintains better sight lines to the stage, and second, in this kind of room you need to get the focus of the system down towards the floor (where the audience is) and keep the reflections off the back wall as much as possible. Ground-stacking the cabinets points them straight towards the rear wall and increases the reflections back towards the listening area. So this array is angled downward towards the mix site, focused for that spot. Knowing the horn dispersion of these cabinets, we knew that the sound would still reach the back areas of the club.

While we were designing the system, we knew that it should have gear that engineers were familiar with and wanted to use. EAW loudspeakers seem to be on everybody's tour rider these days, so we decided to put in (per side) three KF850's (for mids/highs), three SB850's (double-18-inch sub bins), and two JF100 cabinets. The main guts of the system comes from the KF850's and the SB850's. From underneath the subs we hung the JF100 full-range cabinets. Those serve to fill in for people who are standing up close to the stage. The JF100 cabinets are high-passed at about 200 Hz to protect them from too much low end.

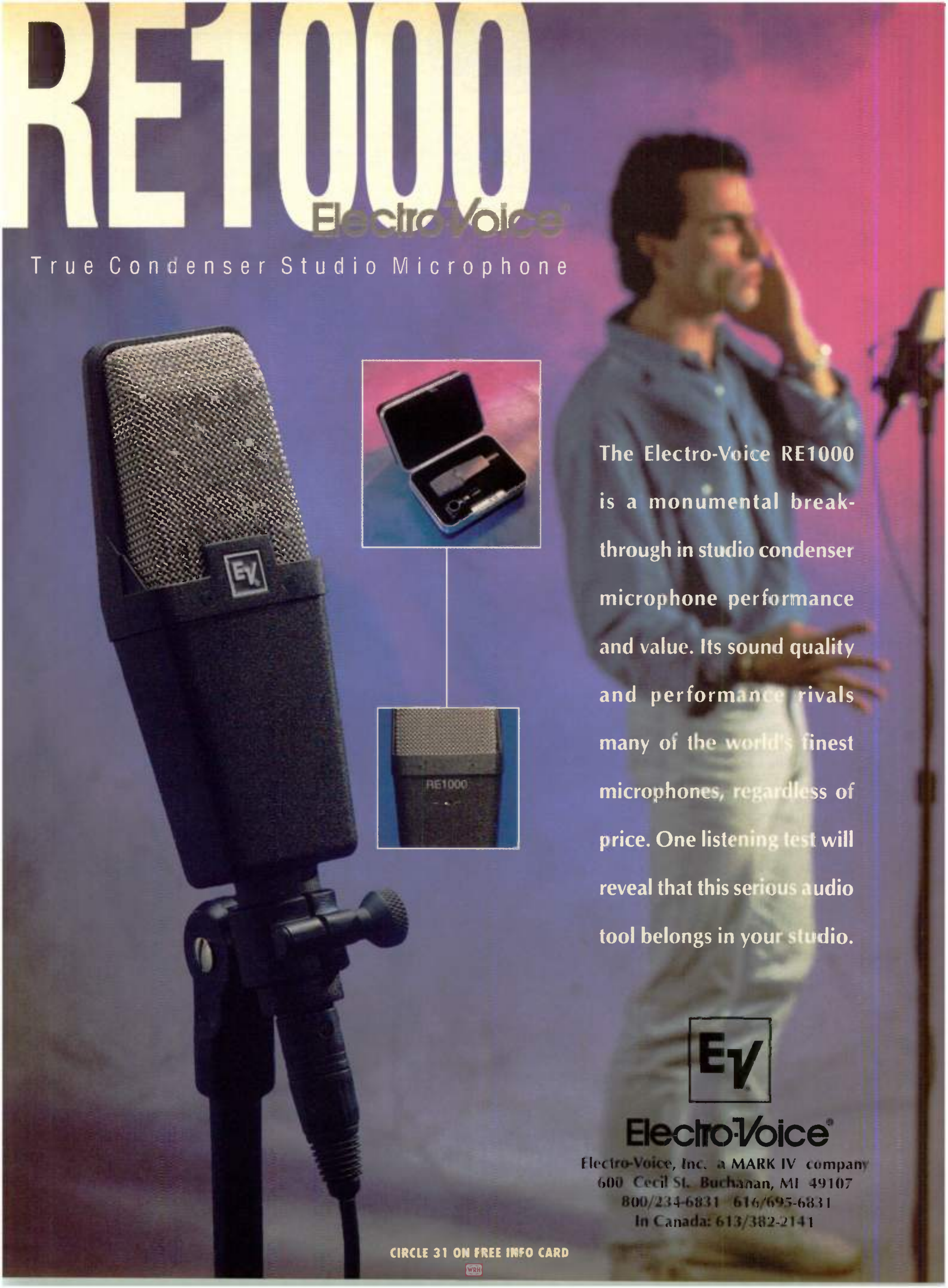
Crossover, limiting, equalization, and time delay functions are handled by Electro-Voice DX-34 four-way (mono) digital processors. We've tested the E-V processors on different systems, and we like them a lot because they are flexible and sound great. You can change crossover slopes and other parameters, which some processors don't allow you to change. When this room is full, obviously the sound changes, so the flexibility of the E-V DX-34 is useful. We can have one group of settings in memory for a full room and then another different set for when the room is half-full. Sometimes there are bomb shows where there's only a few hundred people and we can shut off the outside cabinets on the flown system to reduce the reflections from the side walls. The JF100s are also run off a DX-34, but it is basically just for time delay and for sloping the frequency response below 200 Hz so that the cabinets don't receive too much bass information.

System limiting is handled by the E-V processors,

RE1000

Electro-Voice

True Condenser Studio Microphone



The Electro-Voice RE1000 is a monumental breakthrough in studio condenser microphone performance and value. Its sound quality and performance rivals many of the world's finest microphones, regardless of price. One listening test will reveal that this serious audio tool belongs in your studio.

Electro-Voice®

Electro-Voice, Inc. a MARK IV company
600 Cecil St. Buchanan, MI 49107
800/234-6831 616/695-6831
In Canada: 613/382-2141

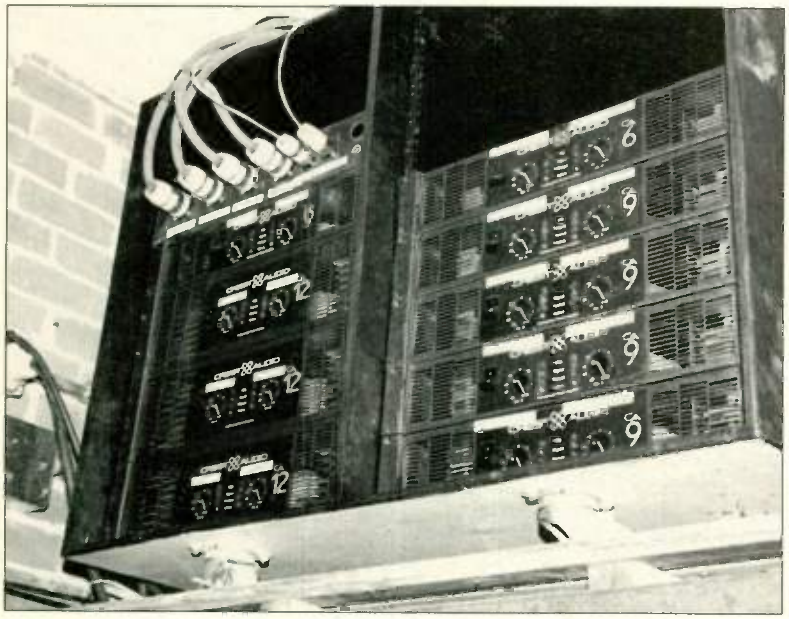
CIRCLE 31 ON FREE INFO CARD

WRH

but you really have to jump on the system for them to kick in. Quite honestly, I have yet to hear a mix get squashed by them — it would have to be pretty loud in that room for them to kick in. They are more for prevention if someone inadvertently kills the power on a breaker to the house processing and not for compression like you might use a dbx unit. I have them set so that they are transparent and not very noticeable.

Both the PA mains and the monitor system are powered completely with Crest amplifiers. We are running three Crest CA-12's for the subs and five CA-9's for the lows, mids, and highs. In the front bar there are a pair of EAW JF80 full-range speakers powered by a Crest FA-601 amplifier. These cabinets are time-delayed to the main system using a Rane AD-22 delay. The signal going to the JF80's is basically a split off the nearfield-fill at the front of the stage, so it carries the same information as the JF100's

For the house console we chose a Crest GT-40 (40x8x2), which is routed through a Klark-Teknik DN360 stereo 1/3-octave graphic EQ. The EQ is open for tweaking by the band engineer, as long as either Jeff or myself is around to make sure someone doesn't get carried away! Effects at FOH include a Lexicon PCM 42 delay, Yamaha SPX-900's, Drawmer gates, and dbx compressors, but if there's a special request for a specific unit, we'll try to accommodate that.



PLUG IN: The PA mains and monitor system are powered by Crest amps.

MONITORS

Typically for stage monitors, we use a cabinet that I custom-designed for Audio Technologies, Inc. (Watertown, CT) consisting of two 12-inch McCauley woofers and a DDS 2-inch fiberglass horn on a JBL 2446 driver. Unlike a lot of monitors, the woofers are rear-loaded while the horn is front loaded. The baffle board is made of two, 3/4-inch pieces of Baltic birch, making the overall thickness of the baffle an inch and a half. My goal was to get the voice coils of the 12's in the same plane as the voice coil of the horn for time alignment. Mounting the 12's from behind and the horn from the front just about puts the voice coils of all three drivers in a line. So the drivers are in perfect time alignment naturally — without any processing. Not only that, but we are also finding that the little inch-and-a-half space we gain by rear mounting the 12's, gives you sort of a horn-loading for the woofers. That little bit (plus the rim of the speaker basket) makes a big difference compared to front-loading the woofers. It's almost a 2-inch horn, and it makes a real difference. These monitors are working out real well, and we are finding that acts coming in really like them. They do need dips at around 315 Hz and 8 and 10 kHz, which we can do with the Ashley GQX 2031 graphic EQs (third-octave, 31 band).

In general, we find that there is much better bottom-end from a 2x12 monitor than from a monitor with a 15-inch woofer. Twelve's are quicker, and I think that to get the vocal to cut through a loud guitar band, you need a faster cone. In terms of surface area there's more air to be moved with two 12's coupling together than with a single 15. We have 12 of these monitor cabinets and a total of 14 mixes can be run from the Crest LM-40 (40x20) monitor console (if we need the extra muscle for a drum fill, we have a double-18 box to supplement the 2x12's).

POWER PLAY

When it came to powering the monitors, we used an approach that is a little bit out of the ordinary. There are six mix-racks for the biamped monitors, with Crest 7001's on the low end and CA-6's on the high end. Instead of the usual active crossover, we decided to use Crest Octal modules for the crossover. On Crest's pro series amps like the 7001, 8001, 9001, etc., there is an Octal socket on the rear panel that supports a plug-in processor for crossover and limiting without having to use outboard units. By plugging in an Octal module (such as the LX-2.1 crossover/limiter), one channel produces low frequencies for the woofer and the other channel does high frequencies for the horn. They were originally designed for the 7301 amps, which had the ability to push about 800 watts on one side (for the low end) and 200 watts on the other side (for the high end). This allows you to use one power amplifier per biamped mix with the (accurate) assumption that you need more power for the lows than for the highs.

Now these modules work in pairs, but we really wanted more power for the high end, so we decided to use Crest CA-6's for highs. But the CA-6 doesn't have an Octal socket for the plug-in. We took a blank, two-space rack panel and mounted six pairs of Octal sockets on the front, one above the other (each pair acts on one mix). The Octal modules plug into these sockets and do their thing. The socket outputting the high end is terminated with an XLR connector that feeds high-frequency input to the CA-6. The other Octal is basically an extension to reach the 7001, which provides power to the active circuitry in the modules and then outputs the low end on another XLR. I built two identical racks like this for 12 biamped mixes (six per rack) with a 30-amp circuit to each one.

With active crossovers, as soon as you plug in there

continued on page 124

WRH

THE BIG WINNER IN AFFORDABLE 8 BUS MIXING CONSOLES!

MIXDOWN CLASSIC 8

"The classic 8's EQ is totally brilliant!"
----Michael Molenda, Electronic Musician Magazine, January 1996

MIXDOWN CLASSIC 8
Studiomaster
MIXDOWN CLASSIC 8

When it comes to choosing the right 8 bus mixing console, certain things need to be carefully considered. It may start with features and price, but sound quality and performance will most certainly be the deciding factors. The award-winning Mixdown Classic has all the features you want plus superb audio specifications, proven reliability and the performance you need. All this at a groundbreaking price for consoles in this class.

To prove our point, the Mixdown Classic 8 recently ran away with Electronic Musician Magazine's Editor's Choice Award for Best Recording Console for 1996. It was also nominated for a TEC Award and has received nothing but critical acclaim worldwide. The Mixdown Classic 8 provides features not found on consoles in this price range, such as its comprehensive MIDI MUTING system, internal modular design and an optional meter bridge.

MIXING WITH THE BEST!

"In a side by side contrast, the Mixdown Classic blew the Brand 'X' 8 bus away in sonic quality!"
----Michael P. Barton, Appleton, WI

"Great *&#@#*^ board...just great!"
----Sean Nolan, Denver, CO

"Studiomaster Mixdown Classic -I love you, man!"
----Jay Olsiek, Savannah, GA

- 16, 24 and 32 channel versions
- Midi Muting
- 3 band EQ w/mid & bass sweep
- 6 aux sends per channel
- Balanced mic inputs on every channel
- Channel direct outputs
- Optional full-width meter bridge
- Rackmount external power supply

Studiomaster **IT'S ALREADY A CLASSIC!**

3941 Miraloma Ave., Anaheim, CA 92807 • 714-524-2227 Fax: 714-524-5096 Internet: http://www.studiomaster.com
Studiomaster House, Chaul End Lane, Luton, Beds, LU4 8EZ UK • Tel: 1582 570370 Fax: 1582 494343

CIRCLE 62 ON FREE INFO CARD

NEW GEAR FOR YOUR NEXT GIG

Renkus-Heinz P2800

ROCK WITH RENKUS

Renkus-Heinz, known for its speaker line, now enters the amplifier market. The P2800 and P2800A were developed to complement Renkus-Heinz CoEntrant and Complex Conic loudspeakers. The P2800 includes protective circuitry to safeguard against damage from heat, subsonic, and ultrasonic signals, and DC appearing in the output. A clip protection circuit also prevents signal clipping, while a soft turn-on circuit complete with output muting protects against turn-on thumps and transients. Additional features include: status LEDs, a combination power on/off switch, and magnetic circuit breaker. The P2800A includes provisions for plug-in controller modules that provide third-order (18 dB/octave) crossovers and parametric EQs. For more information, contact Renkus Heinz, 17191 Armstrong Ave., Irvine, CA 92714. Tel: 714-250-1035. Circle EQ free lit. #120.

NO PEAKING!

The 1034 electronic crossover/limiter from dbx features the company's proprietary PeakStopPlus limiting on every band of its two channels. The single-rack-space dbx 1034 provides either three-way stereo or four-way mono (back panel switch-selectable) for medium to large multiband sound-reinforcement systems. The crossover offers the option of a summed low-frequency output (mono subwoofer out), as well as a switchable circuit that adds pre-emphasis for constant directivity horns. Inputs and outputs are RFI-filtered, while outputs are electronically servo balanced to maintain consistent levels into balanced or unbalanced loads. All rear-panel input and output jacks are gold-plated Neutrik XLR-type connectors. Each channels' output gain may also be adjusted ±12 dB, while an optional security panel may be attached to protect control settings. For more details, contact dbx Professional Products, 8760 South Sandy Parkway, Sandy UT 84070. Tel: 801-568-7660. Circle EQ free lit. #121.

INTERNAL AFFAIRS

Designed to provide pickup of acoustic guitars and other string instruments, the new PRO 95 from Audio-Technica is a wide-range, fixed-charged condenser microphone with a cardioid polar pattern. The PRO 95 can be mounted inside of a guitar via its "rubber-grip" spring clamp and flexible boom. The in-line power module operates at 1.5 volts and is located just over four feet from the mic. The cable terminates in a standard 1/4-inch phone plug designed to plug directly into a mixer, amplifier, or other electronic device. The PRO 95 also includes a power module clip, battery, and windscreen. For optional permanent installation, an end-pin jack and 1/4-inch phone plug are also included. For more details, contact Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, OH 44224. Tel: 330-686-2600. Circle EQ free lit. #122.

audio-technica
Audio-Technica PRO 95

HEY, TXI!

Yorkville Sound's TX series large-format speaker systems are designed for larger concert venues and touring applications. The systems feature processor-controlled trapezoidal enclosures with 2-inch high-frequency drivers, Speakon connectors, custom-fitted ATM Fly-Ware with steel flytracks, and black painted 13-ply Baltic birch. Enclosures include the tri-ampable, three-way TX8 (2x15" LF, 1x8" mid, 1x2" HF) with matching TX8S dual 18" subwoofer; the bi-amp TX4 (1x15" LF, 1x2" HF); the bi-amp TX3 (1x12"LF, 1x2"HF); and the bi-amp TX2M (1x12" LF, 1x2" HF) low-profile floor monitor. Systems also incorporate single space 19-inch

Yorkville TX Series

dbx
CHANNEL ONE
CHANNEL TWO
1034
dbx 1034

rackmountable multichannel, self-calibrating processors with balanced XLR inputs and outputs. For more information, contact Yorkville Sound Inc., 4625 Witmer Industrial Estate, Niagara Falls, NY 14305-1390. Tel: 716-297-2920. Circle EQ free lit. #123.

TAKE SOME NOTES

Spirit's Folio Notepad is their smallest and most affordable Folio mixer yet. Despite its compact size, the Notepad achieves DAT-quality audio as a result of its surface-mount design and use of components common to larger Spirit consoles. The Folio Notepad features ten inputs including four mic inputs and two stereo inputs; studio-quality mic preamps with 50 dB of gain range; two bands of EQ on every mono input; global +48-volt phantom power; stereo inputs equipped with switchable RIAA preamps for turntables; 2-track return for playback of masters; peak and VU metering; headphone output; and custom designed rotary controls. The Spirit Folio Notepad is available at a manufacturer's suggested retail price of $249.95. For more details, contact Spirit by Soundcraft, Inc., 11820 Kemper Road, Auburn, CA 95603. Tel: 916-888-0488. Circle EQ free lit. #124.

Spirit Folio Notepad

Rane Mojo Series

MR. MOJO'S RISING

The Mojo Series by Rane includes five models of single-space rack units. Currently, the line includes the MH 4 ($299) four-channel headphone amplifier; the MX 22 ($299) stereo two-way crossover with additional mono sub output; the MX 23 ($399) stereo three-way crossover with additional mono sub output; the MQ 302 ($399) stereo 1/3-octave graphic equalizer; and the MC 22 ($299) stereo compressor with the company's "adx" circuitry, which helps to improve signal-to-noise performance. All units (except the MH 4) come with balanced XLR-type connectors. The MQ 302 and MC 22 also include balanced 1/4-inch connectors. For further information, contact Rane Corporation, 10802-47th Avenue West, Mukilteo, WA 98275-5098. Tel: 206-355-6000. Circle EQ free lit. #TK.

SHOOK UP

With a new 18-inch driver, Cerwin-Vega's Intense! Series T-36/750 build on the company's L-36 "Portable Earthquake." Boasting twice the power handling of the L-36 and a 4 dB gain in sensitivity, the Intense! T-36/750 features a contoured aluminum woofer door and an increased woofer chamber size, which dissipates heat and increases the overall power handling. The Intense! T-36/750 cabinet is finished in tailored dark gray carpet. For more information, contact Cerwin-Vega, 555 E. Easy Street., Simi Valley, CA 93065. Tel: 805-584-9332. Circle EQ free lit. #125.

Cerwin-Vega Intense! Series

WHAT'S THE FREQUENCY

Featuring technology first incorporated in AKG's top-of-the-line WMS 900 UHF system is the company's new WMS 300 UHF wireless system. The WMS 300 System features ten different microphone combinations, up to 16 different frequency options within 20 MHz bandwidth, and the ability to simultaneously operate up to eight different units. The SR 300 receiver features a half-width rack design and provides for up to ten different microphone sets. Each microphone is designed for optimum use in either vocal or instrumental applications. The WMS 300 transmitter provides up to 12 hours of continuous operation with alkaline batteries and more than five hours of operation with rechargeable ones. For more details, contact Harman Pro North America, 8500 Balboa Boulevard, Northridge, CA 91329. Tel: 818-227-1800. Circle EQ free lit. #126.

GET IN LINE

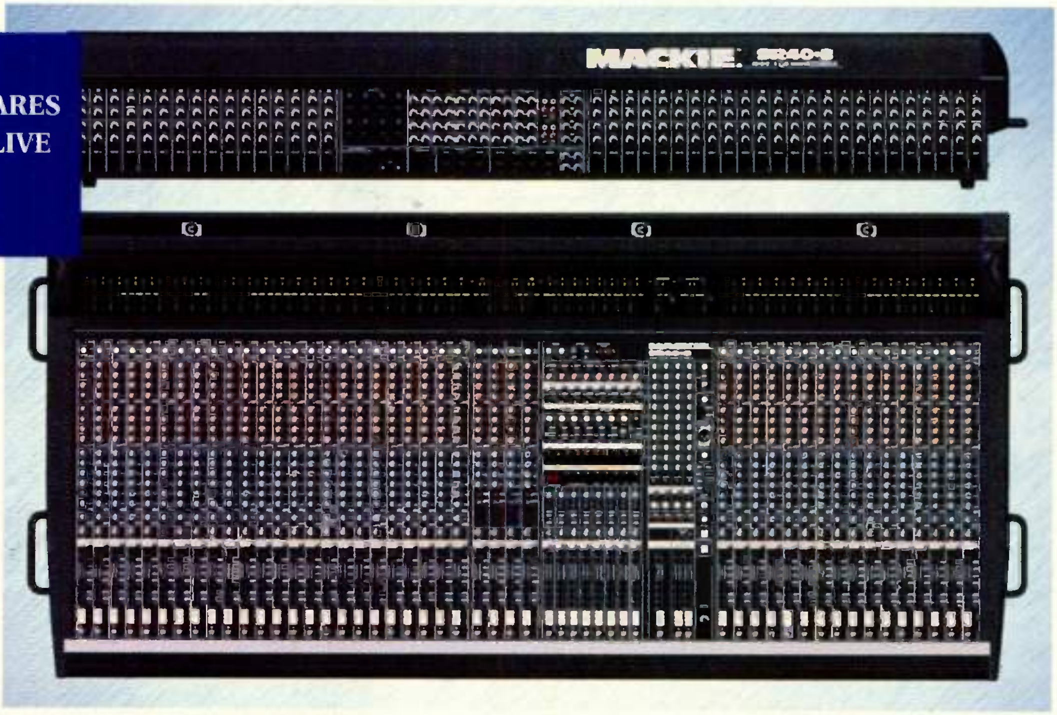
Line 6's, (a division of Fast Forward Designs, Inc.) new AxSys 212 digital guitar amplifier is designed to emulate the sounds of the most popular classic tube and solid-state amps. The AxSys 212 features a dual-DSP preamp section that models not only a "tube sound," but the entire tube circuitry including the amplifier. The amp features a "rack-mount" digital effects processor built directly into the 212's architecture, as well as a 100-watt stereo (50-watt RMS per channel) amp with dual 12-inch custom-designed Eminence speakers. Feature highlights include 128 preset/128 user locations and 17 simultaneous 24-bit digital effects with stereo processing. For more details, contact Line 6, 11260 Playa Court, Culver City, CA 90230. Tel: 310-390-5956. Circle EQ free lit. #127.

Line 6 AxSys 212

MACKIE SR40•8 CONSOLE

FIRST LOOK: THE CONSOLE KING PREPARES HIS REIGN OVER THE LIVE SOUND MARKET

BY STEVE LA CERRA



TOUR BUS: Mackie hopes the 40•8 live mixer will catch on like its popular studio 8•bus models.

EVERYBODY IN THE audio industry knows what Mackie has done for the project recording studio market with its 8•Bus Series consoles. Now Mackie is ready to take on the touring sound-reinforcement sector with the introduction of the SR40•8. The SR40•8 is a large-format console with mute automation, a centrally located master section, and features normally found on boards in a much higher price range.

Each input channel of the SR40•8 has an XLR mic input and balanced 1/4-inch TRS jacks for line input, direct output, and insert (send and return on separate connectors). The desk features 40 such inputs — each with a considerable amount of control on the channel strip. There is a trim control for input level, eight aux sends, a phase reverse button, and phantom power with an LED status indicator. All eight auxiliaries are switchable for PRE or POST operation. When auxes one through four are set to PRE they are prefader and pre-EQ; in POST they are postfader and post-EQ. Auxes five through eight can also be switched PRE or POST, but they are slightly different in that they are always post-EQ. All auxes are post-mute switch. Input channels and output channels may be soloed either PFL or AFL, selectable from the front panel.

A 4-band EQ occupies the center of the channel strip with 12 kHz high- and 80 Hz low-shelf bands, high-mid (sweepable from 500 Hz to 15 kHz) and low-mid (sweepable from 45 Hz to 3 kHz) bands. The EQ section also has a 12 dB/octave high-pass filter, adjustable from 30 to 800 Hz. Both the filter and the EQ have in/out switches. Mackie has endowed the SR40•8 with LCR assignment and provides separate assign buttons (and rear-panel balanced XLR outputs) for left, right, and center audio channels. While the L-R signal is fed from the output of the panpot, the center assign signal is derived before the panpot. Although the left, center, and right audio signals are controlled by separate faders, the left and right faders can be linked with a pushbutton, allowing the right fader to control the left and right signal paths. The panpot, in conjunction with the four switches next to the fader can also assign an input to any of the eight audio subgroups. Located near the bottom of the channel fader is a solo button with an LED indicator. A mute switch and its associated LED are located towards the top of the 100 mm channel fader.

Instead of giving you the typical stripped-down aux return section, Mackie has built in four stereo returns that are almost the same as the input channels. Rear-panel 1/4-inch connectors accept balanced or unbalanced line level input signals. Each return has a trim control and 4-band EQ section with 12 kHz high- and 80 Hz low-shelf sections and fixed high-mid (3.5 kHz) and low-mid (800 Hz) sections. As on the input channel, there is an EQ in/out switch on the return. One cool thing about the aux returns is that they also include sends to auxes one through eight (so you can dump one effect into the next) and bus assignment so that you can group effects with instruments.

In addition to these returns, the SR40•8 also has another four stereo returns (with mute, solo, and level controls) and a pair of stereo tape returns. Mackie has clearly done their homework on the tape returns. Connectors are RCA (if you need 1/4-inch you can use an input channel), and Mackie has also brought two of the four matrix outputs to the RCA "tape output" jacks for easy recording of shows. The matrix outputs also appear on XLR connectors. A series of level knobs allow you to mix any of the eight subgroups, left, right, or center bus and an external input signal to any of the four matrix outputs (each matrix has its own external input). In addition to mute and solo buttons, each matrix also has a master level control.

WRH

The RØDE™ to Recording Success Starts Here...

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

The RØDE™ has all the special stuff:

- **Dual Gradient Transducers** with **Large Diaphragm** and **Gold Plated Membrane** to warmly receive and translate the full body of the performance
- Internal **Gold Plated Connections,** insuring warmth and precise signal transitions for years to come
- **Transformer-less** low-noise circuitry
- **Switchable Filter** enabling you to change the low frequency response
- **Switchable Pad** enabling you to handle high gain
- **Switchable Pattern** providing cardioid or omni patterns
- **High SPL** *(sound pressure level)* allowing it to work cleanly for screaming vocals or instruments, or even soft spoken word
- It even comes with a **Shock Mount, Flight Case,** and **Pop Filter.**

The RØDE™ large Diaphragm Condenser Mic is hand-assembled in Australia. In the tradition of the great microphones, it's designed to furnish outstanding, vintage-flavored vocal or instrumentation miking—at a truly untraditional, breakthrough price . . . **$749.00.**

Step on the road to recording success by seeking out your nearest EVENT Electronics dealer. Listen to the NT2 and hear the difference a great mic can make.

RØDE is a trademark of Freedman Electronics.

CIRCLE 36 ON FREE INFO CARD

EVENT
ELECTRONICS INC

P.O. Box 4189
Santa Barbara CA 93140-4189
voice 805-962-6926
fax 805-962-3830

One of the more unusual features of the SR40•8 is the "air" EQ control found on the audio subgroups, which has a turnover frequency of 16 kHz. Each subgroup has a 100 mm fader, mute, solo, and panpot controls. Like the input channels, the subs can be separately assigned to the L-R bus or the center bus, so you could easily set up a sub for vocal-fill purposes. A 'flip' button above each aux send master swaps the group fader for the aux send master of the same number, enabling you to use the straight faders for monitor sends.

Something that is bound to attract busy engineers is the SR40•8's built-in Ultra Mute automation. Ultra Mute features two modes of operation, the first of which is snapshot mode. Designed primarily for applications requiring script-style scene automation (such as theater and industrials), this mode can memorize 100 pictures of the SR40•8's mute status for the input channels, subgroups, and the four matrix outputs. Group mute, likely to be preferred for music production, allows you to group inputs for simultaneous muting at the punch of a single button.

You could (for example) have the drums assigned to group mute five. At any time in the show, pressing that group mute button will silence the drum channels. Engaging a group mute will not disturb the status of any other channel mutes and an input channel can be a member of more than one group. Internal memory for mutes is nonvolatile and can be loaded (in or out) via MIDI or RS232 ports.

It's evident that Mackie has built the SR40•8 for serious sound-reinforcement applications. Front- and rear-panel jacks accommodate a talkback microphone, which can be assigned to any of the four matrix outputs, the L-R outs, or auxiliary sends one through eight. And the SR40•8 has the unique ability to interface your talkback mic and standard headphones with a Clear-Com system. A meter bridge (switchable to show AFL or PFL) is standard on the desk; a dimmer controls brightness of both the meter bridge LEDs and the Littlites. The power supply for the SR40•8 is an outboard unit and two separate supplies may be simultaneously connected to a single console. When both supplies are connected, they work at half capacity and in the event that one should fail, the other will continue working (at full capacity) for uninterrupted service. The SR40•8 also includes a headphone jack with level control, solo level control, and four handles for moving the desk. Suggested retail price is $8999, and the SR40•8 is expected to begin shipping in mid-summer '96.

For more information, contact Mackie at 16220 Wood-Red Road, Woodinville, WA 98072. Tel: 800-898-3211. Circle EQ free lit. #128.

YORKVILLE 300K

STEREO KEYBOARD/MIXER AMP

150 WATTS PER CHANNEL!

RCF TWEETERS

10" WOOFERS

VERSATILITY & GREAT SOUND TOGETHER

FEATURES...

- Built-in 6 channel mixer for keyboards, mics & CD/tape
  - 3 stereo 1/4" inputs
  - 2 mono XLR mic inputs
  - 1 stereo tape/CD input
- EQ and 2 effects sends for each channel
- L/R balanced XLR and 1/4" outputs
- RCA outputs for recording
- 20-20kHz frequency response

2 THUMBS UP!

- *"...by far the most versatile keyboard amplifier around."*
- *"My ears were delighted to hear such a clean tight sound."*
- *"The patches from my SY and Proteus really come alive through the 300K."*
- *"The low end was deep and tight, the high end was smooth and non-brittle,"*
- *"...the kind of warranty that makes other manufacturers nervous."*

– Paul Errico The Music Paper

UNBEATABLE 2 YEAR, TRANSFERABLE, "EVEN IF YOU BREAK IT" WARRANTY

WITH MODELS FROM 50 TO 300 WATTS, YOUR YORKVILLE DEALER HAS THE RIGHT KEYBOARD/MIXER AMP FOR YOU.

IN THE USA
Yorkville Sound Inc.
4625 Witmer Industrial Estate
Niagara Falls, N.Y. 14305

Yorkville

AMPS FOR THE 90's

IN CANADA
Yorkville Sound Ltd.
550 Granite Court
Pickering, ONT. L1W 3Y8

CIRCLE 78 ON FREE INFO CARD

crown
STUDIO Reference I

DEADLY ACCURATE. BRUTALLY HONEST. THE BEST STUDIO AMPLIFIERS YOU'VE EVER HEARD.

What you hear is what you get. A rule to live and die by in the studio. A rule too many other amplifiers tend to forget. That's why we're introducing the new Studio Reference Series.

Our Studio Reference 1 and 2 are simply the most sonically accurate amplifiers you've ever heard. No added coloration to skew your mix. Excessive headroom to handle even the most dramatic transients. Incredible damping for a tight, defined low-end. And noise that's so low, it's hard to measure and impossible to hear.

In short, the Studio References are the best amplifiers for super-critical evaluation in the studio or home. And, they're backed with Crown's exclusive Three Year Full No-Fault Warranty.

If you're ready to audition the most accurate studio amp you've ever heard, contact your Crown representative or call us at 1-800-342-6939 ext. 35.

crown
Guaranteed Excellence

CIRCLE 19 ON FREE INFO CARD

WRH

ALLEN AND HEATH GL2000 CONSOLE

FIRST LOOK: A&H'S NEW MIXER DOES DOUBLE DUTY AT FOH AND MONITORS

BY STEVE LA CERRA

TWO-IN-ONE: The versatile A&H GL2000 is expandable, and can handle both FOH and monitor duties.

HOW WOULD YOU like to have a mixing console that could be used to mix front of house, but, if needed, could be reconfigured to mix monitors without sacrificing any of the conveniences that you expect from a monitor board? Well, have a look at the Allen and Heath GL2000. The latest offering from A&H is designed to do exactly that, and can even be expanded when you are ready to run more input channels. The GL2000 comes in 12-, 16-, and 24-input frame sizes with an internal power supply and the option to link to any of Allen and Heath's consoles via their proprietary SYS-LINK interface.

Each of the GL2000's input channels has the features that you have come to expect as standard on a sound-reinforcement console. A 4-band EQ includes a 12 kHz high-frequency shelf, 500 Hz–15 kHz hi-mid sweep, 95 Hz–1 kHz low-mid sweep, and 80 Hz low-frequency shelf, all capable of 15 dB cut or boost. Six assign buttons along with a panpot route the input channel to busses one through four or the L-R master.

There is a 100 Hz low-frequency rolloff switch, a PFL button (with yellow LED), mute switch (with red LED), 100 mm fader, 1/4-inch TRS insert (tip = send, ring = return), individual phantom power switch (48 volts DC), polarity reverse, six auxiliary sends (that can be switched pre- or postfader in sets of one through four or five/six), an EQ in/out switch, balanced mic and line inputs with a mic/line switch, and a trim control with a 50 dB range(!). Oh yeah — and don't forget the four-segment (three yellow, one red) LED input meter that sits right next to the channel fader where you can easily see it. Engineers that like to return their effects to input channels will be happy to know that the desk's XLR "mic" inputs will accept a line-level signal.

Those were the things that you expected to find on this console, but there are a lot of things you didn't expect. First of all, any of the three frame sizes actually has another eight inputs above the number of channels. Two of these are stereo auxiliary returns with a short-throw, straight fader, HF and LF shelf EQ, PFL (with LED), and assignment to the L-R master and two of the four subs (i.e., one stereo return can assign to subs 1 and 2, and the other can assign to subs 3 and 4). Assignment to the subs makes it handy to group a reverb with the drum kit mix and have control over the whole package.

The other four channels come from two stereo inputs that have just about all of the features of a regular mono input channel (the main difference being that the mid-bands of EQ are fixed at 250 Hz and 2.5 kHz). These stereo inputs kind of share the same space as the last two mono input channels, but you have your choice as to which signal gets the EQ, assign, and access to aux sends one through six. It works like this: there is a mic/line switch on the channel that selects which signal is routed through the main channel path. When the switch is set to mic, the mic input on that channel gets the bells and whistles and the stereo line input can be dumped into the L-R mix via the "Line to L-R" switch (level is controlled with the "Line Lev" pot). If the switch is set to line, then the stereo line input gets the main channel path (with EQ, sends etc.) and the mic can be routed to the L-R mix via the "Line to L-R" switch. While this may seem a bit odd, it will make more sense when we get to the monitor mixing mode of the console.

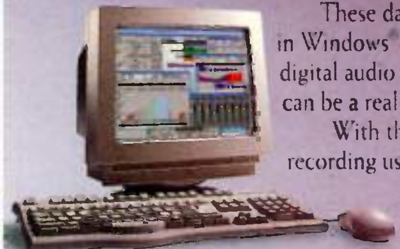
If you have ever tried to use a front-of-house console to mix monitors, you know what a pain it can be even when you locate the desk at the monitor mix position. Allen and Heath doesn't want you to have that kind of aggravation, so they give you a set of switches that turns the GL2000 into a fully functioning monitor board. In the GL2000's master section are three recessed buttons that swap the aux send master for the corresponding group output (auxes five and six correspond to the L-R master faders).

Now the fader swap isn't so special, but what is special is that engaging these buttons also feeds the auxes to the group inserts, output meters, AFL controls, and balanced XLR outputs. So you can run the GL2000 as a six-bus monitor console. The inserts are particularly useful since you'll probably need to patch

WRH

New version 3.0 included!
Featuring Sound Card and Digital Audio and WaveLab Lite
CUBASE
FOR WINDOWS
CUBASE Score
FOR WINDOWS
NEW VERSION 3.0
CUBASE AUDIO 3.0 XT
THE INTEGRA
AND PU
Steinberg

THE LINE FOR AUDIO STARTS HERE.



These days, MIDI recording is standard in Windows® sequencer software. But integrating digital audio recording into these same applications can be a real blow to your budget. Until now.

With the introduction of the Cubase 3.0 line, professional audio recording using a typical soundcard becomes the *new* standard. Starting with **Cubase 3.0** you get up to 8 stereo tracks of audio, waveform editing, time stretch, pitch shift, vari speed, digital mixdown, Wavelab Lite and much more without squeezing your budget. Plus, with its high resolution printing your scoring will never look more professional. At $349 even the price is better than the competitions.

But that's only the beginning. **Cubase Score 3.0** is the next step. With all the Cubase 3.0 features included, Score 3.0 also integrates automatic guitar tablature and chord analysis, percussion scoring, and 60 staves of notation. The page layout mode gives you professional scoring and desktop publishing and proves that $549 never went so far.

If you want even more audio, and want to use other hard disk recording systems such as Digidesign's™ Session8™ and Audiomedia III™ or Yamaha's™ CBX D3/D5™, look no further than **Cubase Audio 3.0 XT** – the top of the line. For only $799 you really can have it all.

Cubase 3.0. is available for Mac OS and Windows making digital audio a standard for everyone.

To find out more call your local dealer or contact Steinberg Customer Service at (818)993-4091 for a copy of our CD ROM demo ($5 includes shipping and handling). And see why the line for audio begins and ends with Steinberg.

Steinberg
NORTH AMERICA

COME SEE US AT NAMM BOOTH #1515

Steinberg North America, 9312 Deering Avenue, Chatsworth, CA 91311-5857 USA Phone (818)993-4091 Fax (818)701-7452 Fax On Demand (800)888-7510

All trademarks are registered by their respective companies.

To download a demo program visit our web site at http://www.steinberg-us.com, AOL: Keyword Steinberg, or CompuServe: GO MIDICVEN

CIRCLE 74 ON FREE INFO CARD

graphic EQs and compressors into each mix bus.

Remember those two stereo input channels? When the main channel source for the second stereo input is set to line, a green LED appears next to the mic trim control. This LED is telling you that this mic is ready to be used for talkback to monitors. Another set of three buttons assigns this talkback channel to any of the six monitor mixes, making on-stage communications a breeze — without patching. As the monitor engineer you'll need to hear these mixes, so the GL2000's mono output will feed your cue wedge any AFL or PFL signal that you select. Smart.

Each channel of the master section has an individual, vertically mounted circuit board (as do the input channels) for easy servicing. In addition to the four bus and L-R master faders, there are rotary send and return faders for a 2-track machine (rear-panel connectors are RCA). Output from the 2-track machine can be routed to the headphone output (with level control), as can the main L-R output. Front-panel metering includes a three-color, 12-segment LED display for the L-R masters and six four-segment LED meters that show level for the four bus outs and also offer redundant metering for the L-R bus. In monitor mode these meters show the levels of the six auxiliary outputs. The four group faders have panpots, L-R assign buttons, and AFL buttons and there is also a rotary-fader mono output that could be used to feed a subwoofer amp or maybe a center vocal-fill cluster.

Allen and Heath has certainly left room for growth in the GL2000, providing several interesting options. The console can be fitted with the company's SYS-LINK circuit card, which allows the desk to be linked with just about any console in A&H's line including the GL3000, GL4-840ST, GR1, and GL2 mixers. Linking two consoles requires connection of a cable between rear-panel 25-pin 'D' connectors and can include any or all of the aux busses, group busses, L-R bus, and AFL/PFL switching. There is also an option/modification for the aux master outputs and the mono output that changes those circuits from unbalanced to balanced and simply requires installation of a balanced driver output IC.

For those who plan to truck their GL2000 around from gig to gig, A&H offers an industrial-strength flight case for the desk to protect it from road abuse. A meter bridge is available for all three frame sizes. Availability is immediate and retail prices are as follows: GL2000-412, $2495 (meter bridge is $499.95); GL2000-416, $2995 (meter bridge is $529); GL2000-424, $3995 (meter bridge is $549); SYS-LINK option: $349.

For more information, contact Allen & Heath at 8760 S. Sandy Parkway, Sandy, UT 84070. Tel: 801-568-7660. Circle EQ free lit. #129.

JBL EON Keyboard15

First Look: JBL adds a new addition to its popular portable sound system

By Steve La Cerra

YOU MIGHT ALREADY be familiar with JBL's EON concept — a series of compactly designed sound-reinforcement products that are as easy to use as they are to move. Now JBL has taken the EON concept a step further by introducing the EON Keyboard15. As the name suggests, the EON Keyboard15 was designed for amplification of synths, samplers, and drum machines. Although the EON Keyboard15 can be used as a stage monitor, the unit is powerful enough to function as the main amplification for a keyboard player's rig.

The Keyboard15 is internally biamped with a 130-watt power amplifier for the 15-inch woofer and a 50-watt amp for the high-frequency driver. While the power rating of the internal amplifiers may not seem like a lot, remember that this is a biamped system, so it is much more efficient than a full-range system would be, given the same amount of power. The woofer uses Neodymium magnets and JBL's Differential Drive motor structure that, you'll be happy to know, keeps weight down while at the same time maintaining the driver's ability to withstand heat.

TAKE IT WITH YOU: JBL EON Keyboard15

Combined with the Keyboard15's polypropylene cabinet, the construction of the woofer helps bring in the overall weight at an easy-to-move 40 pounds. Whereas a lot of keyboard amps have a Piezo driver for the high frequencies, the newest member of the EON family uses a compression driver with a pure titanium diaphragm. JBL reports that the pure titanium driver allows the system to play loud while still providing clean audio.

The Keyboard15 has been designed so that it can be set either upright like a conventional PA cabinet or tilted back for use as a floor monitor. The front baffle of the cabinet is formed from die-cast aluminum and dissipates heat from both the drivers and the power amplifiers. On the rear panel are two 1/4-inch (instrument-level) inputs, as well as an XLR mic input, each with individual level controls — so you won't need an external mixer. Also provided are 4-band EQ, an effects loop, headphone jack, and line output. List price of the JBL EON Keyboard15 is under $800.

For more information, contact JBL at 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-894-8850. Circle EQ free lit. #130.

adat
ALESIS
0. 19. 38. 95
COUNTER
METERS
INPUT SELECT

“The Next Level In Sonic Quality”
“Vastly Improved Transport”
“Amazing Technology”

“In every case, the XT demonstrated a noticeable improvement in sonic detail over the original ADAT.”
George Petersen, Editor,
MIX Magazine

“The XT's improvements in sound quality, transport speed, and lock-up time alone are worth the price. I believe that the XT makes recordists an offer they just can't refuse.”
Michael Molenda, Editor,
Electronic Musician Magazine

The Experts On

adat xt

“The XT has new A/D and D/A converters, and the improvement in sound quality is unmistakable. If you are looking to take your ADAT-based studio to the next level in sonic quality, features and raw speed, the ADAT-XT lives up to its hype.”
Loren Alldrin, Reviewer,
Pro Audio Review Magazine

“When you use the machine, the first thing you notice is the vastly improved transport.”
Paul J. Stamler, Reviewer,
Recording Magazine

“This review of the ADAT-XT can be summed up in three short lines: I used it. I loved it. I'll take it.”
Greg Rule, Assistant Editor,
Keyboard Magazine

“The bottom line, as Casey Stengel used to say: ‘Amazing, amazing, amazing.’ That is, amazing technology, amazing functionality, and amazing price.”
Howard Massey, Technology Editor,
Musician Magazine

CIRCLE 04 ON FREE INFO CARD

For more information on the ADAT-XT, see your Authorized Alesis Dealer or call 310-841-2272
® Alesis and ADAT are registered trademarks, ADAT-XT is a trademark of Alesis Corporation

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016 310-841-2272 alecorp@alesis1.usa.com

ALESIS

SAMSON SYNTH 6 WIRELESS SYSTEM

FIRST LOOK: SAMSON INTRODUCES AN "INTELLIGENT" WIRELESS SYSTEM

BY STEVE LA CERRA

THE NEW SAMSON Synth Series 6 computer-controlled UHF-synthesized wireless system is designed for professional musicians, high-end theater, and systems-contracting applications. The system consists of two different models operating in separate frequency ranges, each with 95 channels. Frequency Range 1 is from 794.125–805.875 MHz, while Frequency Range 2 (a companion set of frequencies known as "X Frequencies") operates from 782.125–791.875 MHz.

The Synth Series 6 system receiver comes in a dual-receiver format and is housed in a 1U rackmount chassis. Each of the receivers in a unit has separate balanced and unbalanced output connectors, but Samson has cleverly included a "Mix" switch that can combine the outputs from both channels into a single audio signal, enabling you to more easily manage the number of audio channels fed from the stage. These audio outputs can be switched between –20 dBm and –60 dBm level, allowing them to interface with either line-level or mic-level inputs.

A three-position antenna attenuator adjusts sensitivity between 0 dB, –10 dB, and –20 dB (all of these switches are concealed under a protective panel on the front of the unit). Automatic voltage-sensing circuitry detects AC supply from 100 to 240 volts, so you can use the Series 6 worldwide without having to open up the box and make adjustments. Other receiver features include a back-lit LCD display and dbx noise reduction.

Samson's new system offers unique features such as remote management and control capability via a PC running Windows '95 and the company's "WSM" (Wireless System Manager) software. Up to 16 receivers can be remotely controlled from FOH mix positions hundreds of feet away. WSM allows an engineer (using a mouse and computer keyboard) to control a variety of receiver functions such as channel/frequency, mute, tone, squelch, and RX (receiver) Title to identify individual systems on stage.

Synth Series 6 is an intelligent wireless system that has the ability to autoscan for existing frequencies, providing a window or "look" at interference in the area, and can import an optional channel plan for different sites. Touring sound companies will love that last feature: channel plans could be written for different show locations, depending on how crowded certain frequencies might be in a particular city. Remote input and output capability is provided via a mini-DIN connector that connects the unit to your PC.

One of the important features of the Synth Series 6 is that it can be operated in two different RF power modes: 1 mW and 10 mW. At the lower 1 mW power output rating — recommended for fixed installations and requiring at least two powered antennas strategically located within the stage perimeter — a total of 96 systems may be run simultaneously with a maximum operating range of a 200-foot diameter (100-foot radius). With additional powered antennas, that range can be extended to a 600-foot diameter (300-foot radius). In the higher-powered 10 mW mode, up to 19 systems can be used simultaneously with a maximum line-of-sight range of a 540-foot diameter (270-foot radius).

There are two types of Synth 6 transmitters: handheld and beltpack-type. Both types are available in two models, each with 95 channels operating in two separate frequency ranges: 794.125 to 807.875 MHz and 782.125 to 793.875 MHz (the "X Frequencies"). The transmitters all use two AA batteries for 3-volt operation due to the increased availability and lower user cost in the AA format. Battery life is 15 hours at 1 mW operation and 10 hours at 10 mW operation. A battery-life LED lights one hour before the units cease to function, so you'll have plenty of time to install a new battery before you have an onstage disaster.

Controls on the handheld transmitter include an external Audio switch and a two-color LED power indicator (green for power "on," red for "low battery"). Internal controls mounted inside the battery compartment include a power On/Off switch, Group and Channel switches, RF power (10 mW or 1 mW), microphone level pot, and an extremely handy "Unavailable Channel" LED that lights when you select a channel not included in the programmed channel plan.

The beltpack transmitters also feature a locking six-pin connector for headset and lavalier mics and an ABS plastic body with a rotatable antenna and belt clip. For the most part, the beltpack transmitters have the same indicator and switching functions as the handheld transmitters with one major exception: the beltpack features an input select switch for either mic or instrument and corresponding level controls. So you can have a single Synth Series 6 beltpack that may be put into use for either a guitar or bass or microphone. All transmitters include built-in antennas. Samson expects to begin shipping the Synth Series 6 wireless system towards the end of the year.

For more information, contact Samson Technologies, P.O. Box 9068 Hicksville, NY 11802. Tel: 516-364-2244. Circle EQ free lit. #142.

FIRST LOOK: SONY WD-880A UHF CHANNEL MULTIPLIER

The Sony WD-880A UHF spectrum divider is designed to work with the company's well-known WL-800 Series wireless components. By adding a WD-880A to a new or existing multichannel wireless system, the system can accommodate up to 42 channels of simultaneous operation. On the WD-880A's rear panel are six diversity distribution output connectors for feeding RF signals to six receiving systems, each of which can operate up to seven channels in the 800 MHz UHF band. RF signals are fed to the appropriate receiver via the WD-880A's bandpass filters. For more info, contact Sony 3 Paragon Dr., Montvale, NJ 07645. Circle EQ free lit. #142.

WRH

FOLIO SX

THE FACTS (& no Bull)

At Soundcraft, designing the mixing consoles people actually want has been a serious business for over 22 years. We've listened to our customers – from budding musicians to world-renowned artists and sound companies – and we've built their wish-lists into our mixers. We don't hype our new features and we don't go in for gimmicks. When you listen to SX you'll realize we listened to you.

NO HYPE NO GIMMICKS NO BULL.

FOLIO SX is a powerful, multipurpose mixer with DAT quality sound, housed in a freestanding frame with carry handle.

$769.95

Suggested Retail in USA

SPIRIT FOLIO
SX

- **20 inputs** (including 4 stereo channels) as standard, enough for most live and recording situations
- **12 mono inputs with UltraMic™ preamps** giving 60dB of gain range and +22dBu of headroom, allowing any mic or line device to be plugged in.
- **Two sub-buses** allow you to record groups of instruments to multitrack, send them to additional speakers, or sub group to mix. SX also has a dedicated Mono Out.
- **8 Direct Outs switchable pre/post fader,** equally useful when recording in the studio or at a gig.
- **100mm faders** throughout
- **Real British 3-band EQ with swept mid**
- **18dB/Octave High Pass Filter** effectively reduces low end muddiness.
- **3 Auxiliary Sends:** 2 can be pre- or post-fader.
- **Custom-designed consistent controls** give an even spread of control around their sweeps.
- **Surface-mount technology**
- **Rack mount option**

SX's Direct Outs on the first 8 inputs are front panel switchable pre-fader for live track laying, or post-fader so you can "massage" recording levels in the studio.

MONO INPUTS

UltraMic™ padless preamp gives 60dB of gain range with 22dBu of headroom

Insert point for effects

Direct Out on channels 1 – 8

100Hz steep slope High Pass Filter

3-Band "British" EQ with swept mid

3 Auxiliaries configurable
2 x Pre/1 x Post or
1 x Pre/2 x Post

Channel "ON" switch

MIX/SUB routing switch

Full 100mm fader

PFL

STEREO INPUTS

13, 14, 17 & 18: simple phono inputs with Level and MIX/SUB routing

15, 16, 19 & 20: Balanced jack inputs with Gain, 2 band EQ, Aux levels, Channel "ON", MIX/SUB routing, 100mm fader and PFL

APPLICATIONS

LIVE SOUND
Bands, small venues, conferences, schools, places of worship

STUDIO RECORDING
Digital and analogue multitrack (4 & 8 track), small or home studios, pre-production video post production

SUBMIXING

LOCATION SOUND

TYPICAL SPECIFICATIONS

Mic EIN	-129dBu
Crosstalk (1kHz):	
Channel Mute	<95dB
Fader Cutoff	<90dB
Frequency Response (20Hz to 30kHz)	<1dB
THD	<0.006%

SURFACE MOUNT TECHNOLOGY BREAKS THE FEATURES/PRICE BARRIER

As one of the world's largest mixing console manufacturers, Soundcraft has invested in the most advanced production systems available. Leading edge circuit construction using Surface Mount double-sided glass epoxy PCBs means lower manufacturing costs without any downside. The result: much more mixer for your dollar.

http://www.spirit-by-soundcraft.co.uk

Spirit by Soundcraft™ Inc.
11820 Kemper Road
Auburn, CA. 95603
Tel: (916) 888 0488
Fax: (916) 888 0480

SPIRIT
By Soundcraft

H A Harman International Company

CIRCLE 61 ON FREE INFO CARD

CREST AUDIO CENTURY VX MIXING CONSOLE

IF YOUR STYLE has been cramped by the capabilities of your current mixing console, then it is time to take a good look at the new Crest Century Vx console. This is a serious console for those who must meet the high expectations of more sophisticated productions. Although the Vx is priced in the midrange of mixing consoles, it successfully incorporates much of the routing and control available at the upper end of the mixer market. If you need exacting control over signals routed to a number of loudspeakers, individual mixes for backstage, balcony fill, or delay stacks, and facilities to help you stay on top of complex stage events, the Vx may be your control center.

The Vx does not simply add more lights and switches to the other Century Series mixers. Its control surface is full of very practical facilities focused on the demanding needs of live performance. The versatile routing of this console remains useful in every mode due to the liberal use of LED status indicators. In addition to providing individual routing for each subgroup, left, right, and mono master, there are eight VCA groups and four muting groups. The mute switches on the VCA groups also mute the inputs assigned to that VCA, thereby adding another level of mute grouping. VCA groups are an essential part of a console that offers left/center/right panning and a 12-by-8 output matrix because they give the operator the flexibility to control the level of a group of inputs without affecting the audio signal routing.

One of the best features of VCA grouping is the ability to provide individual mixes, such as band/reverb and effects in the left/right system and vocals in the center cluster, and yet have a master level control that maintains the balance between voice and effects without having to share any of the audio signal path. Inputs on the Vx can be assigned to any or all of the eight VCA groups, and thereby be included in multiple groups as the production demands. The brightness of an LED located above each fader indicates the current VCA level. This is especially important when inputs are assigned to more than one group. The LED changes from green to red when the total VCA gain (+18 dB) has been reached, warning the operator that the faders cannot raise the level any further. This gain limitation (albeit at different absolute levels) is common to all VCA controls, but relatively few let you know so clearly. The VCA groups conveniently include unity indications for fast resetting of levels when regrouping on the fly. I did notice that there was about a ±1 dB error between different VCA controls relative to the fader legend and equal settings.

The inputs provide an equally high level of control with: phantom power; 15 dB pad; line/microphone switch; up to 70 dB of gain from a high-quality microphone preamp; a variable high-pass filter [see fig. 1], parametric equalization; eight auxiliary sends; channel

ROAD TEST

MANUFACTURER: Crest Audio Inc., 100 Eisenhower Drive, Paramus, NJ, 07652 Tel: 201-909-8700

APPLICATIONS: Sound reinforcement and live theater mixing console for demanding productions.

SUMMARY: A versatile mixing console capable of handling diverse input signals and complex output routing requirements.

STRENGTHS: Easy-to-see control status; comprehensive signal routing, logical control layout, clean audio path, compact size, solidly constructed.

WEAKNESSES: May overwhelm less sophisticated users; small assignment buttons; surprisingly heavy console for its size.

PRICE: $31,700, 32-channel version (44-channel frame); $38,100, 40-channel; $48,700, 52-channel

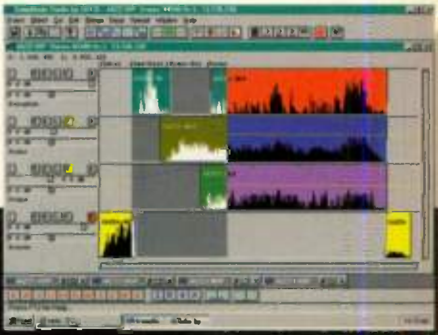
EQ FREE LIT. #: 131

BY WADE MCGREGOR

"We Recommend CardD"

SAW PLUS™
Innovative Quality Software

SOUND FORGE™
Sonic Foundry



SAMPLITUDE STUDIO™
SEK'D

CAKEWALK PRO AUDIO™
Cakewalk Software

LOGIC AUDIO™
Emagic

00: 00: 52: 11. 17

CUBASE AUDIO™
Steinberg

At Digital Audio Labs, we're very proud of the company we keep. Our ***CardD***™ family of PC recording cards are recommended by the top Windows audio and MIDI software companies for good reason. The ***CardDplus***™ and *Digital Only* ***CardD*** offer the performance and compatibility that make these programs truly shine.

Now the ***CardD*** supports Windows 3.1, '95, *and NT,* allowing it to run with even more of your favorite editing, multitrack, and MIDI/Audio programs. And, since it's a ***CardD***, you can rest assured that the audio quality will always be there.

So, when considering a PC-based hard disk recording system, make the choice that maximizes your software choices, audio quality, and value. Choose the ***CardD*** from Digital Audio Labs.

Digital AUDIO LABS

13705 26th Ave. N. S-102 Plymouth, MN 55441
612/559.9098 Fax 612/559.0124
dalinfo@digitalaudio.com

©1996 Digital Audio Labs

CIRCLE 20 ON FREE INFO CARD

WRH

insert bypass switch; and multimode solo. The 4-band equalization includes variable high- and low-frequency bands that can be switched between peak or shelf filters [see fig. 2], and two overlapping mid-frequency bands that can be switched between high (1.8) and low Q (0.8) [see figs. 3 and 4].

The EQ frequencies are well thought out and offer good selectivity. The high-Q setting is not high enough to notch out a single hot note, but are very useful for such tasks as smoothing out spikes in the overall response or pulling out resonant peaks. The low-Q setting is very good for making changes to instrument timbre and removing mud or boxyness from vocals. There are stereo input modules available in the same individual module width that include both microphone inputs with phantom power and line inputs, although the 3-band equalization lacks the Q and Peak/Shelf switches. In addition, a multi-input module is available that provides four balanced stereo inputs in a single module width.

All of the important switches on the console include an adjacent LED status indicator. This makes for a very colorful console when all the mutes are active and the house lights have been brought down. The auxiliary sends also include indicators (green/off) that show the status of the Aux On/Off switch integrated into each send's level control and also indicate (in red) when the channel mute is active and, therefore, the auxiliary send is also off. This is one of the many features of this console that can be appreciated by an experienced live-sound engineer the very first time in front of the Vx. Solo switches are everywhere on the console and, in addition to a bright SOLO indicator in the master section of the console, the dedicated solo left and right solo meters brighten whenever solo in engaged.

The auxiliary section offers some other handy features, including a global Pre/Post selection switch at each aux master and individual channel send Pre/Post switches mounted inside on a circuit board. Mute buttons at each master enable a single Aux Mute button (located near the Mute Group switches) to mute any or all of the aux sends with a single action. This is ideal for muting the send to effects units at the end of a song — the reverb and echoes will

continued on page 126

MANUFACTURER'S SPECIFICATIONS

Frequency Response: +0.0 dB/–0.5 dB, 20 Hz to 20 kHz
Total Harmonic Distortion: <0.02%
Phase Response: +30 degrees/–20 degrees
Noise: –80 dBu at Mix Buss Output with 20 channels routed
Crosstalk @ 1 kHz: >102 dB with channel muted; >96 dB with fader at full attenuation
Input Impedance: 4 kohm @ balanced microphone input; >10 kohm @ balanced line input; 140 ohm on all balanced outputs
Mic Input Sensitivity: +4 dBu to –62 dBu
Line Input Sensitivity: +12 dBu to –38 dBu
Maximum Balanced Output Level: +28 dBu
Mono Input Equalization: LF: ±15 dB, 40 Hz to 800 Hz in peak or shelf mode; LMF: ±15 dB, 100 Hz to 2 kHz with peak of Q 0.8 or 1.8; HMF: ±15 dB, 400 Hz to 8 kHz with peak of Q 0.8 or 1.8; HF: ±15 dB, 1.5 kHz to 20 kHz in peak or shelf mode

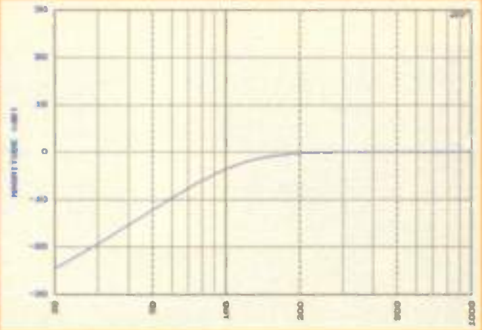


FIGURE 1: Vx highpass filter response with variable frequency control set to 80 Hz.

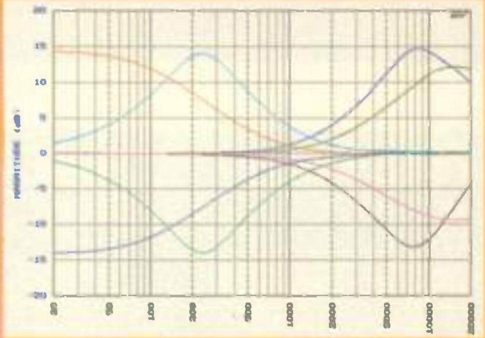


FIGURE 2: High- and low-freq bands at max boost and cut in middle of variable freq range with both shelf and peak filter modes displayed.

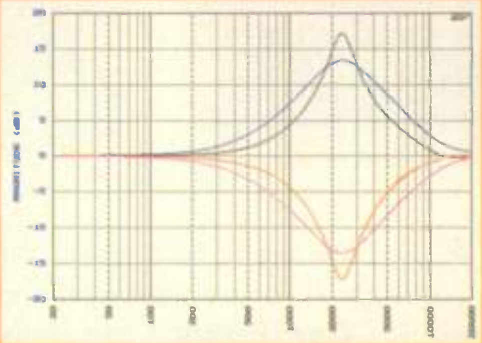


FIGURE 3: High mid-frequency band at maximum boost and cut with both bandwidth (Q) settings shown.

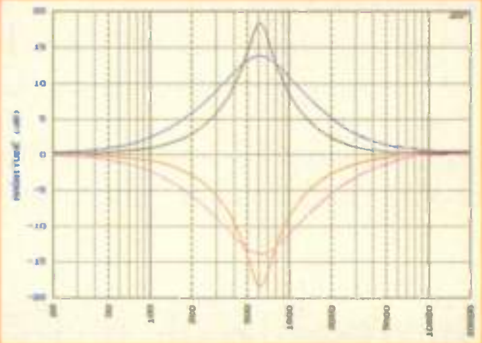


FIGURE 4: Low mid-frequency band at maximum boost and cut with both bandwidth (Q) settings shown.

104 REASONS WHY YOU SHOULD CHOOSE A VEGA WIRELESS SYSTEM

BT2020 TRANSMITTER
VEGA
RF LEVEL
DIVERSITY
AUDIO LEVEL
88
CHANNEL
POWER
R-2020 UHF RECEIVER
VEGA

Reason #1: The wireless you see on specials, award shows and live TV performances is almost always Vega.

Reason #2: Selectable receiver and transmitter provide maximum frequency agility, so you can use it anywhere.

Reason #3: Dual Mode Squelch prevents interference.

Reason #4: Vega's unsurpassed sonic quality and performance is now within your reach.

Reasons #5 - #104: An unprecedented choice of 100 UHF channels with just a few simple clicks.

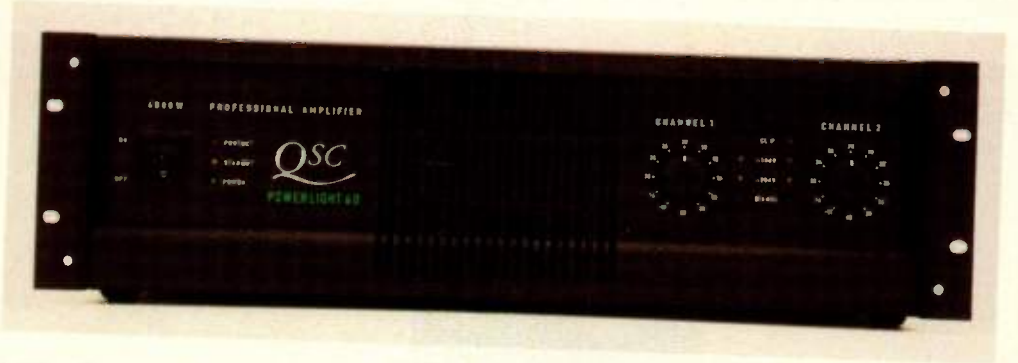
For the dealer nearest you or for a free brochure, call 800/877-1771.
Manufactured in the United States.

U2020
100-Channel UHF Wireless System
VEGA
The Professional's Wireless Since 1960

CIRCLE 94 ON FREE INFO CARD

WRH

QSC POWERLIGHT 4.0 AMPLIFIER



ONE OF THE most stressed components in your sound system is the power amp. It must be able to keep running no matter what goes wrong and sound good doing it. This means that the amp must handle everything from lack of ventilation (your coat fell over the air vent) to shorted loudspeaker cables (the bass player's amp toppled over and crushed the cable) and still be there to finish the show. You may be leaving town tomorrow, but you want to be asked back, right?

QSC has been building robust and reliable amplifiers for many years; its new PowerLight series is the next generation to follow the well-received EX series (for a review of the EX-1600, see *EQ*'s January '92 issue) and adds some significant new features. Although the incredible lightness of power may be the first feature that hits you about this amp, it is the amplifier's ability to smoothly go on with the show that really sets it apart from some of the competition.

LIGHT AND LIVELY

The PowerLight 4.0 is the largest in this new line of amplifiers from QSC. It weighs a mere 30 lbs. (13.6 kg), and yet can deliver 1000 watts per channel into an 8-ohm load and up to 4000 watts into a 4-ohm load in bridged-mono mode. The new power supply is responsible for the power-to-weight ratio of this 3U high by 17.9-inch (45.5 cm) deep amplifier. Gone is the massive transformer of the EX series, replaced by a high-frequency switching power supply that makes use of very tiny high-frequency transformers to convert the power to usable voltages. There are still significantly large capacitors to store energy between cycles of the mains supply, and this accounts for the lack of 60 Hz modulation when driving the PowerLight 4.0 to its limits.

Lightweight power amps previously had a bad reputation when it came to driving power-hungry subwoofers, and this was a particular concern of the PowerLight design team. The result of this focus is a truly massive output capability coupled with the damping and current output to drive large subwoofers and 2-ohm loads with ease. The subbass output of the PowerLight 4.0 is effortless and the amp is hard to drive to the rails even with low impedance loads. The current protection maintains the performance of the amp even as it nears impedances that are close to a dead short.

Short term transients can draw from the 350 V DC reserves stored prior to the 116 kHz switching power supply. In addition to increasing the efficiency of the three-stage DC supply within the PowerLight 4.0, the switching supply (using Insulated Gate Bipolar Transistors) can react very quickly to faults and shut down the amplifier within a few cycles of the supply. Based on the 116 kHz switching rate, the protection mode can turn off the amp before an audio peak reaches its second cycle. The primary reserves of power are stored prior to the switching supply and do not have to be exhausted before the amp can shut down, and this can save your drivers from extinction in the case of catastrophic failure. When the PowerLight 4.0 is switched on and off remotely, the switching power supply stage doesn't require charging the large storage capacitors (that happens when the power is switched on from the front panel). The result is an amp with massive output capability that doesn't dim the lights when you use a remote power-on switch.

This is an amplifier that is made for driving the largest of subwoofers. It drives low-impedance multidriver loads with ease and shows no sign of fatigue even as it punches out peaks in excess of its rated power. I compared the PowerLight 4.0 with high-end studio amplifiers in some of my listening tests and found the transients sounded slightly exaggerated. This had the effect of creating additional attack to percussion sounds. This quality was most noticeable in a critical listening environment, when compar-

ROAD TEST

MANUFACTURER: QSC Audio, 1675 MacArthur Boulevard, Costa Mesa, CA 92626-1468. Tel: 714-754-6175.

APPLICATIONS: Sound reinforcement amplifier for the most demanding applications.

SUMMARY: A well-designed amplifier whose design focuses on making the show go on no matter what, weighs almost nothing, and provides up to 4000 watts of power.

STRENGTHS: Excellent protection circuitry; accurate stepped level controls; serious output power; efficient power supply; weighs only 30 lbs.

WEAKNESSES: Requires significant power service to operate at full power; fan always runs; may put some muscular roadies out of work.

PRICE: $2998

EQ FREE LIT. #: 132

BY WADE MCGREGOR

Hafler
PROFESSIONAL

Brilliant Award Winning *Amplifiers*

Musicians • Broadcasters • Engineers • Producers... It's not a coincidence!

Thank you from your friends at Hafler!

Wally Traugott
Capitol Records

Pat Scholes
Ardent Studios

Mark Egan
Wavetone Records

Wayman Tisdale
Recording Artist

Erick Labson
MCA Music Media

Everybody Loves a Winner!
Hafler
Hafler
Radio World
Cool Stuff Award
Hafler
P1500

Tom Jung
DMP Records

Ronnie Montrose
Recording Artist

Pat Weber
Engineering

Chaton
Recordings

Rusty Milner
Marshall Tucker
Band

P3000 Winner Technical Excellence and Creativity Award

P1500 Winner Radio World Cool Stuff Award National Association of Broadcasters

NEW!

Trans•nova
Hafler

P7000 Trans•nova
D.I.A.B.L.O.

9303/9505 Trans•nova
D.I.A.B.L.O.

HAFLER PROFESSIONAL, A DIVISION OF ROCKFORD CORPORATION • TEMPE, ARIZONA 85281 USA
1-800-366-1619 • INTERNATIONAL FAX 602-967-8132 • IN CANADA, CONTACT CABLE TEK 604-942-1001

CIRCLE 65 ON FREE INFO CARD

MADE IN THE USA

©1995 Rockford Corporation

ing the PowerLight 4.0 with the finest studio amplifiers, especially on solo piano where the forte passages were slightly harsh. However, the sound of this amp is very good when compared to other high-efficiency, high-power amplifiers in its power class.

CARRY PROTECTION

Long-term abuse (overdriving) or equipment-failure modes (shorted cables, melted voice coils, or DC at the output) are gracefully managed by the protection circuitry. This circuitry reduces the input level when the output devices are nearing their limits of heat dissipation or excessive long-term power is demanded from the AC supply. In operation, this protection reduces the output level but sounds better than pounding a conventional protection limiter and restores full power in very short order due to the efficient heat pipe attached to the output devices.

The aluminum extrusion heat sink has sufficient mass to prevent the unit from stuttering in and out of thermal protection as it reaches its limits. The variable speed fan is controlled by the thermal monitoring inside the unit. The fans run at low speed even at idle, thus making this unit inappropriate for applications where such noise would be audible, for example, small theaters and control rooms. However, these are unlikely places for this amount of power.

This new generation of power supply technology has not been added at the expense of the best features of previous QSC amps. The precise input attenuators, clear level and mode indicators, and solid construction remain. This is a very lightweight amplifier, but the chassis is still well-constructed from steel (rack ears and bottom pan) and aluminum. The amp includes mounting attachments at the rear for touring rack installation. Frequency response is ruler flat through the audio band with a gentle roll-off above the audio range (–3 dB at 60 kHz) to reduce RF noise. The noise floor is over 105 dB below the full output of the amp. Even in listening situations where only a few watts were required from the PowerLight 4.0, noise was not a problem, and it was completely free of hum or high-frequency artifacts from the power supply.

WELL CONNECTED

A range of input connectors are offered on the rear panel: Neutrik Combo XLR/phone jacks and screw terminals. The output connectors are the classic 5-way binding post with a touch-proof collar (after all, this amp can develop potentially lethal output voltages). There is also a set of screw terminals that can be connected to a switch for turning the unit on/off remotely. The 10-gauge power cable on the review unit was appropriately massive and terminated in a 30 A plug. Any amplifier of this caliber is not intended for domestic AC outlets. The PowerLight 4.0 can draw as much as 83 amps at peak power (with a 2-ohm load, but more typically 19 amps at 1/3 power into 8 ohms) and must be

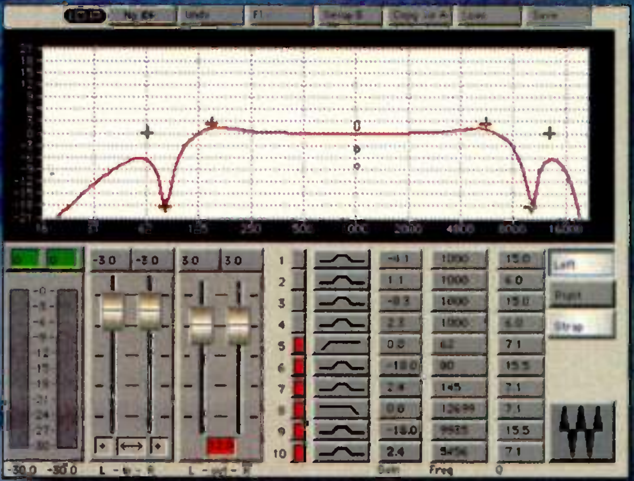
continued on page 126

Audio Plug-Ins by Waves
For digidesign SDII & TDM, Premiere and DeckII

L1- *Ultramaximizer*
C1- *Compressor/Gate*
S1- *Stereo Imager*
AudioTrack- *EQ/Comp/Gate*
TrueVerb- *Reverb/Distance*
PS22- *StereoMaker*

WAVES

usWaves Tel: 423-588-9307 Fax: 423-588-9472
ukWaves Tel:(+) 44-1637-877170 Fax:44-1637-850495
ks Waves Tel:(+) 972-3-5107667 Fax: 972-3-5105881
HomePage: http://www.waves.com
Compuserve GO WAVES



Q10 ParaGraphic EQ
The Q10 Equalizer offers flexible, surgical precision for all audio production, from subtle mastering to exceptional special effects. The 200-piece factory Setup Library provides an extensive Swiss Army knife array of user-customizable tools.

CIRCLE 69 ON FREE INFO CARD

THINK OF IT AS $22 AN INPUT, NOT COUNTING ALL THE COOL STUFF.

PL 1602 RACKMOUNT LINE MIXER

- A versatile 16-channel, 2-bus mic/line mixer with smooth, transparent audio and all the quality features you wanted but never thought you'd get—for only $349!

CHANNEL 1/2
CHANNEL 3/4
CHANNEL 5/6
CHANNEL 7/8
CHANNEL 9/10
CHANNEL 11/12
CHANNEL 13/14
CHANNEL 15/16
SAMSON
HIGH
LOW
AUX 1L
AUX 2R
LEVEL
BALANCE

- Headphone output with individual gain control.
- 2 stereo effects returns with front panel level and balance controls for interfacing with outboard effects.
- 2 balanced XLR mic inputs with local trim controls, not your typical item for this type of mixer.
- High-quality 4560 op amps for clear, quiet sonic performance.
- 2 balanced main L/R outputs with 56 mm faders.
- 8 balanced stereo line ins to satisfy your endless craving for more inputs.
- Precise 2-band equalization on each channel.
- 2 Aux sends to put more *flex* in your mix.

WHAT'S NEW?

Samson's "maximum" line mixer—the PL 2404. 24 inputs of crystal-clear audio into 4 bus outs with 3-band EQ, 2 stereo Aux sends, 4 assignable stereo effects returns, Mute and Solo and more on each channel, 2 balanced XLR mic inputs with local trim controls, plus 10-segment level metering and solo status LEDs, Balanced Stereo Main and Control Room outs, 4 channel inserts and 4 bus inserts for expanding. The real deal for an unreal $629.

SAMSON

Get up to speed on the fastest-growing line in Audio by dialing 1-800-328-2882, faxing (516) 364-3888 or writing Samson Technologies Corp., P.O. Box 9031, Syosset, NY 11791-9031.

© 1996 SAMSON

CIRCLE 57 ON FREE INFO CARD

BSS DPR-901 II DYNAMIC EQUALIZER

DYNAMIC EQUALISER

THERE ARE PLENTY of parametric EQs, but none like this. The BSS DPR-901 II does frequency-selective compression/expansion so that EQ occurs dynamically, taking effect only above or below a particular threshold (compression is similar to cutting the response at a given frequency, while expansion is similar to boosting). Some typical applications: de-ess by subtracting high frequencies above a certain threshold, bring up a low-level kick drum (but not boost it when it's prominent) by expanding low frequencies below the threshold, or add sheen to program material by increasing the highs only on low signal levels.

IN AND OUT

This 1U box works as a mono 4-stage or 2-stage "split" EQ, based on state-variable filter technology. The rear panel has a main set of XLR in/out jacks (pin 2 hot) and two additional XLR in/out jacks for when the rear-panel main/split switch is set to "split." There's also an on-off switch, IEC power cord receptacle, voltage selector, and fuse. Pin 1 on the inputs is lifted off ground, so for unbalanced use, it needs to be jumpered over to pin 3 (or pin 2 if pin 3 is "hot" in your system).

CONTROLS AND SWITCHES

Basically, the same set of controls repeats four times. Each stage has an individual in/out switch with associated status LED and the expected frequency and width controls (oddly, the bandwidth becomes narrower as you turn the control counter-clockwise; possibly this is to allow the use of common log taper pots, as opposed to rare antilog pots). However, the boost/cut function is replaced by a compression/expansion knob (with center detent for the "no dynamics processing" position), threshold control, a switch that determines whether the compression/expansion affects signals below or above the threshold, and release time switch (fast for rapidly varying signals, automatic for program material).

Metering is a blinky-light lover's paradise. Each stage has a 6-step threshold meter, 8-step compression meter, and 8-step expansion meter. These are useful not just to see what's going on, but also to hypnotize hyperactive clients. Unfortunately, the expansion and compression meters have a fair amount of light leakage between steps, so an "on" segment produces a "ghost" in adjacent segments. If you just glance over quickly, it's difficult to tell exactly how much effect is happening.

The four stages cover different ranges (40 Hz–320 Hz, 150 Hz–1600 Hz, 800 Hz–9 kHz, and 1.6 kHz–18 kHz), which limits the DPR-901 II's usefulness as a true stereo processor — two units are required for mastering. The lowest and highest stages have a bell curve/shelving response switch. The two middle stages have a filter defeat switch, which essentially turns those stages into plain compressor/expanders.

Master controls include an in/out switch with associated status LED, 4-step output meter with clip indicator, and split mode LED indicator. A master sidechain listen switch auditions the filtered signal of any active stage without dynamics processing. This is essential if you want to bring out a particular part of the spectrum, such as kick drum: listen to the sidechain, adjust the frequency and width controls to focus on the kick, then go back to normal operation and adjust the dynamics. There is no master input or output level control.

Despite the number of controls, the front panel doesn't feel cluttered; the DPR-901 II is easy, if inherently a bit time-consuming, to use.

THE ACID TEST

This is one of those "you can't go wrong" units, unless you overload it. No matter what I threw at it — from solo instruments to program material — there was always

ROAD TEST

MANUFACTURER: BSS Audio, 8500 Balboa Ave., Northridge, CA 91329. Tel: 818-227-1800.

APPLICATION: Equalize program material or individual instruments in a novel, dynamic way.

SUMMARY: If you're looking for more flexibility and potential than what you get from the average equalizer, look no further.

STRENGTHS: Innovative design; excellent sound quality, with no VCAs in the signal path; usable in 4-stage mono or 2-stage "split" mode; true, relay-operated bypass (bypasses unit even if power goes off); useful metering.

WEAKNESSES: XLRs/+4 operation only; rear-panel power and main/split switch are inconvenient; split mode not really suitable for stereo processing; no overall input or output level controls.

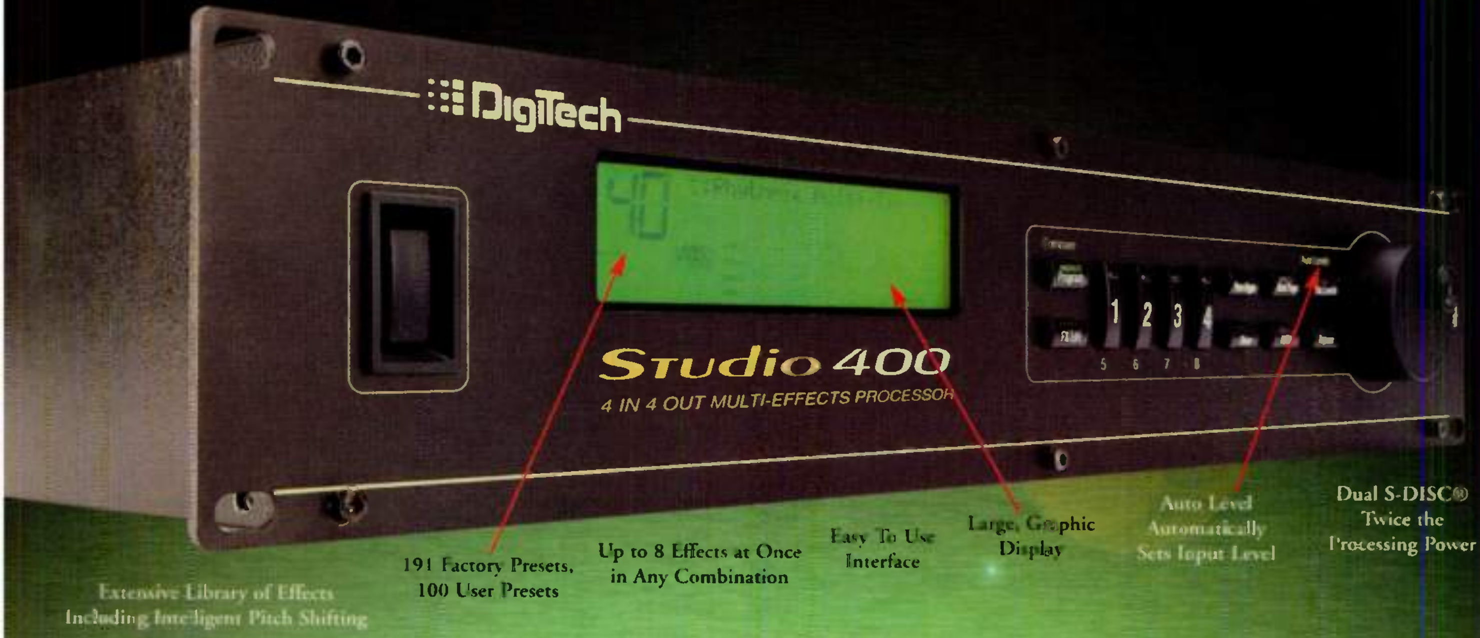
PRICE: $1549

EQ FREE LIT. #: 133

BY CRAIG ANDERTON

WRH

THE STUDIO 400 TOWERS OVER THE COMPETITION.


DigiTech
Studio 400
4 IN 4 OUT MULTI-EFFECTS PROCESSOR
Extensive Library of Effects Including Intelligent Pitch Shifting
191 Factory Presets, 100 User Presets
Up to 8 Effects at Once in Any Combination
Easy To Use Interface
Large, Graphic Display
Auto Level Automatically Sets Input Level
Dual S-DISC® Twice the Processing Power

What if you could get the processing power of four independent multi-effects processors, capable of doing up to 8 different, truly professional quality effects at once all in one affordable box? And, oh yeah, how about throwing in balanced XLR analog and digital I/O capability?

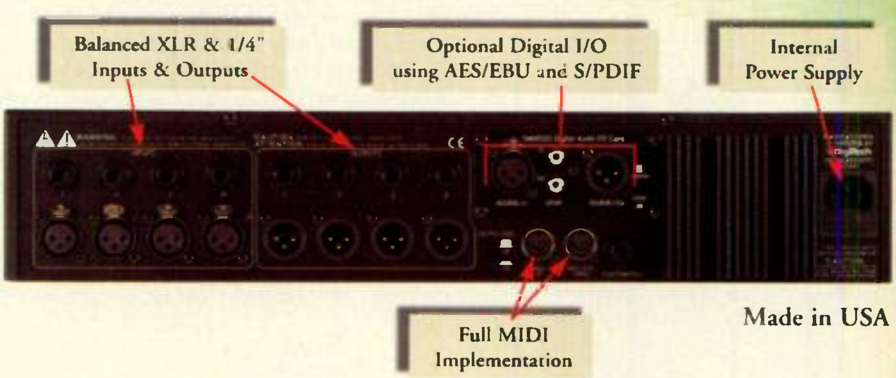
Well, it's here, the new Studio 400 from DigiTech. It does all of the above and much more! Use up to 8 high quality effects at one time in any order in an endless number of combinations. Choose from multiple Reverbs, Delays, Choruses, Flangers, Auto Panner, Intelligent Pitch Shifting, Rotary Speaker Simulator, Compressors and more.

The Studio 400's quick and easy editing capabilities make changing effects and parameters painless. And for automated studios, an extensive modifier section lets you control up to 8 parameters per program via MIDI or with the Studio 400's unique dynamic and LFO parameters. Digital studios can access the Studio 400 in the digital domain using both AES/EBU and S/PDIF formats with the optional digital I/O.

Looks like the competition just can't measure up. Get the facts. Then get the Studio 400 from your local DigiTech dealer.

	STUDIO 400	ENSONIQ DP/4+	TC M2000	ENSONIQ DP/2
Ins/Outs	4/4 - 1/4" TRS + XLR	4/4 - 1/4" TRS	2/2 - XLR	2/2 - 1/4" TRS
8 different Effects in any order	yes	no	no	no
Graphic Display	yes	no	yes	no
A/D	18 bit 128X	16 bit	20 bit 64X	16 bit
D/A	20 bit 8X	16 bit	20 bit 64X	16 bit
Sampling Freq.	44.1, 48kHz*	n/a	32, 44.1, 48kHz	n/a
Freq Response	20-20kHz	2-18kHz	10-20kHz	2-16kHz
Digital I/O	AES/EBU, S-PDIF (optional plug-in)	none	AES/EBU, S-PDIF	none
THD @ 1kHz	<0.003%	<0.0032%	0.003%	<0.0032%
S/N ratio	-96dB	-90dB	> -96dB	-90dB
Power Supply	Internal	Internal	Internal	External
Price	$869	$1799	$1995	$795

* selectable with optional digital I/O card


Balanced XLR & 1/4" Inputs & Outputs
Optional Digital I/O using AES/EBU and S/PDIF
Internal Power Supply
Full MIDI Implementation

Made in USA

DigiTech

A Harman International Company

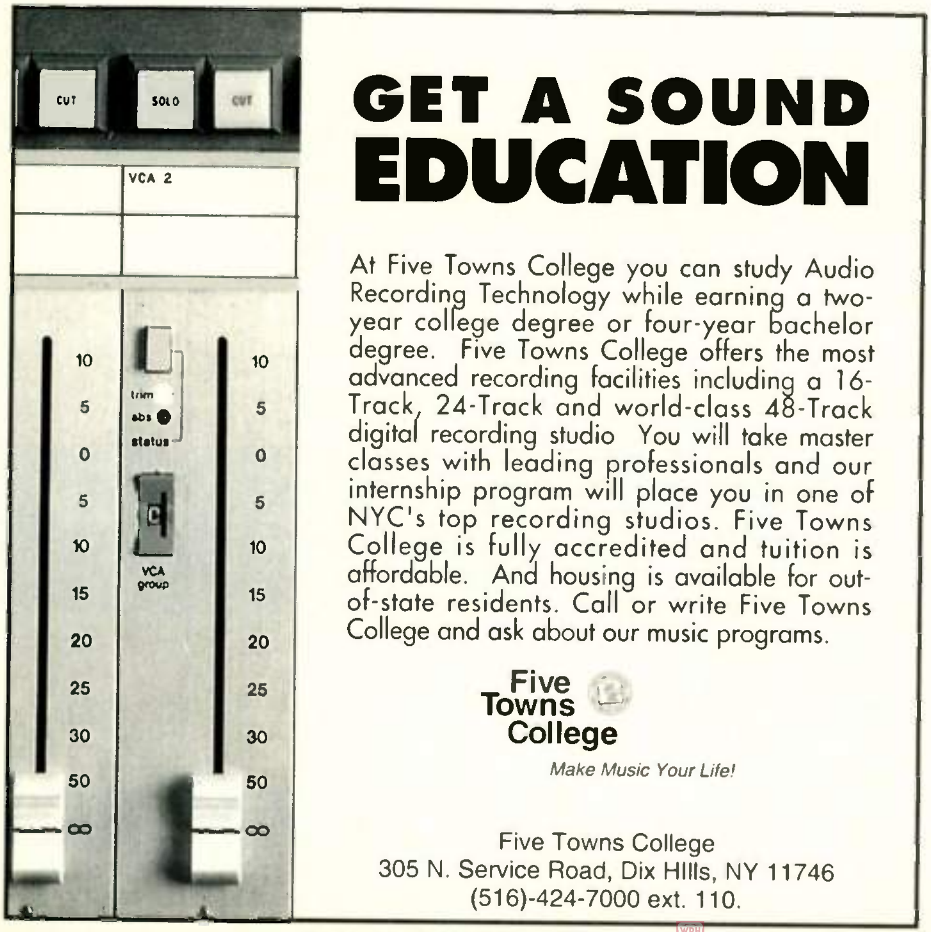
All product trademarks are the property of their respective owners.

8760 South Sandy Parkway, Sandy Utah, USA 84070 • (801) 566-8919 • Fax (801) 566-7005 • Int'l Fax (603) 672-4246 • Visit DigiTech on the World Wide Web at http://www.digitech.com

CIRCLE 22 ON FREE INFO CARD

WEST L.A. MUSIC
GUARANTEED LOWEST PRICES!
EVERY MAJOR BRAND
DIGITAL TAPE RECORDERS & WORKSTATIONS
CD RECORDERS • HARD DISC RECORDERS • MIXING CONSOLES
MICROPHONES • SPEAKERS • MACINTOSH COMPUTERS
SOFTWARE • KEYBOARDS • GUITARS • DRUMS
WE'LL BEAT ANY DEAL! CALL NOW!
NATHAN EAST WITH GARY KRAUSE - PRO AUDIO DEPT.
DAVID GARFIELD WITH JIM MONA - PRO AUDIO DEPT.
GRAHAM NASH WITH NOEL GOULD - PRO AUDIO DEPT.
"WHERE THE PROS SHOP"
Phone or Fax your order. We Ship *Everywhere.*
"Where The Pros Shop"
WEST L.A. MUSIC
11345 Santa Monica Blvd. West Los Angeles
Two blocks West of the San Diego (405) Freeway
(310) 477-1945 Fax: (310) 477-2476
ALL MAJOR CREDIT CARDS, FINANCING, AND LEASING.

CIRCLE 70 ON FREE INFO CARD


GET A SOUND EDUCATION

At Five Towns College you can study Audio Recording Technology while earning a two-year college degree or four-year bachelor degree. Five Towns College offers the most advanced recording facilities including a 16-Track, 24-Track and world-class 48-Track digital recording studio You will take master classes with leading professionals and our internship program will place you in one of NYC's top recording studios. Five Towns College is fully accredited and tuition is affordable. And housing is available for out-of-state residents. Call or write Five Towns College and ask about our music programs.

Five Towns College
Make Music Your Life!

Five Towns College
305 N. Service Road, Dix Hills, NY 11746
(516)-424-7000 ext. 110.

CIRCLE 83 ON FREE INFO CARD

some setting that made the sound just a little more wonderful. Perhaps my favorite application is with solo guitar and piano, to boost the low and high ends at lower volume levels only. When applied subtly, a static sound becomes more dynamic and interesting, since the spectrum shifts subtly at different levels. At higher levels, you don't have the stridency or boominess that would come from adding treble and bass statically.

With sampled sounds, increasing treble (or upper midrange) when signals exceed the threshold adds a more "lively" feel that more properly imitates acoustic instruments, which often sound brighter when played louder.

The only real comparison is to the Dolby 740 spectral processor; although they accomplish similar tasks on the surface, the two units have rather different attitudes. The Dolby is a true stereo device that's quicker and less expensive to set up for 2-track mastering but only operates below the threshold, while (thanks to the parametric EQ) the DPR-901 II is stronger when dealing with individual instruments, or for that matter any other application (including mastering) where you need to apply very precise changes as opposed to more general ones.

I tend to give extra points for devices that aren't just "me-too" boxes, but the DPR-901 II gets good grades by any standard. It's at once familiar due to the EQ and dynamics processing, but it uses those familiar elements to create a unique processor that lets you explore a new and useful family of effects. You may lose a few hours tweaking everything in sight when you first get this box, but you'll have a good time doing it. EQ

There Are Several $500. Compressors That Perform As Well As The dbx 262.

dbx 1
Project
CHANNEL ONE
THRESHOLD
RATIO
OUTPUT GAIN
CHANNEL TWO
THRESHOLD
RATIO
OUTPUT GAIN
Compressor/Limiter 262

Unfortunately For Them, The dbx 262 Is Less Than $200.

Save The Planet It's The Only Market We've Got.

dbx
PROFESSIONAL PRODUCTS

For more information contact us at: (801) 568-7660 Fax (801) 568-7662 dbx 8760 S. Sandy Parkway, Sandy, UT 84070 USA or if you prefer surfing to snailing send e-mail to customer@dbxpro.com

H A Harman International Company

CIRCLE 27 ON FREE INFO CARD

WRH

TECHNOMAD NOHO C LOUDSPEAKERS

WHILE IMPORTANT, owning the toughest loudspeakers in the world may not be the #1 feature you look for in a sound-reinforcement loudspeaker. Practical mounting and ease of transport should, however, rate in your top five (especially for anyone who must carry a PA between venues). Of course, sound quality must always be the priority, and that should be coupled with the ability to keep making sound under any conditions. Technomad, a Northhampton, MA-based company, has tried to address all of these concerns in its line of weather-resistant loudspeakers.

The Technomad Noho C provides a 12-inch coaxial two-way loudspeaker in a small vented box. It uses a Radian driver, which includes a ferrofluid-cooled one-inch compression driver mounted to a short horn in the center of the woofer. The cone of the woofer also contributes to the horn-loading of the device. This is a well-behaved driver that is known for its power handling and offers a nominally 60-degree conical coverage pattern. This audition was based on a pair of the earlier production models of the Noho C.

The passive internal crossover achieves uniform phase response through the crossover frequency, but I found the switchable response (see fig. 1) most useful in three of the five modes: Nearfield, Flat, and Woofer-only. The other two modes (Speech and Concert) produced sound qualities that seemed harsh and unnatural that did not conform to my expectations for these applications. The switch itself was difficult to adjust as it is recessed beyond the reach of my fingers and is quite stiff in operation. A pair of pliers was required to make the adjustment. [*The manufacturer states that they have changed the switch location on later production units.*] Technomad should consider adding a legend to indicate the switch's current position. (One of the units I evaluated was already suffering from the switch being loosened, possibly by someone trying to turn it the wrong way.)

In the "flat" crossover setting I found the Noho C to produce a musical quality that is full and has an extended high-frequency response. The Nearfield setting produced the most balanced overall sound. However, the midrange is less forward than many loudspeakers of this size, and the 12 kHz bump (near on-axis) in the response tends to accentuate the sparkle of cymbals and also make hiss from less-than-perfect sources more apparent. The low-mid range tends to dominate an amplified voice, making it a little nasal. However, the negative sound qualities can easily be reduced with a little EQ.

Technomad suggests boosting the low frequencies (100 Hz and below) to improve the response for general purpose use, but I found this boost simply accentuates the limitations of compact boxes, making the sound tubby and less musi-

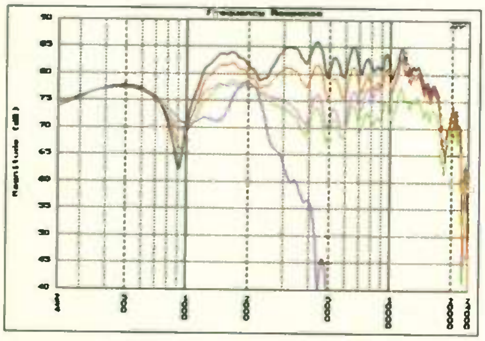


FIGURE 1: **The crossover of the Noho C includes a switch for five different contours intended for a variety of applications. The designations are Voice (black); Nearfield (green); Flat (purple); Concert (red); and 12-inch Woofer-Only (blue). Measured on-axis at 1 meter.**

ROAD TEST

MANUFACTURER: Technomad, 340 Riverside, Northhampton, MA 01060. Tel: 413-584-4842. WWW: http://www.technomad.com.

APPLICATIONS: Sound reinforcement and playback loudspeaker for clubs, small outdoor concerts, A/V presentations, and theater.

SUMMARY: A practical package for many sound-reinforcement applications, especially those where a single 60-degree coverage pattern will suffice.

STRENGTHS: Case includes a range of mounting possibilities; water-resistant; reliable Radian coaxial driver; rugged; includes integrated lid.

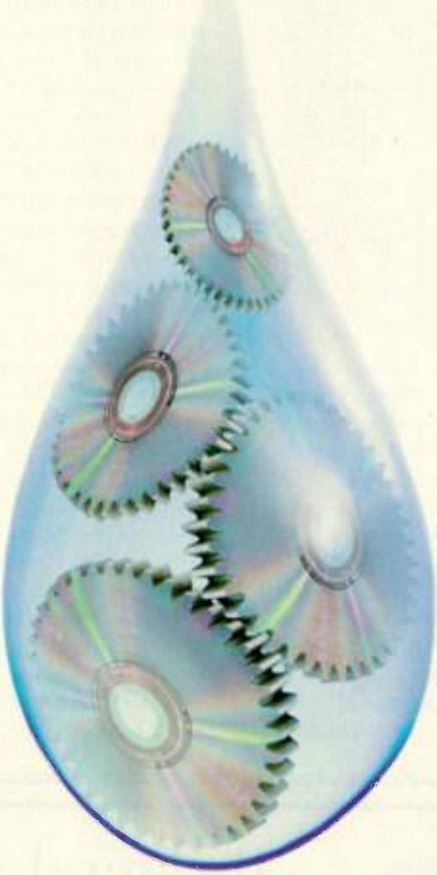
WEAKNESSES: Crossover switch difficult to adjust; cables connect at front of cabinet on touring model.

PRICE: $1194, Touring Version (as reviewed), $960, Base Model.

EQ FREE LIT #: 134

BY WADE MCGREGOR

©1996 TDK and the TDK logo are registered trademarks of The TDK Electronics Corporation.



INTRODUCING A LINE OF RECORDABLE MEDIA FOR PERFECTIONISTS. THE TDK PRO LINE. IT'S PURE PRECISION. BECAUSE EVERY FORMAT, EVERY LENGTH, EVERY GRADE IS 100% SPECIFICATION GUARANTEED. FOR YOUR FINEST WORK. IT'S MORE INNOVATION FROM THE PEOPLE THINKING ABOUT WHAT YOU DO, AND THE TOOLS YOU NEED TO GET AHEAD. FROM THE COMPANY THAT'S TAKING PROFESSIONAL RECORDING FAST FORWARD.

TDK PRO
PROFESSIONAL
Hi8
HI8MP120
SM-X60
CD-R63
750
1350
120
VHS
VM120
DAT
DA-R120

For more information on our complete line of recording products, please call 1-800-TDK-TAPE or check out our site on the World Wide Web.

TDK.

http://www.tdk.com

CIRCLE 85 ON FREE INFO CARD

TECHNOMAD NOHO C SPECIFICATIONS

Frequency Response: 60 Hz to 17.5 kHz
Sensitivity: 102.5 dB SPL pink noise 1 W/1 m
Peak SPL: 118.5 dB (C-weighted not full bandwidth)
Dispersion: 60 degree x 90 degree
Crossover Frequency: 1200 Hz
Nominal Impedance: 8 ohms
Power Handling: 300 W continuous
Physical Size: 20.75" x 15" x 10.5" (52.7 cm x 38.1 cm x 26.7 cm)
Weight: 48 lbs. (21.8 kg)

cal. They also suggest some very radical EQ to extend the response to 40 Hz (up to +15 dB in the user manual!), but this is potentially hazardous to the driver and will definitely use up all of your amplifier power unless you are using these loudspeakers at very modest SPLs.

As might be expected, the small port in the cabinet begins to "chuff" at very low frequencies, so if you need subbass, use a subwoofer (such as the Chicago 15/12 included in the Technomad range). This will give you much better results and the speakers are more likely to last through the gig. The Noho C provides quite usable response to below 80 Hz and is quite punchy at higher volume levels without any low-frequency boost.

The woofer-only crossover mode is a useful idea for those who must maintain an inventory of similar loudspeakers but find they have to meet a wide range of needs. The ability to turn off the high-frequency device in some boxes offers the potential to supplement the low-frequency power of your system by adding more Noho C units with the HF turned off. As you can see in fig. 1, this mode would still require low-pass filtering (<200 Hz), as the 12-inch driver is still capable of producing 2 kHz (even if it is not so pleasant or smooth in coverage). The compact boxes would couple together very well below 200 Hz and provide an easy way to enhance the level or power handling of the system at low frequencies.

The Technomad enclosure is a military-style flight case of molded polyethylene that forms an extremely rugged enclosure that meets aircraft shipping requirements (ATA III as well as Mil-Spec 810E) when the lid is attached. A great deal of effort has gone into making this a durable case suitable for use in harsh conditions. An additional front grille enhances the weather-resistant qualities of the touring model, but could benefit from better damping (low-midrange ring). The internal damping of the cabinet is achieved using polyurethane and polyethylene foam. The cabinet of the review unit was shiny black, but the Noho C is also available in red, yellow, olive drab, forest green, light blue, dark blue, purple, gray, and white.

The Touring model includes four standard 1.5-inch stand-mount sockets

continued on page 126

The ZSYS Digital Detanglers:
z-8.8, z-8.8r, z-16.16r, and now the z-32.32r

If digital was supposed to make things easier, why do you have a snakepit behind your rack of digital gear?

Tired of battling the constant tangle of cables every time you need to configure and reconfigure your set-up? Wondering how you're going to make *this* AES/EBU device talk to *that* S/PDIF device or *that* optical device? Let a ZSYS **Digital Detangler** take care of your digital audio interface problems so you can get on with more important things. Whether you need **8, 16,** or even **32** ins and outs... manual, remote, or software control....... even format conversion and custom configurations.... one of our **Detanglers** is perfect for you.

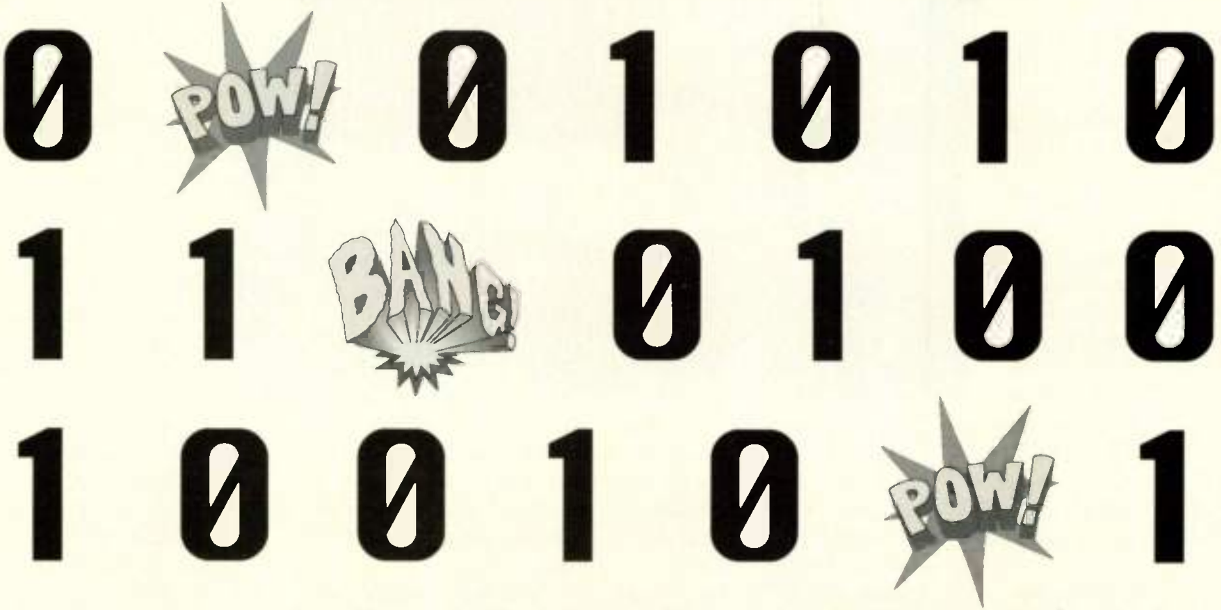
ZSYS—The last name in audio engineering.

Z-Systems Audio Engineering
4641-F NW 6th Street
Gainesville, Florida USA 32609
Tel: 352-371-0990 Fax: 352-371-0093
z-sys@z-sys.com *http://www.z-sys.com*

ZSYS.

CIRCLE 79 ON FREE INFO CARD

Hey, it's not like you can actually hear a little voltage fluctuation, right?



Use a Furman Voltage Regulator and you'll never have to find out.

No, not directly — unless you like to plug your headphones right into an AC wall socket. You'll hear it in the audio or see it in the video instead. AC line voltage irregularities can cause audio tonal changes in analog and tube equipment. Borderline voltage sags can cause random data loss in digital and MIDI equipment. When the line dips a volt or two lower, equipment ceases funtioning completely. At the other end of the scale, voltage spikes and surges can add pops and clicks, and, in extreme cases, cause permanent damage.

All Furman voltage regulators are designed specifically to protect sensitive audio, video, and computer equipment from these catastrophes. We offer tighter regulation and deliver the required output voltage over a wider range of input voltages. We use low magnetic radiation, efficient toroidal autoformers and switch taps only at voltage zero-crossings, to avoid *creating* glitches in the AC waveform. And not only will a Furman regulator provide clean, filtered, spike-suppressed power to your delicate equipment, but if it senses abnormally high or low voltage (such as from inadvertently connecting to 220V instead of 120V), it will instantly shut down, protecting both itself and the rest of your gear.

There are seven AR-Series regulators to choose from, providing output voltages of 120V for North America or 100V, 220V, 230V, or 240V required elsewhere, at currents of 6A to 30A. Furman also makes a complete line of power conditioning, power sequencing, power distribution, and 60V/120V balanced isolation equipment. Contact us for details.

FURMAN

FURMAN SOUND, INC.
30 Rich Street • Greenbrae, CA 94904 USA
Tel: (415) 927-1225 • Fax: (415) 927-4548

A.C. LINE REGULATOR
INPUT VOLTAGE
OUTPUT IN REGULATION
EXTREME VOLTAGE SHUTDOWN
FURMAN
Power Conditioning
REGULATED OUTLET
POWER
ON
OFF

Furman products are made in the U.S.A.

CIRCLE 33 ON FREE INFO CARD

WHIRLWIND MIC ELIMINATOR

whirlwind
Mic Eliminator
INPUT
AMP
INST
DARK
BRITE
LIFT
GND
DIRECT OUTPUT

Whirlwind has over the years produced (and continues to do so) an entire range of direct boxes for connecting unbalanced sources, such as guitars, synths or samplers, to mixing consoles. The new Whirlwind Mic Eliminator, though, is intended for a much more specific application. Instead of simply transferring the sound of the guitar pickups directly to the microphone input for further processing, the Mic Eliminator handles the equalization right in the box. The resulting sound is very much like taking a good dynamic microphone and placing it up close to one of the loudspeakers in a guitar amp.

The Mic Eliminator does not attempt to add tube distortion artifacts or any overdrive characteristics to the sound. Instead, it offers two tone settings similar to microphone positions used in picking up the sound of guitar amps: 1) Brite: Emulates the sound of a mic out in front of the amp on a floor stand; 2) Dark: Emulates the sound of a mic tight to the loudspeaker, similar to dangling the microphone down the front of the guitar amp from the mic cable. The Dark setting is typical of the proximity effect (bass boost) that this use of a cardioid microphone will yield. There is no bypass for the equalization, thus making this unit very specifically intended for signals direct from an electric guitar or guitar amp.

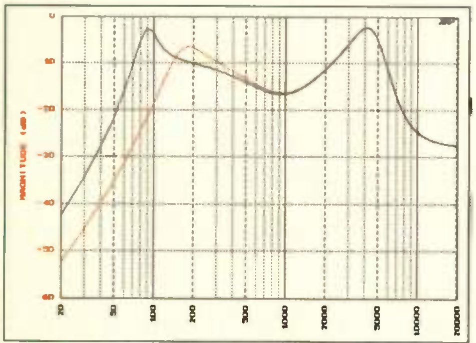


FIGURE 1: The radical equalization of the Whirlwind Mic Eliminator is intended to emulate the response of a guitar amplifier's loudspeaker picked up by a mic on-axis (red curve) in Brite mode and off-axis (black curve) in the Dark mode.

The two settings are radical tone-shaping filters (see fig. 1) that simply differ at low-frequencies. This makes the Mic Eliminator fall into the same category as transducers (microphones and loudspeakers) that must be selected by ear to suit the taste of the user. The Mic Eliminator does offer a nice clean guitar sound that suited some playing styles for the Fender Stratocaster and Gibson Les Paul Jr. I plugged into it. However, it is much less suitable for bass guitars and, except perhaps for some clavinet-type sounds, was even less suitable for use with a synth or sampler. (Of course, this unit is specifically intended for electric guitars.)

The ideal application for the Mic Eliminator is taking a parallel of the loudspeaker output from a guitar amp. This captures the tone provided by the amp and emulates the qualities of a microphone and loudspeaker. This box produces a specific guitar sound that, if it suits you, will save you a lot of time trying to achieve that sound with an equalizer.

The Mic Eliminator is housed in a bright mauve aluminum case with recessed connectors and pushbuttons for tone, ground-lift, and guitar/amp output level selection. Two screws on the bottom of the unit provide access to the battery compartment. The printed-circuit board that carries all of the unit's active circuitry is cantilevered from the solder connections on the 1/4-inch phone jacks. This mounting arrangement could damage the PC-board should the Mic Eliminator accidentally fall from the top of your Marshall stack. [*Whirlwind states that it has passed their most stringent drop tests.*]

The unit can be powered by a mixer's phantom power or with an internal 9-volt battery (rated for 300+ hours of use). The battery reduces the headroom by 8 dB and there is no visual

ROAD TEST

MANUFACTURER: Whirlwind Music Distributors, Ltd., 99 Ling Road, Rochester, NY 14612. Tel: 716-663-8820.

APPLICATIONS: An active DI box intended as a direct replacement for miking guitar amplifiers in the studio, control room, or on stage.

SUMMARY: Radical equalization offers the tonal characteristics of miking some common guitar amps but without the distortion or leakage problems sometimes associated with using a mic.

STRENGTHS: Instantly offers the tone of an SM57 on a 12-inch guitar loudspeaker; switchable low-frequency response; choice of battery or phantom power.

WEAKNESSES: No power status indicator; tonal quality hard to undo with console EQ; noisy relative to typical DI boxes.

PRICE: $99

EQ FREE LIT. #: 135

BY WADE MCGREGOR

WRH

indication of the battery or phantom power status on the unit. The balanced output impedance of the unit is 600 ohms, four times higher than most devices intended to connect to a microphone input (nominally 150 ohms). This may result in the Mic Eliminator's electronic performance changing very slightly from one console input to the next. [*Note: The output impedance is approximately the same as that of similar products on the market.*]

The Inst./Amp switch changes the maximum input level from +8 dBm (Instrument) to +48 dB (Amplifier). The Amp setting allows a direct connection to the output of a guitar amplifier using the direct output jack to feed signal to the amp's loudspeaker. This switch adds a –40 dB pad and changes the input impedance from 1 Megohm to 15 kohms. There was noticeable hiss from the unit at the gain settings used with the direct output of a guitar (Inst. setting), but the noise is well below that of a typical tube amp rig in overdrive — and probably what many guitarists are looking for.

Unlike typical direct boxes, the Mic Eliminator offers to emulate the loudspeaker/microphone combination that captures the sound of a guitar amp, and thereby eliminates the microphone from the equation. This reduces the potential for leakage from other instruments into the guitar channel, cleans up the stage setup, and frees-up a microphone for that last-minute addition of a conga player to tonight's performance. At this very affordable price, the Microphone Eliminator also can free up some cash for new tubes in your amp.

RECORDING EQUIPMENT

—All Major Brands—

FOR STUDIOS/HOMES
CHURCHES/CLUBS

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

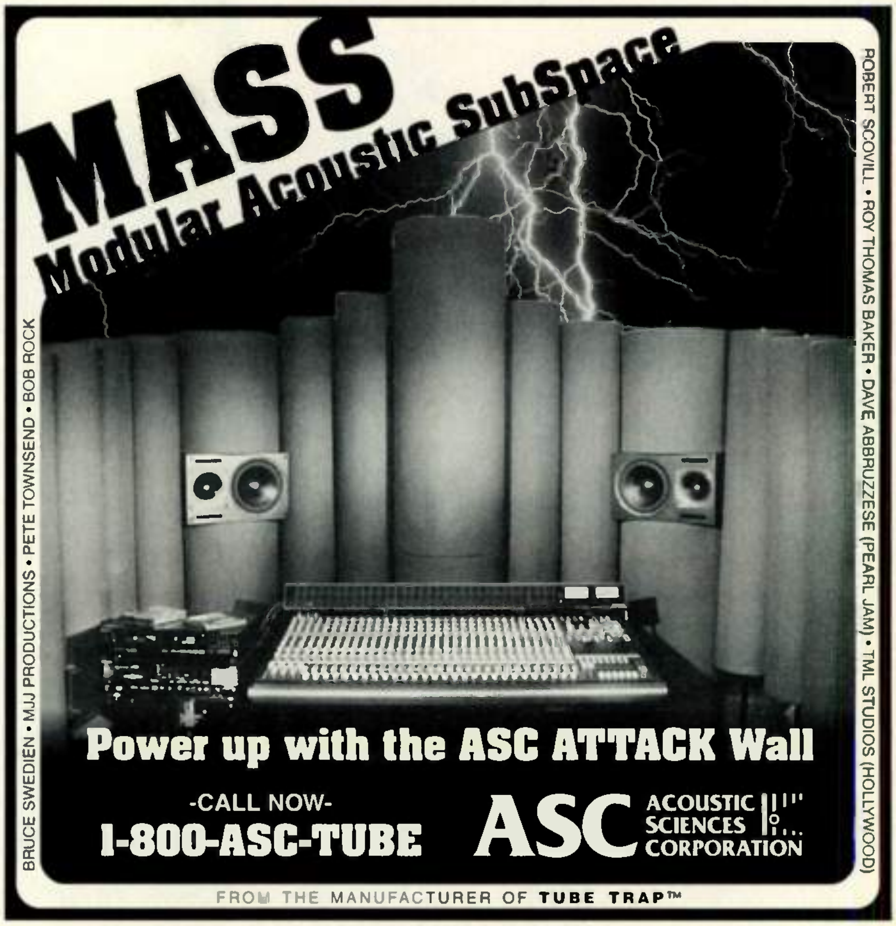
TASCAM
TEAC Production Products

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

Call for pricing information.

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

CIRCLE 54 ON FREE INFO CARD



MASS
Modular Acoustic SubSpace

BRUCE SWEDIEN • MJJ PRODUCTIONS • PETE TOWNSEND • BOB ROCK

ROBERT SCOVILL • ROY THOMAS BAKER • DAVE ABBRUZZESE (PEARL JAM) • TML STUDIOS (HOLLYWOOD)

Power up with the ASC ATTACK Wall

-CALL NOW-
1-800-ASC-TUBE

ASC ACOUSTIC SCIENCES CORPORATION

FROM THE MANUFACTURER OF TUBE TRAP™

CIRCLE 84 ON FREE INFO CARD

CUSTO

PUERTO RICO
1-800-804-9588

AVL0496-2

M CDs IN JUST 3 WEEKS!

300 CDs for only **$1,590**

with black & white inserts

Includes FREE design!

BEATRIZ
STreetS L.A.
BEATRIZ

"I recommend Disc Makers to anyone who wants a manufacturing house that gets it right the first time."
– Beatriz
La Miranda, CA

Stand out from the crowd.

Compete with the majors. Make it on your own. At Disc Makers we custom-craft every project for a truly unique finished CD or cassette.

Our award-winning graphic designers make your cover design a work of art, while our mastering engineers can give your production that final touch it needs for airplay.

Best of all, you get your masterpiece in record time, so you'll never miss another release date. Call us today to find out why thousands of satisfied artists use Disc Makers each year to kick their careers into high gear.

Call today for your FREE 1996 full color catalog:
1-800-468-9353
24 HOURS TOLL FREE
Outside USA call 609-663-9030; FAX 609-661-3458
http://www.discmakers.com

DISC MAKERS

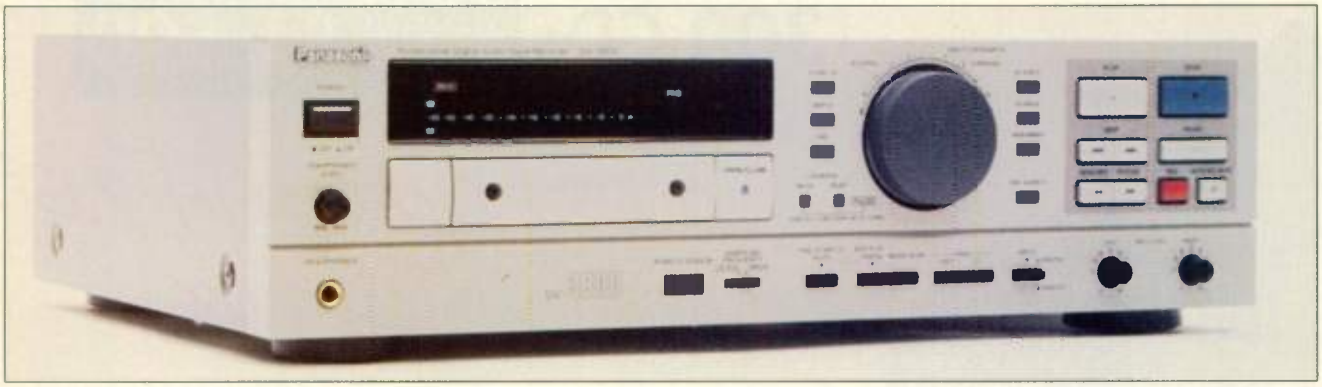
AMERICA'S #1 MANUFACTURER FOR THE INDEPENDENT MUSIC INDUSTRY

CIRCLE 32 ON FREE INFO CARD

NEW YORK	**SAN FRANCISCO**	**LOS ANGELES**	**PHILADELPHIA**
1-800-446-3470	1-800-869-0715	1-800-731-8009	1-800-468-9353

IN REVIEW

Panasonic SV-3800 DAT Machine



WHEN DOES A new piece of gear feel like a comfortable old shoe? Let me count the ways...

1. Panasonic's familiar front-panel interface needs no reinvention. Originating with the SV-3700, this user interface has been cut and pasted on to the SV-4100 and now (ta-da!) the SV-3800.

2. The Counter Display Mode button toggles the fluorescent readout to indicate: absolute time; program time; remaining time; tape counter; and peak margin (A new feature that helps you maximize the record level.)

3. The Auto Program Number/ Start ID button has been enhanced so that its threshold can be adjusted. Whenever this function is turned on, the display momentarily indicates (for 1.6 seconds) the threshold level from –60 dB to –20 dB. While the level is indicated, the button can again be pressed to step through this range in 10 dB increments.

4. Panasonic has always provided error rate indication (ERI) on all of its DAT machines. For models after the SV-3500, this is accomplished by simultaneously pressing the Mode, Reset, and Pause buttons. Though once considered the domain of technicians, this magic combination now unlocks the door to an extended feature set that includes front-panel access to the AES and S/PDIF ports as well as a record margin indicator. These same features were introduced with the SV-4100 (reviewed in the May '95 *EQ*).

The ten "extended" features are: digital I/O select (AES, COAX, TOSLINK); output "flavor" (i.e., Commercial or Consumer); error rate display (AB, A and B heads); single play mode On/Off (Park at next ID or not); blank skip mode (Recognizes the end of program by the absence of audio); SCMS mode (Copy-free, Copy-restricted, Copy-prohibited); nominal output level (adjustable from +4 dBu to –10 dBu) solves almost any interface problem; head cylinder rotation time; mechanical error codes; and peak level mode (a new feature not available on the SV-4100).

5. The infrared remote control (IRC) provides access to programming features (access play and program play) not accessible from the front panel. In addition to all of the standard functions, any audio recording with a Start ID can be accessed and/or programmed to play (or cue to Pause) in a specific order. Couch potatoes rejoice!

6. Inside, the 20-bit D-to-A converters ensure that 16 good bits come out. I have an acid test that will prove if they do. Read on...

7. On the back panel are more ports than in a wine cellar. Not only AES and coaxial IEC, but also TOSLINK (optical), plus a parallel remote connector. The 8-pin, nine-conductor DIN connector (Remote Transport Control) can access Play, FF, RW, Skip, Pause, Record, and Stop functions. Hardware hackers will love that it's a full-featured, 8-bit, parallel port.

8. The front-panel Record and Balance pots are gone. As with the SV-4100, they've been replaced by separate, Left and Right, Record Level Pots. FADE OUT/IN, though usable, is one feature that could be smoother. Harmonically rich program material is more forgiving than steady state tone, where the steps become much more obvious.

9. The Shuttle Search knob controls the tape speed in four steps. The two speed ranges are for play and pause, respectively. They are: 3X, 5X, 9X, and 15X or 1/2X, 1X, 2X, and 3X standard playback speed.

MANUFACTURER: Panasonic Broadcast & TV Systems Company, One Panasonic Way, Secaucus, NJ 07094. Tel: 714-373-7277.

APPLICATION: Stereo digital audio tape recorder.

SUMMARY: Software enhancements make this familiar-looking machine even more functional.

STRENGTHS: Front-panel access to rear-panel ports; level margin and error rate indicators; plus many more!

WEAKNESSES: Separate input level controls rather than master and balance controls.

PRICE: $1695 with IR remote

EQ FREE LIT. #: 137

WRH

EQ PRESENTS:

1ST ANNUAL

RECORDING & SOUND BUYER'S GUIDE

REACH NEW BUYERS AND NEW BUSINESS

Reach over **85,000** Recording & Sound Musicians, Engineers, Producers

Over **5,000** New Products

Coming in **SEPTEMBER** 1996!

Featuring: **THE MOST Important Reviews Of The Year in Review**

AUDIX
OM-3xb
USA
GLOBAL

10. If you buy the SV-3800, keep this review. Their manual still reads like the *AES Journal*.

When Panasonic introduced the SV-4100 ($2695) last year, its strong suit was a built-in memory buffer that provided instant audio from Play or remotely via General Purpose Interface (GPI). The SV-3800 is essentially the same machine, *sans* memory and GPI, with a sonic upgrade from 18-bit to 20-bit D-to-A converters.

Some readers have pointed out that I rarely comment on sonic quality within reviews. The question is: How does one compare a product that sells for less-than-or-equal-to a dedicated Digital Audio Converter (DAC) set? My reasoning is that, unless a product reveals audible distortion, it is "acceptable." You want better sound? Buy dedicated converters.

After last year's DAT round-up [*EQ*, May '95], I created a test which seems to weed out problematic D-to-A converters, or, more precisely, failure on the part of either the electronic design or the actual PCB layout to fully realize the potential of the converters. The test consists of a 1 kHz sine wave recorded 30 dB down from digital maximum (0 dB) that slowly fades to black. (This fade was created in the digital domain on the Soundscape SSHDR1.) This simple listening test requires the user to raise the monitor level as the tone fades to infinity. The SV-3800 remained clean into the "darkness" of audio black.

SERVICE PERSPECTIVE

Compared to an SV-3500, you could build a small studio apartment into an SV-3800. Panasonic's Large Scale Integration (LSI) department took an already compact set of three printed-circuit boards (for the SV-3700) and condensed them into one PCB.

As a repair technician, I appreciate when manufacturers make life easier for me. Too often, original equipment manufacturer's (OEM) transports are stuffed into name-brand products. When a model fails to capture market-share, it is discontinued long before its useful life. You can wait a mighty long time for parts that are not normally stocked items, and, the really bad news is that OEMs never sell parts.

This is not the case with the Panasonic family of transports, all of which are made "in house." The SV-3800 continues the tradition of being quite easily serviced. Parts for discontinued family members (the SV-3200 and SV-3700) will continue to be available.

Panasonic has done a great job of doing what seems logical — they've created several DAT models built around a common transport and a familiar face. This variation-on-a-theme approach makes it easier for them to build affordable boxes. In an industry as small as ours, the price versus performance ratio is key, and Panasonic has the secret. Enjoy the SV-3800. It comes from good stock. —*Eddie Ciletti*

BROADCAST VIDEO
PRO-AUDIO
MULTIMEDIA
AUDIO VISUAL
INTERFACE
CUSTOM CABLING
You.

POWER TEAM MARKERTEK.™
America's Largest Systems & Equipment Catalog.

America's Broadcast Supply House.™

312 PAGE CATALOG FREE !

REQUEST IT TODAY !

Featuring Custom Cables □ Custom Patch Bays □ Custom Patch Panels □ Video & Audio Cables □ Connectors • Bulk Cable • Patch Cords • Fiber Optics □ Switchcraft □ Neutrik • In-Line Audio Adapters • Patch Bays □ Audio Interface Boxes □ Midi Interface • Duct, Reels, Ties, I.D. Supplies, Crimp Tools, Strippers • Tool Kits • Power Cords • Power Centers • Power Inverters • Equipment Racks & Accessories • Telephone Interface • Computer To Video • Character Generators • Teleprompting • Delay Lines • Hum Eliminators • Time Code • Timers • Test Equipment • Signal Generators • Encoders & Decoders • TBC • Stick-Ons • Rack-Ups • Distribution Amps • Audio/Video Switchers • AV Mixers • Audio Distribution • Audio Mixers • Power Amps • P.A. Speakers & Monitors • Crossovers • Analyzers • EQs • Multi Effects • Psycho Acoustical • Noise Gates • Mic Preamps • Compressors/Limiters • Direct Boxes • Multi-Track Recorders • DAT Recorders • Cassette Decks • Studio Reference Monitors • Microphones & Accessories • Wireless • Mic Stands • Mic Accessories • Headsets & Headphones • Intercoms • Listening Centers & Systems • P.A. Systems • Lecterns • Audio Cassette Duplication • Cassette Recorders • Sound Systems • TVs • VCRs • Camcorders • Video Printers • Video Tape Duplication • Standards Conversion • TV Mounts • Portable Lights & Batteries • Camcorder Batteries & Chargers • Rack Cases • Equipment Cases • Shooting Supplies • Lighting Equipment • Overhead Projectors • LCD Panels • LCD Projectors • Projection Screens • Wall Rail Systems • Slide Projection • Visual Presentation • Film Projectors • Film-To-Video • Presentation Boards • Easels • Copy Stands • Laminators • Binding Equipment • Labels • Warning Lights & Signs • Music & Video Libraries • Audio & Video Tape – Stock, Storage, Albums, Reels, Cleaners, Demagnetizers, Edit Blocks & Rewinders □ High Tech Storage • TV & AV Carts • Furniture • Hand Trucks • Acoustic Foam & Barriers ... PLUS LOTS MORE!!!

MACKIE.
TASCAM
Genelec
SONY
SENNHEISER
audio-technica
SHURE
TANNOY
Electro-Voice
TecNec
LE ANAHE
Studiomaster

PLUS 400 OTHER TOP LINES AT LOW PRO-NET PRICING !

We're Fast • Friendly • Knowledgeable

WE'RE HOME OF THE UNIQUE & HARD-TO-FIND

SALE! PLUS FREE ADHESIVE!
MARKERFOAM™ ACOUSTIC FOAM
GIANT 54"x54"
Immediate Shipping
2" Reg. $29.95. Now $19.99
3" Reg. $39.95. Now $29.99
KILL NOISE QUICK! High performance, full size sheets of super high density Markerfoam. EZ mount. Blue or gray. Super-effective sound absorption for studios. Markerfoam offers best value, looks professional and is proven in studios worldwide. Request Foam-Buyers Guide/Catalog, specs and free samples today. VISA, MC, AMEX, COD, POs, QUANTITY DISCOUNTS.
MARKERSTIK™ foam adhesive. FREE with any foam purchase in this ad. Limited Offer. A $5.95 per tube value.

MARKERTEK BLADE TILES
HIGH PERFORMANCE
LOW, LOW COST!
$3.49 per tile, 16x16x2". America's best acoustic tile value, only from Markertek. Charcoal. Also available 16x16x3" as shown. $4.49 each.

SONEX
ALL THE COLORS & SIZES
PLUS GREAT PRICES!

MARKERTEK JUMBO
SOUND ABSORB BLANKETS
Heavy duty, 72" x 80" padded blankets absorb sound whenever they're hung or draped. Fabulous for stage, studio and field use. Top professional quality at a super saver price. Weight: 6 lbs. Black $19.99

MARKERTEK®
VIDEO SUPPLY
800-522-2025 • 914-246-3036 • Fax 914-246-1757
4 High Street, Saugerties, NY (USA) 12477
Browse Markertek on the World Wide Web: http://www.markertek.com/

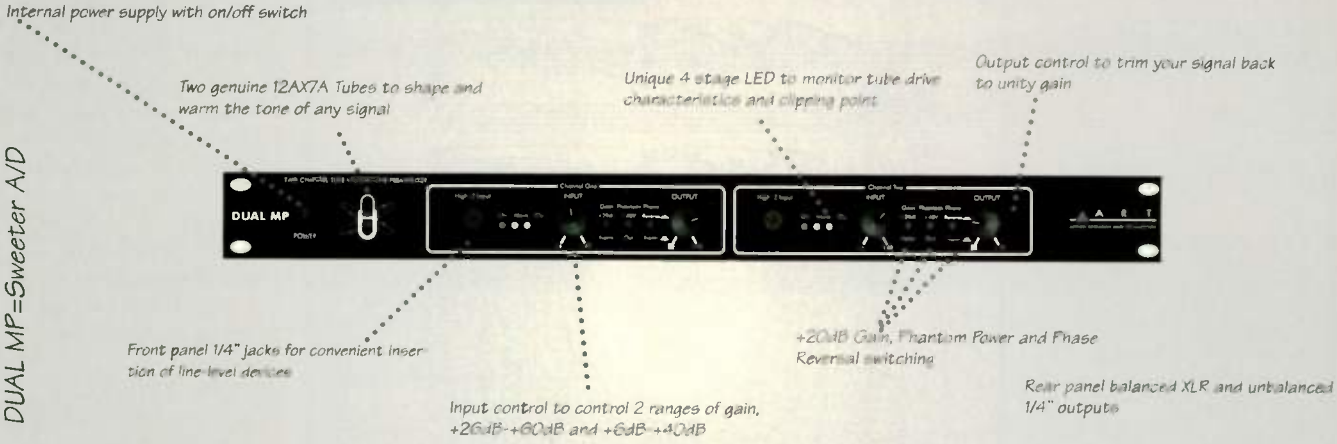
CIRCLE 43 ON FREE INFO CARD

OK, so you saved up your pennies and managed to get that Modular Digital Multitrack machine that you've had your eye one for what seems like forever. You eked out enough cash for a super-cool 8-bus console to feed your new deck, and if you were smart you even got an A R T MDM-8L Eight-Channel Limiter to keep the danger of digital clipping a non-issue. But after tracking your current opus, you can't help but think that there's something missing when listening back to your digitally-pristine new tracks. No smooth tape compression. No subtle coloration or mild distortion that accustomed to hearing. No warm fuzzies. And you wonder...

"HOW DO I MAKE DIGITAL BEHAVE LIKE ANALOG?"

SIMPLE...

Introducing the **DUAL MP** Two Channel Tube Microphone Preamplifier


Internal power supply with on/off switch
Two genuine 12AX7A Tubes to shape and warm the tone of any signal
Unique 4 stage LED to monitor tube drive characteristics and clipping point
Output control to trim your signal back to unity gain
DUAL MP=Sweeter A/D
DUAL MP
Front panel 1/4" jacks for convenient insertion of line level devices
Input control to control 2 ranges of gain, +26dB-+60dB and +6dB-+40dB
+20dB Gain, Phantom Power and Phase Reversal switching
Rear panel balanced XLR and unbalanced 1/4" outputs

Digital recording is perfect for reproducing exactly what you feed your machine, all with incredible fidelity and specs. But it's what you're not hearing that makes your recordings sterile and lifeless. The A R T DUAL MP is perfect for taking your microphone signal (or any input signal for that matter) and adds all the warm, round, and ever-so-slightly distorted tonal characteristics that makes the personality of analog recordings so pleasing to the ear. All without sacrificing your digital specs due to the DUAL MP's superior analog circuit design. Although the DUAL MP was designed as the remedy for icy-cold digital tracks, it also makes a great direct box, making it an indispensable tool for the live sound person as well as the home and pro recordist...analog and digital alike. And the DUAL MP does all of this at a price that rivals any other product of its kind, a mere fraction of what it cost you to get into digital recording in the first place...money well spent considering a DUAL MP may save you from turning around and pawning off your new digital studio. Go to your A R T Dealer to check out the DUAL MP today.*

THE A R T DUAL MP...

PUT SOME ANALOG BACK INTO DIGITAL

THE NEW A R T...SOUND SOLUTIONS FOR THE REAL WORLD

APPLIED RESEARCH AND TECHNOLOGY, INC., 215 TREMONT STREET, ROCHESTER, NY 14608
Phone 716.436.2720, Fax 716.436.3942
http://www.artroch.com, artroch@cis.compuserve.com, artroch@aol.com

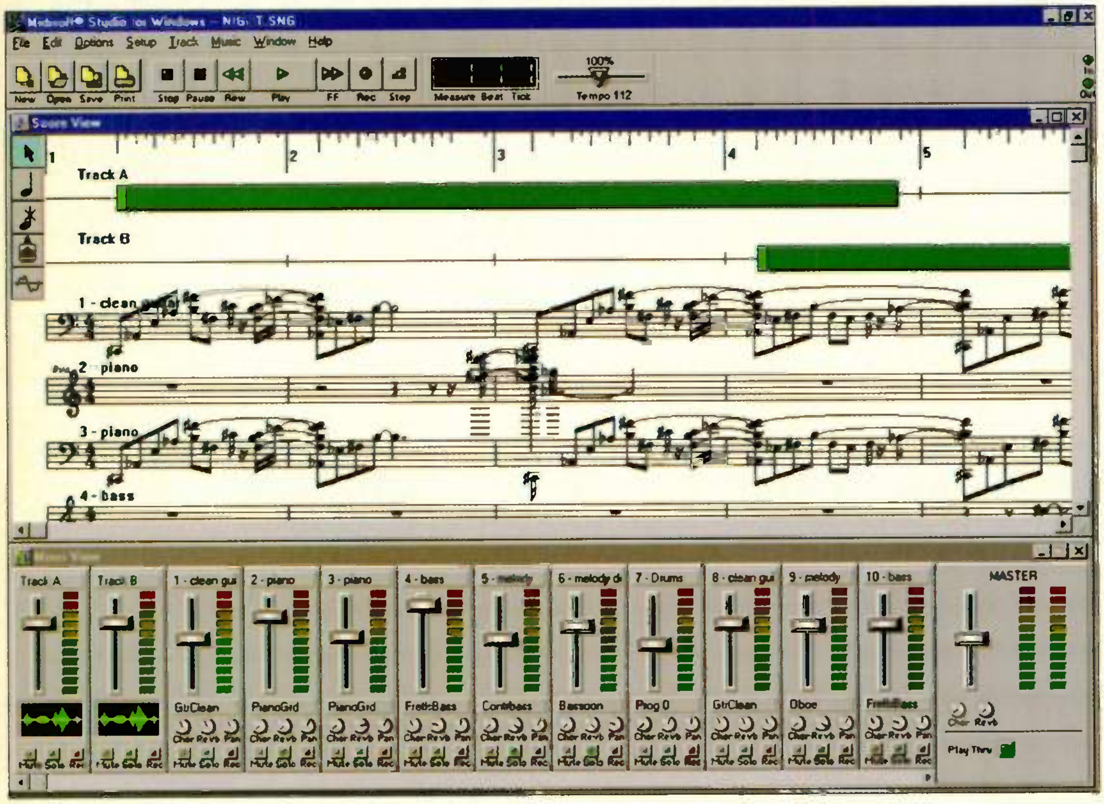
A R T
APPLIED RESEARCH AND TECHNOLOGY

*For complete features and specifications, contact A R T today. If outside the U.S., contact your A R T Distributor for complete information and availability.

CIRCLE 08 ON FREE INFO CARD

IN REVIEW

Midisoft Studio 4.0


Midisoft® Studio for Windows - NIGHT.SNG
File Edit Options Setup Track Music Window Help
New Open Save Print Stop Pause Rew Play FF Rec Step
Measure Beat Tick
100%
Tempo 112
Score View
1
2
3
4
5
Track A
Track B
1 - clean guit
2 - piano
3 - piano
4 - bass
Mixer View
Track A
Track B
1 - clean gu
2 - piano
3 - piano
4 - bass
5 - melody
6 - melody
7 - Drums
8 - clean gui
9 - melody
10 - bass
MASTER
GtrClean
PianoGrd
PianoGrd
FretlsBass
Contrbass
Bassoon
Prog 0
GtrClean
Oboe
FretlsBass
Chor Revb Pan
Mute Solo Rec
Play Thru

IMAGINE THE PERFECT PC MIDI sequencing software. Imagine the price tag. Now come back to reality. Since not everyone can afford the system they dream about, Midisoft offers its budget sequencing package, Studio 4.0. This new version (which has a street price around $100), lands somewhere between the cheap hobbyist sequencers found in computer superstores and more professional packages costing hundred of dollars. Its features include digital audio support, notational printing, and a Piano Roll view.

The Studio 4.0 package includes versions for Windows 3.1 and Windows 95 (it also runs on Windows NT) on 3.5-inch floppy disks and CD-ROM. The CD-ROM contains a bonus library of 163 MIDI song files and a handful of sound effects. According to its packaging, system requirements are minimal — minimum 386 with 4 MB RAM — although its web site specifies 8 MB RAM.

Studio 4.0 can create MIDI sequences in standard musical notation, piano roll, or with an external MIDI keyboard in both real or step time. Each song can have thousands of MIDI tracks, limited only by your PC's memory and your own amazing arranging talent. Each separate MIDI track can have lyrics added to it. The program supports two tracks of stereo digital audio (one track of stereo if you're using Windows 3.1) so you can add vocals, acoustic instruments, sound effects, or your favorite hog calls to your sequence. Midisoft includes a copy of its Audio Works Wave Editor for tweaking and shaping the WAV files.

GETTING INTERFACIAL

The main window is the standard musical notation window (Score View). The default screen pairs it with a Mixer View where you can adjust volume and solo, mute, and pan tracks. This view also houses the chorus and reverb controls, which function only if your sound card supports them. You can easily change instrument assign-

EQ LAB REPORT

MANUFACTURER: Midisoft, P.O. Box 1000, Bellevue, WA 98009. Tel: 206-391-3422.

APPLICATION: Low-priced PC MIDI sequencing software (with WAV file support) for Windows 3.1, 95, and NT.

STRENGTHS: Inexpensive; supports digital audio files; Wave Editor is easy to use and has effective editing capabilities; most controls easy to find and use; Piano Roll view; multiple windows for editing MIDI and sequence details; prints notation with lyrics.

WEAKNESSES: Poor customer support; adding notes manually is very touchy; Wave Editor has poor sound processing, inflexible controls, and destructive editing; limited undo capabilities; cannot label individual WAV files; inadequate zoom abilities; cannot program time signature or tempo changes in mid-song.

PRICE: $199

EQ FREE LIT. #: 138

AD INDEX

For fast and easy information use the reader response card in this issue

PAGE	BRAND	INFO#	PHONE#
36	Aardvark	01	313-665-8899
107	Acoustic Science Corp.	84	503-343-9727
67	AdB International	02	404-623-1410
2, 87	Alesis	03, 04	800-5-ALESIS
53	Amek	05	818-508-9788
31	Aphex	07	818-767-2929
113	Applied Research & Technology	08	716-436-2720
58	Ashly Audio, Inc.	15	716-544-5191
119	Audix	10	800-966-8261
48	Azden Corporation	09	516-328-7500
132-135	B&H Photo	18	212-807-7474
70, 65	BBE	12, 91	714-897-6766
41	Behringer	11	516-364-2244
128	Bell Electronics	13	903-784-3215
71	beyerdynamic	14	800-293-4463
14	Caig Laboratories	81	714-897-6766
29	Cakewalk	16	617-926-2480
72	Conneaut Audio Devices	17	800-762-9266
10	Countryman Associates	80	415-364-9988
83	Crown	19	219-294-8200
101	dbx	27	801-568-7660
26-27	Digidesign	26	415-842-7900
91	Digital Audio Labs	20	612-473-7626
35	DigiTech	29	801-566-8800
108-109	Disc Makers	32	800-468-9353
45	Discount Distributors	21	516-563-8326
99	DOD Electronics	22	801-566-8800
63	E-mu Systems	30	408-438-1921
129	Earthdisc	23	800-876-5950
75	Electro-Voice	31	616-695-6831
128	Empire Records	90	716-871-3475
69	Ensoniq	24	215-647-3930
129	Europadisk	25	212-226-4401
15, 81	Event Electronics	35, 36	805-962-6926
100	Five Towns College	83	516-424-7000
7	Focusrite	28	516-249-3662
73	Full Compass	92	800-356-5844
105	Furman Sound	33	415-927-1225
128	Geoffrey Daking & Co.	34	302-658-7003
36	Grandma's Music & Sound	82	800-444-5252
131	Illbruck	96	800-662-0032
145	Innovative Quality Software	37	702-435-9077
128	International Audio	38	708-734-1695
148	JBL Professional	XX	818-895-8190
127	Kurzweil	39	310-926-3200
42, 43	Lexicon	XX, 41	617-736-0300
16-17	Mackie Designs	53	206-487-4333
116	Manny's Mailbox Music	42	212-819-0576
112	Markertek Video Supply	43	800-522-2025
129	Martin Audio Duplication	44	800-553-8906
128	Microboards	45	800-646-8881
10	Musician's Friend	46	503-772-5173
147	Neumann	58	203-434-5220
139	Oasis	96	800-697-5734
56	Optofile	47	905-469-8080
47	Panasonic	XX	800-777-1146
25	Peavey	48	601-483-5365
120	Prism Sound	49	908-747-7272
144	Pro Sound & Stage Lighting	50	800-672-4128
51	Q-Sound	51	415-842-7600
37	QSC	66	714-754-6175
9	Quantegy	06	415-367-2149
49	Rane Corporation	52	206-355-6000
107	Rhythm City	54	404-320-7253
128	Ridge Runner Products	89	800-FRET-PRO
95	Rockford/Hafler	65	800-366-1619
116	Rocksonics	55	714-229-0840
57	Roland	56	213-685-5141
123	Samick	86	818-964-4700
97	Samson Pro Audio	57	516-364-2244
11	Sony	XX	800-635-SONY
45	Sound Deals	59	800-822-6434
61, 113	Soundcraft	87, 72	818-893-4351
3	Soundcraft	60	818-893-4351
89	Spirit by Soundcraft	61	818-909-4500
85	Steinberg	74	818-993-4091
77	Studiomaster	62	714-841-4227
125	Sweetwater Sound	93	219-432-8176
121	Symetrix	87	800-288-8855
5	TC Electronic	76	805-373-1828
55	Tannoy America	88	519-745-1158
20-21, 22-23, 13	TASCAM/TEAC America	63, 64, 77	213-726-0303
103	TDK	85	516-625-0100
44	The Recording Workshop	67	614-663-2544
32-33	TL Audio	68	905-420-3946
93	Vega	94	818-442-0782
117	Vestax Corporation	95	707-427-1920
96	Waves	69	423-588-9307
100	West L.A. Music	70	310-477-1945
12	Whirlwind	71	716-663-8820
44	Whisper Room	72	615-585-5827
129	World Records Group	73	800-463-9493
39	Yamaha Pro Audio	75	714-522-9011
82	Yorkville	78	716-297-2920
104	Z Systems	79	352-371-0990

48th Street at your doorstep

Jimi Hendrix to **the Stones**, to **Blues Traveler**, Manny's has been a home to legends for over 60 years. Ordering your gear from Manny's Mailbox Catalog offers **you** the same unparalleled customer service, selection, and expertise you expect from Manny's. It's like having 48th Street at your doorstep. Call **212-869-5172** or write for your free product catalog today - and become part of —The Legend.

Manny's Mailbox Music

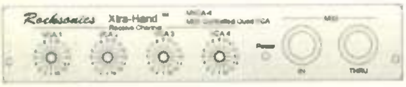
48th Street at Your Doorstep • 156 West 48th Street • New York, NY 10036

Prices and product support available 10 am - 6 pm est, Monday through Friday only.

CIRCLE 42 ON FREE INFO CARD

AUTOMATED MIXING $269

Xtra-Hand™ MVCA-4
MIDI Controlled Quad VCA



Use MIDI continuous controller #1 (modulation) and #7 (volume) as well as note-on commands from any MIDI sequencer, drum machine, expression pedal, etc. to control up to four independent audio levels. With nominal -10dBV unbalanced 1/4" ins/outs, the MVCA-4 can be patched into existing mixer channel inserts, guitar amps, etc. The Hi-Z inputs will not load down or color Hi-Z tube amplifier effects loops. Half-rack chassis can be rack mounted with optional RK-2 dual adapter.

For MIDI automated mixing or remote control of audio via MIDI

Contact your nearest Pro-Audio Dealer or:

Rocksonics
P.O. Box 442
Los Alamitos, CA 90720
Phone/FAX (714) 901-9238

CIRCLE 55 ON FREE INFO CARD

ments for each track with just a few mouse clicks.

The MIDI List View shows MIDI data as actual MIDI messages. You can enter or edit each note, including pitch bend, velocity, duration, and program change. A Studio Panel View provides a window for editing tracks, including patch, volume, velocity, MIDI functions, and looping. Unfortunately, looping is done only one track at a time, which is rather time consuming when looping an entire arrangement.

The Piano Roll View, which is new to version 4.0, provides a friendly interface for entering notes. It's especially useful for programming percussion ensembles and drums. This view uses a grid to display note pitch, duration, and velocity. The grid shows information for only one track at a time, but selecting new tracks from a list box is quick and easy. For those of us who are notationally challenged, this is less intimidating than Score View.

To create sequences in either Score View or Piano Roll, you choose notes from a toolbar and then simply click where you want to place your note. Adding these notes in Score View requires a very steady hand, as it is very touchy and it is quite easy to misplace the note. A zoom feature would be helpful here, although you may modify the number of measures seen in Score View.

The inclusion of digital audio is welcome, but has several limitations. Score View provides no method to differentiate between WAV files once they are placed; a labeling option would be helpful. The Wave Editor is quite effective at cutting, pasting, cropping, and reversing audio files, although the signal processing leaves something to be desired. For example, attempting to use the Hiss function to remove hiss reduced the volume of the audio and actually seemed to add hiss. Applying the Equalizer function caused some very amusical crackles. The program offers only a single level of undo in editing, and saves the added edits directly to the original WAV file.

Moving the WAV files simply involves clicking and dragging the file with the mouse. Sometimes placing your file may take several tries — there are no provisions for precise control placement within the sequence.

INSTALLATION & SUPPORT (SORT OF)

Installation went smoothly on two test PCs (a 486 with Windows 3.1 and a Pentium with Windows 95). Both versions follow a fairly standard Windows interface, so most controls were easy to find and use. General sequencer use was easy to figure out, but more advanced options regularly sent us back to the manual. Online help was adequate except for the Wave Editor, whose help file was mysteriously missing. Midisoft offers telephone tech support only from 8:00 AM to 5:00 PM PST, Monday through Friday. For most people, these are the hours you won't be home to call, and, also, we were dismayed at the lack of service. Phone calls to technical support went to an answering service and weren't returned for four days. E-mail to the company went unanswered.

THE BOTTOM LINE (OF CODE)

This package offers a relatively complete selection of functions for the price. Windows 95 users might be particularly interested since many music software programs are written for Windows 3.1 and may not run reliably on 95. Also the ability to have two tracks of digital audio instead of one is a nice bonus. However, as the included Wave Editor has limited functions, you might prefer to use a separate program such as CoolEdit, an inexpensive and excellent shareware program.

Although Studio 4.0 does improve on the hobbyist level packages, it lacks one important feature — upgradability. You can upgrade Cakewalk Home, which costs about the same, to Cakewalk Pro Audio for a reduced price. If you require a professional software package, save your pennies until you can afford the real thing. Otherwise, Studio 4.0 is worth considering if you are on a budget but want digital audio with your sequencing.

—Ken Lee and Deborah D.K. Gerber (special thanks to Jon Gillespie for his 486 and additional input)

Vestax

The Choice of Professionals–Hard Disk Recording from Vestax.

I couldn't believe how clear, fat and musical my first playback sounded. I am in the process of designing a portable studio based on the Vestax. —Tony Visconti

Foreigner records with whatever we want. For my home studio I chose Vestax! —Bruce Turgeon

These HDR units are cost effective, functional, stand alone hard disc recorders. ...these HDR units are the ultimate satellites for any system! -- Ronnie Montrose

Rick Wakeman with his HDR-6

Vestax Musical Electronics Corp.
2870 Cordelia Road, Suite 100
Fairfield, CA 94585
(707) 427-1920 FAX: (707) 427-2023

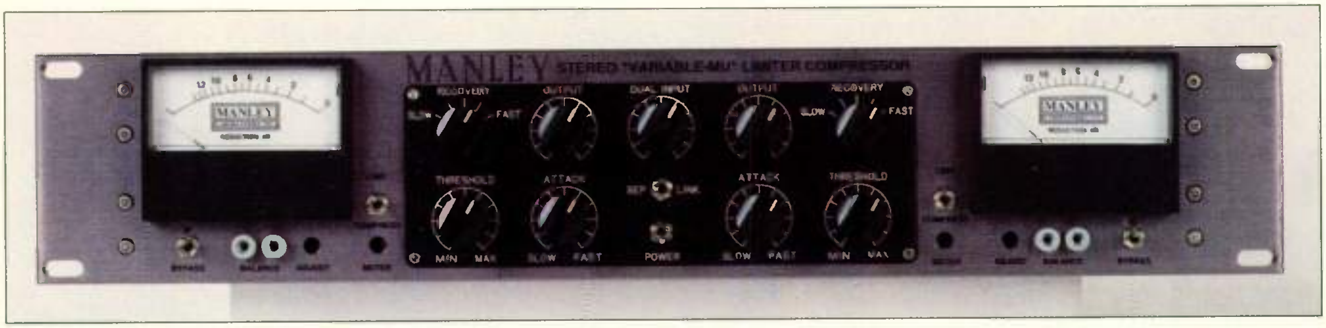
3:15:24
1 2 3 4 5 6
Vestax
HDR-6

Welcome to the new standard of digital hard disk recording. The HDR series digital recorders give you up to 8 tracks of pure digital audio with 1Gb of memory. Working as complete, stand alone, digital work stations, the HDR Series offer multitrack, editing and fully blown mix down features in a single two space rack mount system. The internal digital mixer has three band EQ with mid sweep on the six channel HDR-6 and two band fully parametric on the eight channel HDR-8. The digital mixer is totally midi accessible, allowing you to automate your mixes with either our own software (free to all HDR owners), or most computer sequencer programs on the market. If you need to expand, any number of HDR-6 or HDR-8's can be synchronized with only the supplied optical cable. The optical connection also sends the digital master from one machine to another, for all digital mixing between units. With room for two internal hard drives, 18 bit A to D and 20 bit D to A, the sonic quality of the HDR series cannot be beaten. For remote recording, the portable mixer controller MX-1 controls the HDR Series parameters for digital mixing, transport controls and record track arming through MIDI connections. The MX-1 allows dedicated control of level, pan, record arming, mute, AUX send, AUX master, EQ and pre-EQ level for each channel. For up to 32 track recording on location, four HDR Series recorders can be controlled by one MX-1. For added functionality, expansion boards are available to allow analog recording input, SMPTE time code syncronization, on-board digital effects, and SCSI interface. Move up to the new new standard of digital audio with these cutting edge, all-in-one products from Vestax Musical Electronics Corporation!

Vestax

CIRCLE 95 ON FREE INFO CARD

WRH



Manley Variable-Mu Comp/ Lim

NOT EVERYONE SUBSCRIBES to the theory that tubes intrinsically create better sound, but there are tube-based devices that can provide subtle but distinct enhancement of the sound quality. If you want to prove the point for a skeptic, pass audio through the Manley Stereo "Variable Mu" compressor-limiter. Even if the signal doesn't reach the compression threshold, there is an unmistakable difference that this unit imparts to the audio.

The Manley unit certainly lives up to the expectation of vintage audio gear, with one exception: the signal-to-noise ratio is very up-to-date. This unit has none of the modern interest in milliseconds and dB, and is designed to be adjusted entirely by ear. The control ranges are all marked with simply Slow and Fast or Min and Max. There is even lots of room for China marker lines to "store" your favorite settings. Add a bit of dust and the "Variable Mu" will appear to have been in your rack for decades.

This comp-limiter provides significant input gain and lots of output capability, so the user can use the input and output levels for make-up gain, tube overdrive effects, or driving method used in this unit to perform gain reduction (compression). In tube technology, the term "Mu" is used to describe the amplification factor or gain of a tube circuit. In this case, the gain changes to provide the compression function and sets it apart from some other classic compressors, such as the UREI LA-2, which used a photocell and varied the brightness of a light bulb for gain reduction. The "Variable Mu" approach offers a very smooth form of compression that adds the slightest edge to the signal instead of smothering it like many compressors do.

Since the "Variable Mu" has very well-behaved overload characteristics, the addition of even harmonics begins very gently. The metering is only for gain reduction; therefore, the user must observe the levels on other equipment to ensure that they are not being driven into clipping. Intended as a stereo unit, the "Variable Mu" input level is a single control for both channels. Optional dual-mono or M-S stereo versions are also available. A switch allows the user to select between independent (SEP) or coupled (LINK) sidechains and the Attack, Recovery (Release), Threshold, and Output Level are independently adjustable on each channel with mirror-image controls. There are access holes through the front panel to allow the gain-reduction meters to be "zeroed" and for balancing the DC voltage preset for the 6386 triode tubes that provide the variable gain used for compression/limiting in the "Variable Mu."

The gain-reduction ratio can be switched between 2:1 (compression) and 20:1 (limiting) and the release time can be switched in five steps: 0.5, 1, 2, 4, and 8 seconds. The input and output level controls offer full attenuation and up to +30 dB of gain above unity. The combination of significant input gain and lots of output attenuation provide the user with the ability to set very low thresholds for compression where required. Switching the release time may produce low-level clicks (not a control you normally adjust with the tape rolling), but a few rotations of the knob will charge up the little capacitors in the circuit and thereafter the switch is quiet for a good while.

The smoothness of the "Variable Mu" gain reduction lets you add more compression than with many common VCA-based units without the loss of clarity or attack. The user simply listens to the output while adjusting the

EQ LAB REPORT

MANUFACTURER: Manley Laboratories, Inc., 13880 Magnolia Ave., Chino, CA 91710. Tel: 909-627-4256.

APPLICATIONS: Stereo compression or limiting of mixes, vocals, or instruments where subtle enhancement and gain-reduction are required.

SUMMARY: Offers all of the best attributes of a classic tube compressor, yet quiet enough to be at home in the modern recording chain.

STRENGTHS: Smooth compression that lacks ugly artifacts and adds warmth and sheen; controls remain musical throughout range.

WEAKNESSES: All those tubes create lots of heat; no technoid control labels; needs to warm up for a while before use.

PRICE: $4000

EQ FREE LIT. #: 139

WRH

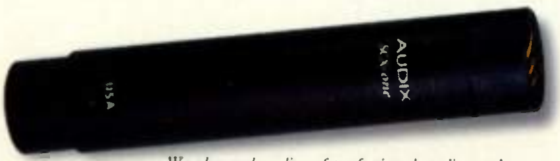
AUDIX
D1
USA
AUDIX
D2
USA
AUDIX
D3
USA

Miking your kit is as easy as D1, D2, D3.

Getting your kit to sound great takes effort – we believe that miking it shouldn't. That's why we've created the Audix **D-Series**. Designed for the serious percussionist, each microphone has unique sonic qualities. It's this uniqueness that insures you'll capture all the snap, sizzle, crash and bottom end your kit has to offer – miking with Audix is as easy as **D1, D2, D3**.

Unlike some mics that rely on neodymium magnets for high output, the **D-Series** uses VLM™ (Very Low Mass) technology. An Audix exclusive, VLM is created with a super strong, yet very thin and lightweight diaphragm. The lightness allows quicker response to acoustic impulses for unequalled levels of resolution as well as the ability to handle huge SPL's.

The **D1** is ideally suited for snare and smaller high pitched toms. The noise rejecting hypercardioid polar pattern and naturally enhanced presence peak enables the **D1** to compliment percussion and mallet instruments.



We also make a line of professional studio condensers. With interchangeable capsules, different polar patterns, and extremely flat frequency response – the SCX-1 is ideal for overheads and studio recording.

Because of added warmth to the low end, the **D2** is perfect for use on low toms and kick drum. The hypercardioid pattern greatly reduces the chance of feedback during live performance while allowing the lower frequencies to punch through.

The ultra linear frequency response and greater dynamic range of the **D3** make it the perfect choice for use in the studio where every nuance of the drums is critical. Extremely compact, the **D3's** uncolored sound can handle sharp transients without clipping.

All of the **D-Series** are built for the road as well as the studio. A rugged e-coat finish, durable gold XLR connector and precision tooling milled from a single piece of aluminum put the **D-Series** in a class of their own.

Don't buy a mic without trying an Audix.

AUDIX®

For more information call, 1.800.966.8261 ext. 123

Web Address - http://www.audixusa.com

© Audix Corporation 1998. All rights reserved. Audix, the Audix logo, D-Series, D1, D2, D3 and SCX-1 are trademarks of Audix Corporation. All other trademarks are the property of their respective owners. Corporate Headquarters, 9730 SW Hillman Court, Suite 620, Wilsonville, OR 97070 USA. Corporate Sales FAX 714.588.8172

Circle 10 on free info card

Attack controls until sufficient transients are passed to maintain the integrity of the music. Vocals can have considerable limiting added without sounding mushy or distant. Sustain is easy to add to guitars, and the "tube sound" is a definite bonus for tracking.

The transformer-balanced inputs and outputs use XLR connectors for each channel and are placed at the extreme edge of the left and right sides of rear panel (talk about stereo separation!). The detachable IEC power cord placed near the middle is the only external indication this is not a 30-year-old device.

The case of the review unit included early production tubes (GE 12BH7) that were tall enough to need "UPS relief" holes to prevent the tubes from being cracked during shipping. Later units use a shorter format of tube that negates these two somewhat crude holes. In addition to one of the above tubes, there is a 12AX7A, 12AL5, and 6386 in each channel. The construction is not that of a device intended for the touring road show, and users should always check that the tubes are seated securely after transport. The internal construction clearly shows the unit to be hand-built in small quantities. The large PC board traces and sharply defined wiring give the overall effect of a unit unchanged over the past 30 years.

The on-board control ranges are restricted to settings that favor music over brute force. While imparting a warm sheen to the sound, the "Variable Mu" reduces the dynamic range without intruding on the music. It is possible, of course, when compressing a full-stereo mix, using fast attack and recovery in the Limit mode, to force the unit to make pumping sounds. However, this is more difficult to do with this unit than most compressor/limiters.

Clearly designed to work as a mastering processor, the Manley unit is also very forgiving of extreme program peaks, while also providing significant gain when required. A special Mastering Version ($5000) is available that includes Grayhill mil-spec gold contact switches instead of the high-quality pots in the review version. This will suit any application where the user must keep accurate note of settings and be able to reset controls exactly.

This is a compressor that can be set for modest gain-reduction of an overall mix and impart a little extra warmth and richness while providing a little overall loudness to the music. If you feel that you are recording your music at the limits of quality possible with your digital multitrack, the Manley stereo compressor-limiter might be the final touch you need to create your ultimate 2-track master. *—Wade McGregor*

TASCAM DA-88
MR-2024T 20/24-BIT INTERFACE ADAPTOR
TRACK MODE
DI ERRORS
SYNC MODE

MR-2024T
16, 20 or 24-bit *multi-track* recording with TASCAM DA-88

- 8-TRACK COMPATIBLE
- 6-TRACK 20-BIT
- 4-TRACK 24-BIT
- 96KHz 24-BIT STEREO

100% IF-88AE COMPATIBLE AES DIGITAL INTERFACE WITH ADDITIONAL 6-TRACK, 20-BIT AND 4-TRACK 24-BIT MODES

RECORD 96KHz 24-BIT STEREO USING 1 AES BEARER PER AUDIO CHANNEL

NEARLY 2 HOURS PER TAPE

PRISM SOUND
WILLIAM JAMES HOUSE, COWLEY ROAD, CAMBRIDGE, CB4 4WX. UK
TEL: +44 (0)1223 424988 FAX: +44 (0)1223 425023

Prism Sound

CIRCLE 49 ON FREE INFO CARD

The 528E Voice Processor

Ten years ago
we introduced the
first Voice Processor
to the professional
audio industry.

Been there, done that.

Today,
we give you the
528E - an input channel
that needs no mixer.

It's the *only* gear
you need between
your microphone
and your recorder.

Mic Preamp

Direct coupled, discrete front-end, ultra-low noise. Warm, yet transparent. The best mic pre you'll never hear.

Downward Expander

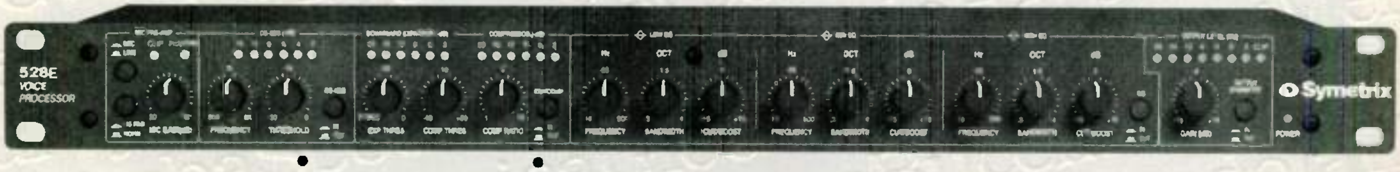
Smooth and seamless. The "smart gate" that won't chop-off the start or end of notes.

Metering

Three dedicated gain reduction meters for "at-a-glance" monitoring.

Parametric EQ

Three-band, state-variable, sweet-sounding, and fully parametric. You'd pay big bucks for a console with EQ this flexible.



De-Esser

Frequency-variable dynamic sibilance reduction. Essential for that "in your face" vocal sound.

Compressor

Ultra-smooth, soft-knee dynamics control. Interactive release time circuitry automatically tracks program peaks to eliminate pumping and breathing.

Rear Panel

Jacks provide direct access to individual processing modules. Use patch cords to change module order or use each on a completely separate audio signal.

And it's not just
for voices.

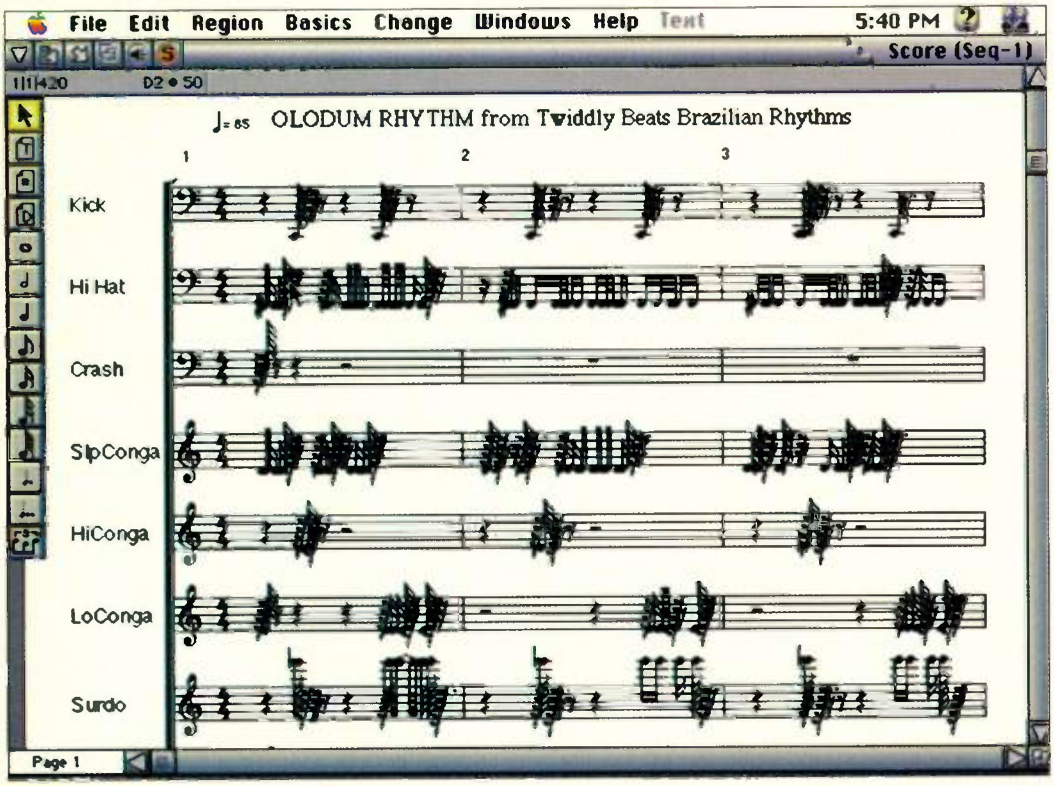
Hear for yourself.

Symetrix

Lynnwood, WA, USA
Phone (800) 288-8855/(206) 787-3222
email 102102.1126@compuserve.com

CIRCLE 87 ON FREE INFO CARD

Twiddly.bits By Keyfax Software



Twiddly.bits from Keyfax Software fills an important and yet neglected area of the MIDI market; namely, instrument-specific MIDI tracks that include all the subtle nuances of live players.

ALTHOUGH MIDI IS a very mature technology, it still hasn't been fully exploited. For example, Twiddly.bits from Keyfax Software fills an important and yet neglected area of the MIDI market; namely, instrument-specific MIDI tracks that include all the subtle nuances of live players.

Twiddly.bits are, in fact, short licks, runs, bends...well, you know, "twiddly bits" of music that you can cut, copy, paste, transpose, tempo-adjust and otherwise use to liven up a programmed sequence. Several libraries are available, including: "Electric & Acoustic Guitar," "Drums & "Percussion," "Country," and "Brazilian Rhythms," with many more on the way. Special MIDI controllers such as the Zeta Violin system, Roland guitar synth, Yamaha WX7 wind controller, and Kat drum kits were used to record the bits. The files are not quantized. By using the right MIDI controllers and authentic musicians to play the parts, Twiddly.bits sound as real as MIDI has ever sounded.

Twiddly.bits Volume Five is a 3.5-inch floppy, formatted for Mac, MS-DOS, or Roland S-MRC format with SMF format files and GM mapping of, believe it or not, country music. The instrument categories are banjo, bass, drums, fiddle, guitar, harp, pedal steel, and piano. The parts were recorded by Scott Joss (Dwight Yoakam); Steve Hackett; Fender consultant Bill Purse (Joe Pass); Andy Shillito (Joe Walker); Johnny Evans (Wild Turkey); Milton MacDonald (Robert Palmer); and Jon Savannah (Van Morrison, Squeeze).

The Twiddly.beats World Series Volume One features Brazilian rhythms recorded by Alfredo Dias Gomes (one of Brazil's top drummers) and produced by Richard Court (Brazilian singing star "Ritchie") on a 3.5-inch floppy formatted for MS-DOS or Mac. These were recorded with a Dynacord Trigger-to-MIDI interface from a Piezo-bugged acoustic drum kit and a Roland Octapad PAD 80.

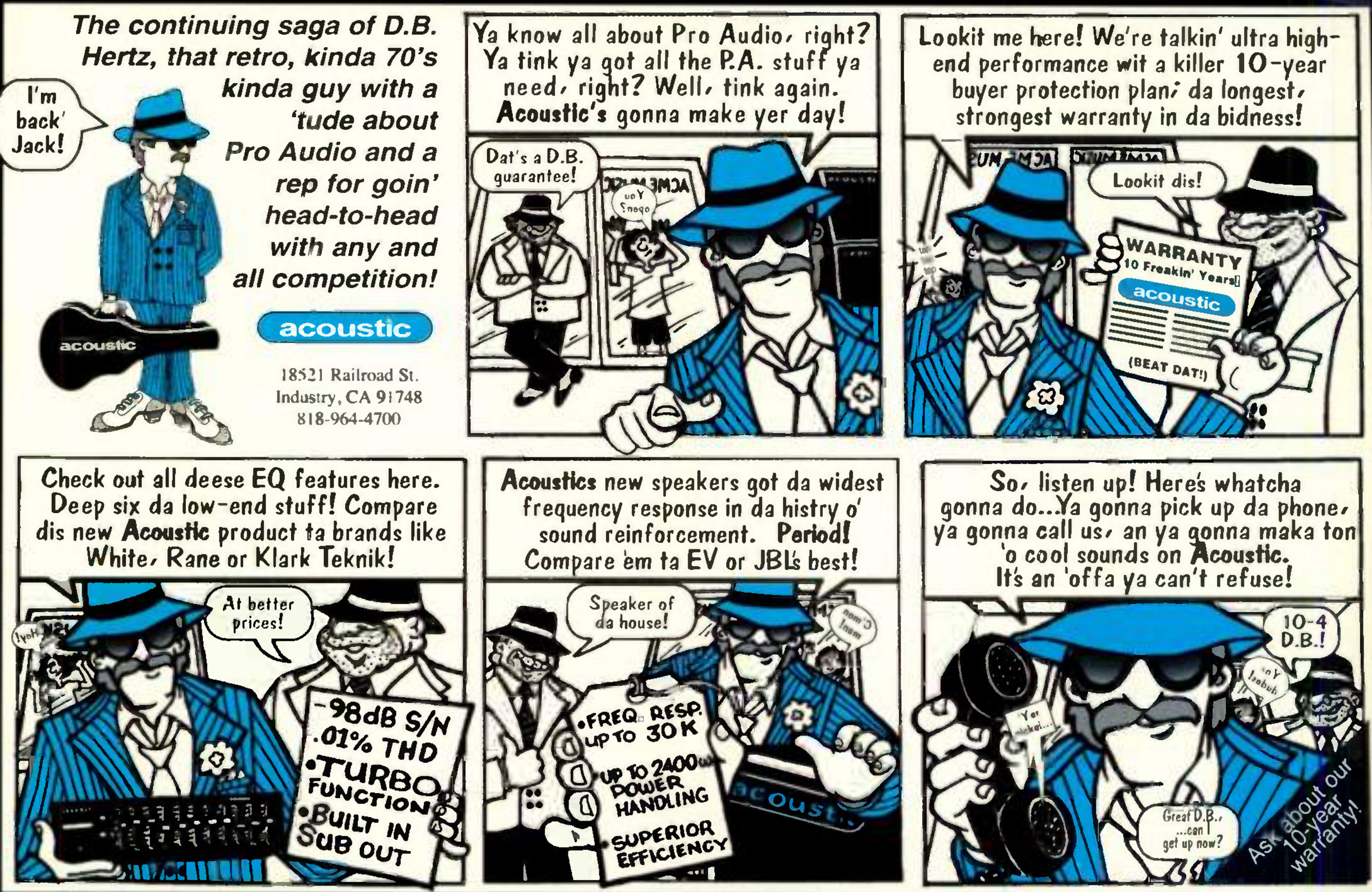
How real and useful are Twiddly.bits? Well, as an experiment I quantized/turned off the velocity of some of the files, and the life gets sucked right out of the music. If, however, you don't like to cut and paste, then Twiddly.bits might not be for you. But if you compose with a sequencer, especially if you need to write in many styles, you will find Twiddly.bits to be a useful, educational, and fun addition to your MIDI tool kit.

—Tona Ohama

Twiddly.bits: Volume Five: Country, $34.95; Volume One: Brazilian Rhythms, $34.95. Contact: Keyfax Software, P.O. Box 958, Aptos, CA 95001-0958. Tel: 408-688-4505; 408-689-0102. Circle EQ free lit. #140.

acoustic
-12 -9 -6 -3 0 +3 +6 +9 +12
dB
TURBO
EQ
OUT
31.5 40 50 63 80 100 125 160 200 250 315 400 630 800 1K 1.25K 1.6K 2K

Speakers, sub woofers, signal processors and more!


I'm back' Jack!
acoustic
Ya know all about Pro Audio, right? Ya tink ya got all the P.A. stuff ya need, right? Well, tink again. Acoustic's gonna make yer day!
Dat's a D.B. guarantee!
Lookit me here! We're talkin' ultra high-end performance wit a killer 10-year buyer protection plan; da longest, strongest warranty in da bidness!
Lookit dis!
WARRANTY
10 Freakin' Years!
acoustic
(BEAT DAT!)
Check out all deese EQ features here. Deep six da low-end stuff! Compare dis new Acoustic product ta brands like White, Rane or Klark Teknik!
At better prices!
-98dB S/N
.01% THD
•TURBO FUNCTION
•BUILT IN SUB OUT
Acoustics new speakers got da widest frequency response in da histry o' sound reinforcement. Period! Compare 'em ta EV or JBL's best!
Speaker of da house!
•FREQ. RESP. UP TO 30 K
•UP TO 2400w POWER HANDLING
•SUPERIOR EFFICIENCY
acoustic
So, listen up! Here's whatcha gonna do...Ya gonna pick up da phone, ya gonna call us, an ya gonna maka ton 'o cool sounds on Acoustic. It's an 'offa ya can't refuse!
10-4 D.B.!
Great D.B., ...can I get up now?
Ask about our 10-year warranty!

The continuing saga of D.B. Hertz, that retro, kinda 70's kinda guy with a 'tude about Pro Audio and a rep for goin' head-to-head with any and all competition!

acoustic

18521 Railroad St.
Industry, CA 91748
818-964-4700

White® is a trademark of White instruments, Rane® is a trademark of Rane Corp., Klark Teknik® is a trademark of Mark IV Pro Audio, EV® is a trademark of Electro Voice (a Mark IV company), JBL® is a trademark of Harman International. (An don'tcha fergit it!)

acoustic

Sound Reinforcement You Can't Refuse™

18521 Railroad St., City of Industry, CA 91748 818-964-4700

CIRCLE 86 ON FREE INFO CARD

INS/ OUTS OF VCAS

continued from page 72

simply because the input channel under control feeds the postfader send.

What does this mean in English? Here's a clear example. Let's say the drum kit has eight toms and you decide to control them with a VCA. Suppose you are using a postfader send from those channels to get the toms into a reverb unit. When you raise the VCA fader, all of those toms get louder, but the signal at the postfader send also gets louder. This is good news, because as you move the VCA fader to make the toms louder or softer, the postfader send will track the VCA and the balance between the dry and the reverb stays the same even when you make changes at the VCA. If those same toms were assigned to an audio subgroup, changing the level of the subgroup fader would *not* change the postfader send to any effects.

TOO GOOD TO BE TRUE

The bad news about a VCA is that since it is a control signal and not an audio signal, you cannot meter it. So you are driving in the dark. This is why consoles also have audio subgroups. The audio subgroup is simply a "y" valve, downstream from the channel fader. The sub collects the audio signals prior to dumping them into the main L/R bus. Audio subgroups have their own assignment to L/R, so a subgroup does not necessarily have to be dumped to L/R. Why do this? Because you can meter the audio subgroup. If you assign channels to the audio subs for metering (not for grouping) you can mix off the VCAs and meter off the audio subs.

The other bad news about a VCA is that you cannot patch across it. But you can patch across an audio subgroup. You might want to group the toms to an audio sub and then patch a gate across the subgroup insert. This lets you do the job with less gates and maintain a more ambient tom sound. Or you can use the audio subs to patch compression across your effect returns. For Ozzy's vocal effects, I route all of the effect returns to a pair of subs and then patch compression across the inserts of the subs.

Other uses of audio subgroups include the linking of two consoles together — most commonly the linking of the support act to the headline act's console. There are many ways this can be done. One is by taking the stereo output of the support desk and patching it to a pair of audio subgroup insert returns in the headline console. Another way is by taking the stereo output of the support desk and directly connecting it into the stereo "sub input" of the headline desk. Again, you can use a 1 kHz tone to establish proper gain structure for both consoles. Keep in mind that a lot of audio purists don't like to use the audio subs because they add more stages of amplification to the signal path and can compromise the signal-to-noise ratio or the dynamic range.

Audio subgroups are also useful for recording purposes. A Yamaha PM4000 has eight XLR audio subgroup outputs on the rear panel that could be connected to an 8-track recorder. Or you can use these outputs as eight additional effect sends.

Let's say that two acts are on a bill and the headliner's engineer needs all eight effect sends. But the opener's engineer has his own rack and wants to connect his gear. Patch the eight audio subgroup outputs to the inputs of his outboard gear. Now the subs function as sends and you have a total of 16 sends. The patching can be done prior to the show. The headline's engineer can even test his effect units for routing during the opener's show.

Remember that just because audio is routed to a send doesn't mean that the effect return is routed to the L/R bus. So you can mess with the send and not affect the L/R main mix. Another idea is to use the audio subgroups to feed a matrix. Maybe you need a vocal fill for a lawn system at a shed date: Do your mix using the VCAs, send the vocals to a subgroup, and assign the subgroup to a matrix output. Send the matrix output to a set of lawn fill speakers. When you mix off the VCAs, the level of the channel faders changes, so the level to the L/R mix also changes. Since the channels are also assigned to a subgroup, the level into the sub changes. The sub is routed to a matrix which is routed to the lawn fill, so by changing the VCA, you are changing the mix on the lawn!

Greg Price has been in the audio business for 19 years. He has worked with everyone from Glenn Campbell to Poison, with acts like Steve Miller, Boston, and Huey Lewis and the News in between. He is currently out with Ozzy Osbourne's "Retirement Sucks Tour." For a closer look at this tour, see Greg's article in the Jan. '96 issue.

WEBSTER THEATER

continued from page 76

is extra noise added to each mix. These modules are getting their power supply from the 7001, which eliminates some of the noise right off the bat. They are compact, quick to connect, and (by changing a resistor or two) I can easily adjust the crossover point. If necessary, we can even use an Octal unit with CD (constant directivity) horn equalization.

FINE TUNING

We are still tweaking the room, getting it tighter every time we do a show here. Even though the ceiling and walls are staggered (which helps break up some reflections), we will put up some room treatment to diffuse the sound and break up the waves. It's like any big room — there's no system made to cure that — so we plan to hang some baffles to stop the sound from hitting the walls and picking up more speed.

It's hard to explain to people who don't understand sound, but it's sort of like skipping a rock on the water. If the water is calm and smooth, the rock will skip on forever, but if there are waves, the rock will stop much more quickly. If you have a room where the walls are smooth as glass and there is nothing to break up the sound, then it is going to bounce for a while. I'd also like to deaden the stage, the walls surrounding the stage and maybe even the ceiling to contain the volume.

When the room is full it tightens up considerably, and even with 1300 to 1400 people here we weren't anywhere near the clip point — so the amps are working out well. If it's a reggae act, we will bring in more low end or if it's a real loud band, they might want to bring in a more high-powered near-fill than the JF100's. But, generally, the room is well-covered. By having the 850's here, the house system doesn't have to be removed for a guest system.

We found that if you put in a good front end and solid electrical service, there are less problems. We have cam-lock distribution right at the AC service panel, so if a road show comes in with their own monitors, they can connect into the cam-lock for distro and we don't have to hire an electrician. There's also a 200 amp and three-phase service for lighting, cam-locked, and ready to go.

We have some big acts coming in here and we want the Webster to be a great place to play. **EQ**

WRH

ADD UP THE VALUE!

1 THE MOST KNOWLEDGEABLE SALES STAFF IN THE INDUSTRY

2 BUY WITH CONFIDENCE: IF YOU'RE NOT HAPPY, WE'RE NOT HAPPY!

3 OUTSTANDING TECHNICAL SUPPORT

4 DEPENDABLE ON-TIME DELIVERY

5 AFFORDABLE PRICES

6 CUSTOM FINANCING PROGRAMS TO FIT EVERY INDIVIDUAL NEED

7 STATE-OF-THE-ART SERVICE DEPARTMENT

8 HUGE IN-STOCK INVENTORY

9 LATEST INDUSTRY NEWS VIA INTERNET AND NEWSLETTER

SWEET NOTES
THE NEW KORG TRINITY

ADD IT ALL UP

Over 100,000 customers around the world already call Sweetwater! Shouldn't you be one of them?

ARE YOU KIDDING? Of course I want a FREE subscription to Sweetwater's exclusive **SWEET NOTES** newsletter!

NAME____________________

ADDRESS____________________

CITY__________ STATE_____ ZIP______

PHONE (   )________________

Be sure to print real tiny since we didn't leave you much room.

WE STOCK THOUSANDS OF PRODUCTS FROM THE BEST NAMES IN THE MUSIC BUSINESS!

Roland
AUDIOMEDIA III

MAKE "THE RIGHT CALL" FOR ALL YOUR MUSIC NEEDS

(219) 432-8176

5335 BASS ROAD • FT. WAYNE, IN 46808 • FAX 219•432•1758
sales@sweetwater.com http://www.sweetwater.com

VISA MasterCard DISCOVER

CALL NOW! YOU MAY BE **PRE-APPROVED** FOR A $10,000 LINE OF CREDIT ACCOUNT!

THE ULTIMATE MUSIC RETAILER!

Sweetwater SOUND INC.

CIRCLE 93 ON FREE INFO CARD

CREST CENTURY VX

continued from page 92

tail off nicely, but any extraneous noises or talking to the audience will not be effected.

The master section of the console has the eight audio group masters located above the VCA group masters, and at the top of these modules are the sends and masters to the eight matrix outputs. The matrix includes sends from the audio groups; left/right masters or external stereo program inputs; mono master; and external mono matrix input. The audio group fader and matrix master knob can be swapped to suit the needs of a production and the eight group VU meters can be individually switched to read the matrix output level.

The comprehensive provision for left/center/right panning on the mono and stereo inputs, in addition to the audio groups, makes the Vx well suited to larger venues where this form of panning provides the best localization effects for the audience. Stereo inputs include a Width Control for varying the inputs between stereo, mono, and inverted stereo, but in L/C/R mode the Width Control continuously varies the stereo signal from left/right (stereo) through to center (mono), providing a blend of separation suited to a particular sound source.

There are comprehensive assignments for the on-board oscillator and pink-noise generator, including all of the auxiliary sends and master outputs. This assignment is shared with the talkback output and there also are Talkback-Enable buttons on each matrix master output. Plus, there are stereo aux inputs assignable to the left/right and mono masters. The Stereo Program In includes 2-band EQ, stereo aux sends (all eight in pairs), in addition to left/right/mono assignment and switchable input to the matrix.

An Alt Main output provides a second level control for sending the left/right signal to a delay stack or DAT recorder. Headphone and nearfield monitoring are also well covered. The narrow module width and small assignment buttons may be a bit tricky for those with large fingers. Thankfully, the Mute and Solo buttons are not only distinct and separated from other buttons, they are also large and easy to hit.

The outputs of the console and primary internal busses are fully balanced, making this a quiet console even in more hostile EMI environments. The 14-gauge steel chassis and individual module faceplates make this a heavy console (the 32-input review unit weighed over 230 lbs.), but also make the unit very rigid and durable. The end-cheeks include hand-holds that allow a secure and relatively comfortable grip when hoisting the unit onto a mix stand. An optional Y-Link can connect the VCA groups, mute groups, and solo functions and link the left, right, and mono busses when a second Vx console is required. The very robust power supply is built like a Crest amplifier. The power supply design includes a simple cable jumper to connect two supplies in parallel for those that require an additional level of security (knowing they have an online backup for the hardest working part of the console).

The Crest Century Vx is not a do-all mixing console. There are, for example, no special modes for monitor mixing or multitrack recording. This is a console clearly focused on the needs of FOH mixing in the theater or live-music venue. This focus has produced a console that brings new possibilities into the grasp of live-sound engineers, and may well spur greater use of left/center/right loudspeaker configurations. Anyone in need of sophisticated mixing control for clubs, theaters, churches, and music halls may now have the console they've been waiting for.

QSC POWERLIGHT

continued from page 96

connected to a suitably stiff AC power service to reach its full potential.

Interestingly, however, the PowerLight design provides better performance than conventional power supply designs when the AC power is less than adequate. The bridged-mono mode completely disconnects the input to Channel 2, thereby sidestepping the need to set the controls to match, or being fooled by inappropriate signals interaction (such as polarity reversal) if the inputs were summed.

In reducing the weight of its new amplifiers, QSC has also increased the overall efficiency of the units. The PowerLight 4.0 produces less heat-per-watt and more total output power than any of its predecessors. The accessory input modules have been replaced with a new series of external signal processing products and full computer control. The amp connects to the processing or computer-control system using a Data Port [15-pin sub-D, or HD, connector] that carries operating status and audio between the external processor or computer and the PowerLight series of amps.

QSC is building a very interesting range of products (such as the MSP CM16 control monitoring processor, MSP AD8 audio drive processor, and MSP SD8/16 speaker drive processor in the MSP series of multichannel DSP processors, and QSControl2 computer control) for processing signals prior to amplification and that access the PowerLight 4.0 Data Port to allow a solid integration of the processing with the active status of the amplifier.

The QSC PowerLight 4.0 will not only make your most demanding amplification tasks less work to move from venue to venue, it will allow you to expand your system capability with computer control and digital signal processing as your needs grow.

TECHNOMAD NOHO C

continued from page 104

(one on each side) and D-rings for overhead suspension. The stand mounts are configured to allow multiple units to stack and splay — a format of arraying that is well suited to the conical dispersion of the coaxial device. The D-rings serve to suspend the units from overhead rigging, but are not easy to use in precisely locating the loudspeakers in a complex array for which other loudspeakers are more suitable.

The Noho C is designed to be an extremely versatile and portable loudspeaker. The touring model includes large, well-placed handles on each end that make the 48 lbs. (21.8 kg) units relatively easy to carry. The two input connectors (NL4MPR Speakon) are paralleled to provide a pass-through to another loudspeaker. This is one speaker well suited to club use, and you can even load-out in the rain without panic. The weather-resistant packaging will allow you to do that one-off in the park and not have to throw trash bags over your loudspeakers at the first sight of clouds. In fact, the Noho C will be rocking out tunes long after your most dedicated fans have run for cover.

WRH

KURZWEIL

PC88

THE HOTTEST THING UNDER THE SUN IS ALSO THE COOLEST

1995 TEC AWARD WINNER!!

THE WORLD'S FINEST
PROFESSIONAL DIGITAL PIANO KEYBOARD CONTROLLER

KURZWEIL
Music Systems

THE BEST JUST KEEPS GETTING BETTER!

VISIT OUR WEB SITE AT www.youngchang.com/kurzweil E-mail at kurzweil@aol.com

Kurzweil Music Systems, 13336 Alondra Blvd., Cerritos, CA 90703 Tel: 310-926-3200 Fax: 310-404-0748
Young Chang (Piano) Canada Corp., 395 Cochrane Drive, Markham, Ontario L3R 9R5 Tel: 905-513-6240 Fax: 905-513-9445

CIRCLE 39 ON FREE INFO CARD

WRH

EQ SHOPPER

Sound Advice

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

Hear It For Yourself

- •Two 52270 Vertical MicPre/EQ's 4 space road case & power supply ..$2595.00
- •Two 52270 Horizontal Mic Pre/EQ's 19" rack mount with power supply .$2495.00

Geoffrey Daking & Co. Inc.
2401 Pennsylvania Ave. Suite 914
Wilmington, Delaware 19806
800-522-3650
302-658-7003
GeoffDake @ AOL.COM

American Express® Cards Welcome

CIRCLE 34 ON INFO CARD

---

all pro audio

Since 1968

GIANT
INVENTORY
BEST PRICES
CALL NOW

Order 1 800 785 3099
Info 1 903 784 3215
Fax 1 903 785 2844

A Division of Bell Electronics

CIRCLE 13 ON INFO CARD

RIDGE RUNNER'S SLO-MO *ENCORE II* 8-SPEED DIGITAL MUSIC STUDY RECORDER

ONE OF A KIND DIGITAL RECORDER MADE JUST FOR LEARNING MUSIC

★ NO PITCH CHANGE OR OCTAVE DROP ★ FREEZE NOTE SUSTAINS ANY NOTE ★ BACK TRACK MODE ★ AUTO REPEAT WILL REPEAT CONTINUOUSLY
★ EASY EDITING OF LICKS TO 1/4 SECOND ACCURACY
★ FULL MINUTE OF RECORDING
★ LEARN NOTE BY NOTE WITH FOOT SWITCH AT ANY SPEED
★ HEADPHONES OR LINE OUT
★ 3 TIMES SLOWER THAN HALF SPEED
★ PITCH CONTROL ★ NO MOTORS
★ 1 YEAR WARRANTY: PARTS & LABOR

"steal" pros' secret speed licks!

★Price: $699.95 ppd.★

ACT NOW! ORDER BY PHONE!
1-800-FRET PRO, or 512-847-8605
VISA, MASTER, AMEX, DISCOVER

RIDGE RUNNER
DEPT. EQ-101
84 YORK CREEK DRIVE
DRIFTWOOD, TEXAS 78619

CIRCLE 89 ON INFO CARD

Empire Records

1000 CDs
$2375

Includes: CDR, 70 min. CD, 20 tracks, 2 color disc, full layout, color separations, full color 4-page insert, full color tray card, jewel box, assembly, and shrinkwrap. Free shipping included! Ask about our cassette packages.

Call toll free for free brochure & sample
1-800-305-DISC
Fax: (716) 871-9317
2635 Delaware Ave. Buffalo, NY 14216

We accept Mastercard & Visa

CIRCLE 38 ON INFO CARD

TDK PRO SA

C10.....$.29
C20.....$.35
C30.....$.41
C45.....$.47
C60.....$.58
C90.....$.75

- ***CD REPLICATION***
- ***REAL TIME CASSETTES***
- ***CD ONE-OFFS***
- ***COMPLETE PACKAGES!!***
- ***MAKIN' COPIES SINCE 1974!***

International Audio
847-734-1695

VISA MasterCard DISCOVER

CIRCLE 90 ON INFO CARD

CD-Recordable Technology for the Audio Professional

Your Single Source for Blank CD-R Media

Microboards is the Master Distributor of ALEA CD-R Duplication Stations

Featuring: PlayWrite 2X, 4X CD-R Systems (supported by MasterList CD) bundled with *Red Roaster* editing software.

Red Roaster is the first windows based package that edits PQ subcodes, and sets index/track numbers, pause, start time and emphasis.

Four-Color Graphics on Your CD-R

MICROBOARDS of AMERICA
1-800-646-8881
Fax: 612 470 1805

CIRCLE 45 ON INFO CARD

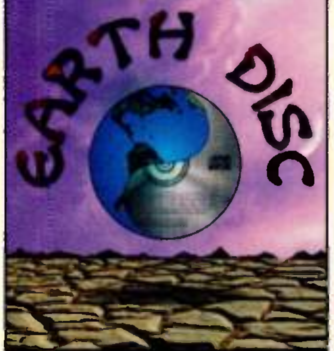
EQ SHOPPER

CD & Cassette Prices That Are Down To Earth!

CD Packages Include:
- Glass Master
- Full Color 4 Panel Booklet
- 2 Color on CD Printing
- Shrink Wrap
- Jewelbox
- And Much More . . .

CD's	CASSETTES
500 - $1070	500 - $555
1000 - $1635	1000 - $745

MASTERING
at $55/hr.



Toll Free
1-800-876-5950
We Accept VISA/AmEx

CIRCLE 23 ON INFO CARD

CD - CASSETTE - VINYL LPs

All Manufacturing in Our Plant... Since 1977

CD & CD-ROM REPLICATION

Disk Price (Bulk)		Set-Up Cost vs Turn-Around-Days			
Quantity	Price Ea.	3 DAYS	5 DAYS	10 DAYS	15 DAYS
200 to 499	$.95	$1,100	$850	$500	$450
500 to 999	.90	1,000	775	375	350
1,000 to 1,999	.80	900	625	200	100
2,000 to 4,999	.72	725	250	no charge	
5,000 to 25,000	.65	no charge		no charge	

From your Premastered CD-R, replicated CD or 1630 and label film. Prices include 2-color CD label (1-color on 999 or less). Premastering & Packaging are available. **Jewel Case & Shrink-Wrap Packaging, $.28; $.25 @ 5,000 & over.**

RETAIL-READY CD PACKAGES with Full Color Graphics

CDs in Jewel Case + Full Color Booklet and Tray Card

	300	500	1,000	2,000	5,000
1-Panel	$1,627	$1,748	$1,903	$2,893	$5,943
4-Panel	$1,957	$2,078	$2,233	$3,353	$6,643
6-Panel	$2,387	$2,508	$2,663	$3,873	$7,093

Includes graphics layout, typesetting, graphics proofs, film and printing for booklet, tray card and 2-color CD label (1-color for 999 or less), replication and packaging in shrink-wrapped jewel case -from your sketch, photos and premastered CD-R.

NEED CD-AUDIO PREMASTERING?

DAT to Sonic Solutions PMCD Master Disk + Reference Disk for your approval: $125 to 25 minutes; $140 to 63 minutes; $150 to 74 minutes

RETAIL-READY CASSETTES with Full Color Graphics

Full-Color Standard J-Card, Norelco Box - CHROME!	500	1,000	2,000	3,000	5,000
to 12 Min.	$720	$1,004	$1,588	$2,090	$2,974
13 - 29 Min.	$750	$1,071	$1,714	$2,267	$3,247
30 - 49 Min.	$791	$1,148	$1,865	$2,478	$3,575
Full-Color O-Card Cassette Single - CHROME!					
to 12 Min.	$715	$935	$1,394	$1,918	$2,600
to 29 Min.	$740	$979	$1,476	$2,033	$2,778

Includes graphics layout, typesetting, graphics proofs, film, graphics printing, shell printing, test cassette, and shrink-wrapping - from your sketch, photos and master.

VINYL RECORD PACKAGES

	300	500	1,000	2,000
12" Single (to 14 Min.)	$795	$1,015	$1,285	$2,195
12" LP (to 26 Min.)	$895	$1,115	$1,385	$2,295

Includes Direct Metal Mastering, Plating, Test Pressings, Label Typesetting, Label Printing (1 ink color), all-plastic sleeve, collation & cartoning in 50-count boxes. Black Die-cut (hole-in-the-middle) Jackets - 35¢ each.

EUROPADISK, LTD.

Call for our COMPLETE CATALOG (800) 455-8555

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

CIRCLE 25 ON INFO CARD

SATISFACTION 100% GUARANTEED

COMPACT DISCS
INCLUDES GLASS MASTER/
SET UP, 2 COLOR CD IMPRINT.
FULL COLOR 2 PAGE CD BOOK
& TRAY CARD, PACKAGING

500	$1295
1000	$1795

1000 C 45 DIGITAL CASSETTES
WITH FULL COLOR J-CARD
$995

All prices based upon production ready DAT and plate-ready film. Freight charges may be additional.

MARTIN AUDIO DUPLICATION

1219 Westlake Ave. N. Suite 218-A, Seattle WA 98109
(206) 285-2642
1-(800) 553-8906

CIRCLE 44 ON INFO CARD

CD REPLICATION
CASSETTES
Custom Mastering

Complete Graphic Design
Printing & Packaging

WORLD RECORDS GROUP
BUYER'S GUIDE

Priority Service
MAJOR RELEASE QUALITY
Since 1969

WORLD
Call for
your FREE
full color
Buyer's Guide

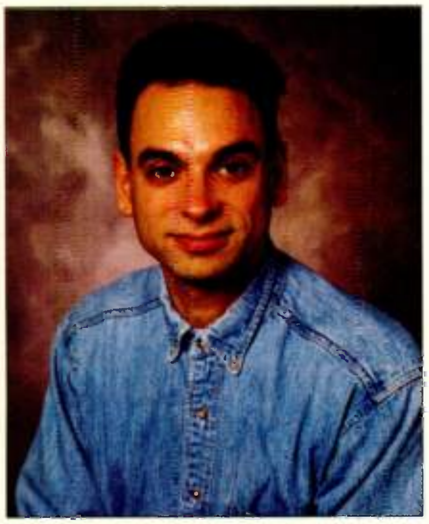
1-800-463-9493
24 HOUR TOLL FREE Outside North America 905-433-0250

CIRCLE 73 ON INFO CARD

Wanted: Dead Or Alive

The secrets to getting great audio at live shows

BY EDDIE CILETTI



My treasure map for the Holy Grail of Great Audio — live or recorded — is not a list of America's Most Wanted Gear. The bottom line of getting great audio is not always the sexiest, most expensive gear. It is about talent, communication, and honesty with one's self. We can create at workstations to our heart's content, but to get up on a stage and make some, hopefully, pleasant noise requires a group effort. Here are the secrets borne from great mistakes, a.k.a., the mother of invention.

THE HOLY GRAIL

- Musicianship
- Arrangement
- Dynamics

Surprised? You shouldn't be. If the goal is air, space, punch, warmth, depth — whatever you call it — great audio is really about sonic real estate. Here's an example: From spring to fall in NYC, I have been known to slip on a pair of roller skates and make the trip from the East Village to Central Park. The first two things I encounter in the Park are fresher air and more space. This has a most positive affect on my brain.

My favorite treat is to hear the assortment of music that "grows" in the park. This ranges from acoustic guitar and voice, to drums and dancers, to four-piece ensembles. The latter typically consist of traps, acoustic bass, guitar, and a reed or brass device. Amplifiers are battery-powered, so nothing can be too loud, but what does come through is pure musicianship.

Real magic occurs when the bassist takes a solo. What impresses me most is how all the other players show respect and go pianissimo. This is much different than pulling down a fader or even turning down an amp because playing lighter radically changes harmonic content. Simplified parts create more space and serve to redirect attention toward the action — an acoustic bass through a *Mouse* amplifier. With no stage and nothing to contain the sound, the power is in what's been taken away!

For engineers of both live and recorded sound, the challenges of more formal settings are formidable. The secrets to success are:

- A nonadversarial relationship between engineer and band
- Low-powered amps (guitars: 15 to 30 watts; keyboards: 30 to 60 watts; bass: 60 to 120 watts)
- Preproduction
- Record rehearsals and live performances
- Open with a clever gimmick

A positive relationship between the soundperson and the musicians is a plus. The ability to verbally communicate — in social, sonic, and musical terms — is essential. To start, consider working with low-powered guitar amps such as the Fender Deluxe, Vox AC-30, or the Mesa Studio .22. Once the ear adjusts to high sound pressure levels there's no turning back. Be good to your ears by leaving plenty of headroom.

The time spent in preproduction, before a gig or recording, is worth thousands of dollars per hour. Since it's easy to create a sonic traffic jam, concentrate your efforts on what happens during vocals, especially verses. Verses require rhythmic and low-end support from drums and bass. Keyboard and guitar parts can accent the rhythm or fill in the space provided by vocal phrasing, but should not be in the way of the vocal. Vocal performance will improve with space. If you can't hear yourself [singing], there is too much going on.

HOW MUCH POWER?

The *suggested* output power is just that. Guitar amps are likely to be overdriven, so their output will seem louder even with less power. Bass requires more power because more air must be moved. Keyboard rigs fall in between. Unless distortion is part of the sound, the additional power is for headroom.

From my experience, the audience always thinks the soundperson is at fault if the vocals can't be heard or if the band is too loud. Nothing could be further from the truth. It may be a psychologically difficult hurdle, but using the same small amps — live or in the studio — will leave more space for engineering creativity and ultimately help to get your point across. Moderate stage levels will dramatically improve the performance of the monitors and the house system. In the studio, this translates into less leakage and more natural room ambiance. Did I mention that it also makes it easier to sing?

One test for excessive volume I discovered quite by accident. I was in the habit of closing my ear-flaps with finger pressure in order to hear better. In addition to improved clarity, what I noticed was an upward change of pitch. If you try this with the same results, *the music really is too loud.* Later, I confirmed this theory while reading *The Audio Cyclopedia*. It states that the ear's sensitivity not only varies with frequency (hence the Fletcher-

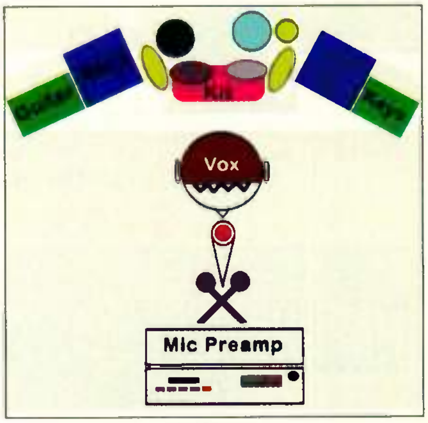


FIGURE 1

Munson Loudness curve), but also that the perception of pitch varies with excessive levels. This is one of the reasons vocalists sing consistently flat.

RECORDING: DAT OR CASSETTE?

Stereo recordings of rehearsals and live performances will provide major clues about how the band must internally mix itself. Rather than rely on the cassette deck supplied by the rehearsal facility, choose to commit your recording to DAT so that no one can use the poorer-sounding cassette as an excuse. For accurate proof, try the following recording tricks.

1. **Recording Rehearsals:** Place two identical microphones in an X-Y mechanical configuration, not more than six inches behind the lead vocalist's PA microphone (see the drawing in fig. 1). Record directly to stereo tape and take frequent breaks to listen either in headphones (preferred), in another room on a stereo system, or through the PA. It's not only possible to achieve a balance this way, it is also possible to get an exceptional recording.

2. **Recording Performances:** Live gigs have a way of pumping the ego into uncontrollable excess. Big hair, big amps, big lights, (hopefully) big audience, big equipment changes, big supposed record company attendance, and big space. These combined ingredients usually equal big disappointment. For more humiliating proof for the person who was way-too-loud, route the house mixer output to one channel of your tape deck. On the other channel, place a microphone at the soundperson's mixing position — fed through a preamp or an impedance-matching transformer (Radio Shack Part # 274-016) as shown in fig. 2.

This style of recording will demonstrate the difference between what is being fed to the house versus what is directly thundering from the stage. Bass players, for example, EQ their signal so that they can hear that very lowest octave. While distance attenuates high frequencies, it has a way of exaggerating the opposite end of the spectrum. If budget and time permit the use of both a wireless connection and a soundcheck, have the bassist walk around the venue while playing. EQ to taste.

My goal is to have the recordings — rather than my incessant blabbering — convince the band to play with dynamics. The small amp concept is for discipline. Perfecting this method will yield great results at gigs where only the vocals are going through the PA. At larger venues, all amps can be miked and sent through the monitors. No one should be so loud as to not require support from the monitoring system. Soundpersons should pay special attention to signal polarity, especially with bass. It is important that the phase of both house and monitors match the signal coming from the stage, otherwise there will be areas where low-frequency information is missing.

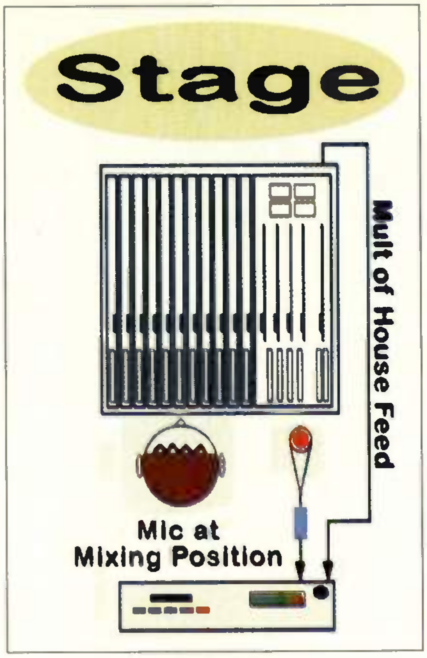


FIGURE 2

Since guitars and vocals are competing for the same frequency spectrum, perhaps the most amount of professional courtesy should be extended to the latter from the former. Guitarists like their amps on the floor because this extends the low-frequency response. This height also corresponds to a whole section of the audience who does not receive the benefit of the soundperson's mix. Guitar amps should be at the player's ear level. This will force players to turn down both level and treble.

Opening acts do not often get soundchecks, but there is a way around this, too. One possibility is to open with a stripped-down instrumental. Start with one or two instruments, adding one more instrument after each chorus. This gives the house engineer time to get a mix and the audience time to settle down while the band gets acquainted with the room. Add vocals at the end and voila! You're ready to rock the house.

SONEXgraphics™ Acoustic Treatments

Now, any photo, scenic, logo or illustration can be reproduced in full color on FIBER-FREE, Class 1 SONEX acoustic panels. Instead of having to choose between wall decor or acoustic treatment, you can have both. Your creative interior design and acoustic applications are limitless. Call today!

illbruck
1-800-662-0032

CIRCLE 96 ON FREE INFO CARD

B&H
PHOTO - VIDEO - PRO AUDIO

"THE PROFESSIONAL'S SOURCE . . .

FOR ORDERS CALL:
800-947-5518
212-444-6688

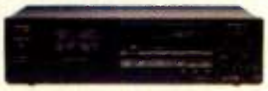
OR FAX (24 HOURS):
800-947-9003
212-444-5001

OVERNIGHT AND RUSH SERVICE AVAILABLE

E-Mail at 76623.570@compuserve.com

TASCAM

102 mkII / 103
Stereo Mixdown Cassette Decks



Best values for musicians studio operators and production houses, the 102 mkII and the 103 consistently produce only the higest quality tape recorded output

They Feature:
- 60dB signal-to-noise ratio combines with wide frequency response for high-fidelity sound reproduction using any type of cassette tape
- Industry-standard Dolby B/C noise reduction and Dolby HX Pro sound technology extends high frequency performance up to 6dB and minimizes distortion
- Advanced bias -sensing electronics automatically chooses optimal recording settings for the type of tape you load in—Normal, Metal or Cr02
- Record/Mute autospacer automatically inserts 4 seconds of silence between songs or broadcast segments
- Multi-function display clearly indicates transport mode, tape counter position, tape type and level indicator
- Multi-counter with both tape counter and run-time modes
- Independent L and R stereo level controls and master record level control

Tascam 103 Advanced Features:
- 3-head system allows you to record on a tape and monitor it at the same time without rewinding
- MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction

202 mkIII
Dual Auto Reverse Cassette Deck

The 202 mkIII provides high-fidelity sound reproduction and a wide frequency response, as well as a host of features that help you dub edit, record or playback onto/from one or two cassettes easily and efficiently
- Normal speed and high-speed dubbing
- Autospacer automatically inserts 4 seconds of silence between songs or broadcast segments for pro quality tapes
- Incorporates Dolby HX Pro sound technology to extend high frequency performance and minimize distortion on Mormal, Metal and Cr02 tape
- Allows you to quickly and easily create a professional-sounding composite tape from several sources Functions like Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks you want
- Twin two-head cassette decks in a durable rack-mount housing that can be used separately or in tandem during recording and playback for total flexibility

–***Play*** material on deck 1 while deck 2 records on one or both sides
–***Record*** simultaneously on both decks from an external master
–***Play*** back both sides of one or both decks in a continuous loop, up to five times
–***Auto Reverse*** automatically reverses tape direction during playback and record
–***Repeat*** rewinds tape and allows infinite looping during playback
–***Timer*** switch for unattended record/playback (timer required)

New! 302
Double Auto Reverse Cassette Deck

All the features of the 202 mkIII the new 302 adds even more recording and playback flexibility Thats because the 302 is actually two fully independent cassette decks Both decks have their own set of interface connectors transport control keys and noise reducing functions
- Auto reverse capability on both decks
- Individual/simultaneous record capability–both decks
- Independent RCA unbalanced in/out for each deck
- Cascade and Control I/O let you link up to 10 additional machines for multiple dubbing or long playing record and playback applications

CD-601
Professional CD Player

Frame-accurate cueing precision, extremely high-fidelity and a small form factor make the CD-601 ideal for post-production applications where sound effects and music are "flown-in" from compact discs The CD-601 integrates with most post-production equipment including mixers, video editors and computer studio controllers
- Balanced XLR and unbalanced RCA outputs
- Precision cueing control and Auto cue
- Linear motor-driven pick-ups eliminate dead air
- Optional RC-601 remote control adds additional features and conveniences
- Optional BU-2 RAM for instant start and seamless loops up to three minutes

marantz®

PMD-101/201/221/222/430
Portable Professional Cassette Recorders

The world standard for field recording, the PMD line is also the value leader They all feature RCA line input/outputs 1/4-inch headphone jack, built-in speaker, pause control, audible cue and review, tape counter full auto shut-off and low battery indicator

- All models except the PMD-430 have 1/2 speed playback/record capability With 1/2 speed playback, musicians can slow down complicated passages for analysis. And when played back at 1/2 speed, the pitch is lowered by exactly one octave so the notes are still musically correct—ideal for figuring out complicated solos or picking patterns
- By recording at 1/2 speed, a three hour meeting can be recorded on a single tape A built-in microphone and automatic level control make operation simple, and built-in speaker makes transcription convenient
- 1/2 speed recording is equally ideal for churches, because 90 minutes can be recorded on a single side of tape—no interrupting your recording to flip the tape over Line inputs make it easy to use and connect to your existing sound system
- Three standard 'D' cell batteries provide up to 7-1/2 hours of operation and the optional RB430 rechargeable battery delivers up to 5-1/2 hours

General	PMD-101	PMD-201	PMD-221	PMD-222	PMD-430
Stereo/Mono	Mono	Mono	Mono	Mono	Stereo
Heads	2	2	3	3	3
Inputs/Outputs					
Mic Input	1/4-inch	Miniplug	Miniplug	Mini/XLR	1/4-inch
Condenser Mic	Built-In	Built-In	Built-In	Built-In	—
Remote Jack	—	Yes	Yes	Yes	—
Modular Tel Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR	—	—	—	—	Yes
dbx NR	—	—	—	—	Yes
Mic Attenuation	—	0 -10dB -20dB	0 -10dB -20dB	0,-10dB -20dB	0,-15dB -30dB
Ambient Noise Cont	—	Yes	Yes	Yes	
MPX Filter	—	—	—	—	Yes
Manual Level Control	—	Yes	Yes	Yes	—
Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pitch Control	±20%	±20%	±20%	±20%	±6%
Bias Fine Adj	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
Half-Speed Playback	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

Telex

ACC2000/4000 Series Cassette Duplicators

Designed for high performance and high production, Telex's ACC Series (ACC2000/ACC4000) and (ACC2000 XL/ACC4000 XL) of expandable duplicators also offer easy maintenance and unsurpassed ease of use The ACC2000 is a two -channel monaural duplicator, the ACC4000 is a four-channel stereo duplicator Each produces 3 copies from a cassette master at 16 times normal speed and each can expand up to 27 copy positions (with additional copy modules) With the extra copy modules, you can duplicate up to 27 copies of a C-60 original in less than two minutes And they copy both sides at once The XL Series feature "Extended Life"cassette heads for increased performance and wear characteristics They also offer improvements in wow and flutter frequency response, signal-to-ratio and bias Additionally the ACC4000 XL allows for either chrome or ferric cassette duplication XL- models are available in stereo (ACC4000 XL) or mono (ACC2000 XL) versions

Fingertip Operation
- Individual rotary audio level controls allow for an increase or decrease of audio levels as the master translates to the copies
- Peak reading LED indicators allow quick and accurate monitoring of audio fluctuations
- Side A or A/B select button let you set up for duplication of either 1 side or both sides of a cassette at once
- Stop all tapes instantly, at any point during the copy or rewind cycle
- Short tape indicators alert you if a tape stops before the original does, identifying incomplete copies caused by jam or short
- Automatic or manual selection of rewind and copy operation

–Rewinds tapes to the beginning or end automatically (AUTO mode) or manually
–In AUTO mode the copy button activates the entire rewind copy/rewind sequence In manual it starts copying immediately

Easy Maintenance:
- Slanted work surface and unique "heads-up" cassette platform allow less oxide build up on the heads and makes cassette loading and unloading much easier
- Each cassette position has a three point tape guidance system that eliminates skew problems Plus, when a tape is inserted, each cassette position is activated to prevent unnecessary wear and tear on the tape head mechanism
- Audio and bias along with head adjustments, are made easily from the top of the unit and a switch on the back engages the head and pinch roller for convenient cleaning

ACC2000 Mono MasterModule:
- 1/2 track two-channel monaural duplicator produces 3 copies from a cassette master at 30ips (16X normal speed).
- Expands up to 27 copy positions by adding ACC2000 copy modules (four positions each)
- Erase heads in the copy positions automatically erase existing audio as new material is being recorded
- Track select,short tape indicators,auto/manual operation
- Includes removable power cord and protective dust cover

ACC2000 XL Mono Master Module:
- Same features as ACC2000, ***plus***– Extended Life cassette heads

ACC4000 Stereo Master Module:
- 1/4 track, four-channel stereo duplicator Same features as ACC2000 Mono Master Module/

ACC4000 XL Stereo Master Module:
- All features as ACC4000, ***plus***– Extended Life cassette heads. Can be configured for chrome or ferric cassette duplication

ACC2000 Mono Copy Module:
- 1/2 track, two-channel monaural copy module
- Each module has four copy positions with erase heads and controls for side select
- LED displays indicate end-of -tape status for each pocket
- Includes ribbon cables for connection to ACC2000 master and other copy modules.
- Includes removable power cord and protective dust cover.

ACC2000 XL Mono Copy Module:
- Same features as ACC2000 Copy Module ***plus***–Extended Life cassette heads Connects to ACC2000 XL Master Module

ACC4000 Stereo Copy Module:
- 1/4 track,four-channel copy module Has all the features of the ACC2000 Copy Module

ACC4000 XL Stereo Copy Module:
- Same as the ACC4000Copy Module, ***plus***–Extended Life heads Configurable for chrome or ferric cassette duplication

Copyette EH Series Duplicators

The popular Copyette series produces high quality, low cost cassettes in large quantities at nearly 16 times normal speed This means you can reproduce both sides of a C-60 tape in less than two minutes. Available in two versions,the Copyettes are capable of duplicating either one cassette or three at a time In addition each are available in both mono and stereo models

They couldn't be easier to use.You simply insert the cassettes, press the START switch and they do the rest. They rewind all tapes to the beginning, copy, then rewind to the beginning again before stopping The whole process can be stopped at any time by pressing the CYCLE button Side Select feature allows you to set them up to copy one side of a tape or both sides at once

Stereo Copyette 1•2•1

Weighing only 8 lbs (3.6 kg), this unit has a durable, impact resistant housing and includes a removable power cord, carrying handle and protective cover It also has an optical , non-reflective end-of -tape sensing system that provides gentle tape handling A mono version is also available

Stereo Copyette 1•2•3

This duplicator copies both sides of three cassettes at once, yet it's as small as the 1•2•1 It weighs only 12 pounds (5.4 kg) and includes a hard cover to protect the unit while not in use It uses all DC Servo motors for the ultimate in reliability A mono

TASCAM

112 mkII
Stereo Cassette Deck

The classic "no frills" production workhorse the 112 mk II is a 2-head, cost effective deck for musicians and production studios Extremely rugged and reliable, the 112 mk II is ideal for production mastering and mixdown. It also features a parallel port for external control an and optional balanced connector kit means it is flexible enough to integrate into any production studio
- Utilizes Dolby B or C noise reduction with Dolby HX Pro
- Automatically selects proper bias type, so you get optimal recording & playbank response with Normal, Metal or Cr02 tape
- Gear independent input dials let you dial in stereo VU calibration with one dial You can also adust for channel specific calibration
- Offers two Autolocator buttons and a MEMO IN control. Thes controls allow you to select two points on any tape for one button forward/reverse to wherever the action is Additionally RTZ (return to zero) quickly spools the tape back to 0000 on the tape counter
- Rear-mounted RCA input/output jacks for easy connection to high-quality sources
- Optional LA-112 connector provides addtiional balanced or unbalanced XLR inputs and outputs .Installation is simple and requires no special tools
- 25-pin D sub connector (parallel port) on the back, links the deck to the optional RC-134 remote control unit or for fader start from any mixer that use the same protocol

112R mkII
Bi-Directional Stereo Cassette Deck

The 112R mkII is a sonically uncompromising, auto reversing and continuous play cassette deck It offers the finest independent head auto-reverse design at this price level, plus it has extra dubbing and editing features that make it ideal for long program recording

All the features of the 112 mk II *plus*—
- Three-head transport with separate high-performance record and playback heads Manufactured from resilient Cobalt Amorphous materials, the independently-operating heads combine with precision FG servo direct-drive capstan motors to provide the highest standards of reproduction quality and performance
- Frequency response is 25 Hz to kHz with less than 1% total harmonic distortion
- Equipped with Hysteresis Tension Servo Control (HTSC) the 112R mkIIvirtually eliminates wow and flutter HTSC is an advanced servo control system that maintains consistent back tension on the tape all through the reel, combatting inconsistencies brought on by extreme temperatures and humidity
- Super Accuilgn Rotating Head System allows recording or playback tape direction to be changed with one button A single-screw azimuth adjustment makes it easy to maintain the head alignment after many hours of continuous use
- For unattended record/playback of material that is longer than one side of a tape, there are two features that spare you from constantly attending to the deck

—Auto Reverse mode plays or records in both directions before stopping switching sides on the fly
—Continuous Reverse mode allows you to loop the tape during, layback up to 5 times, or record in both directions, without pausing to flip the tape and re-engage the record mechanism. Bothfeatures are accessible from the front panel, with one-button selection

122R mkIII
3-Head Stereo Cassette Deck

The standard for production and broadcast facilities, the 122 mkIII features smooth faultless tape handling mechanisms, a three head transport with high-performance Cobalt Amorphous record/playback heads and precision servo direct-drive capstan motors

All the features of the 112R mk II (no reverse of course) *plus*—
- XLR balanced and unbalanced RCA inputs and outputs are selectable with the flip of a back-panel switch There are 1/4-inch inputs on the front panel for simple and direct plug-in of line-level gear
- MPX filter button eliminates polot and sub carrier broadcast tones that can interfere with Dolby noise reduction
- Bias and level fine tuning for each channel These tuners can be used in conjunction with the one-touch 400 Hz or 10 kHz oscillator adjustment signals to get proper VU calibration before or during each recording session.
- Record/mute autospacer automatically inserts 4 sec. of silence between songs or broadcast segments for pro quality tapes

SEVEN DAY CUSTOMER SATISFACTION GUARANTEE

CIRCLE 18 ON FREE INFO CARD

. . . FOR PHOTO & VIDEO"

TO INQUIRE ABOUT YOUR ORDER:
800 221-5743 • 212 807-7479
OR **FAX** 24 HOURS: 212 366-3738

119 WEST 17TH STREET, NEW YORK, N.Y. 10011
Store & Mail Order Hours:
Sun 10-4:45 • Mon & Tues 9-6 • Wed & Thurs 9-7:15 • Fri 9-2 • Sat Closed
EQUIPMENT LEASING AVAILABLE

B&H
PHOTO - VIDEO - PRO AUDIO

BEHRINGER

MDX 1200 Autocom

- Attack and release times, with Intelligent Program Detection, prevents common adjustment errors.
- Newly-developed, powerful noise gate.
- Switchable soft knee/hard knee characteristics for varied sound pressure levels.
- Bright, illuminated LEDs show gain reduction.

MDX 2100 Composer

- Integrated auto/manual compressor, expander & peak limiter.
- Compresses "musically" in dynamic range without any audible "pumping" or "breathing".
- Attack & release times are controlled automatically or manually.
- Interactive Gain Control (IGC) combines a clipper and peak limiter for distortion-free limitation on signal peaks.
- Servo-balanced inputs and outputs are switchable between +4dB and -10dB.

ALESIS

3630 Compressor

The 3630 provides two full-featured professional compressor/limiters in one rack space. Ideal for any application from studio recording and mixing to live sound reinforcement and broadcast.

- Dual mono or linkable true stereo operation,
- Choose between RMS and peak compression styles as well as hard knee /soft knee characteristics.
- Dual 12-segment LEDs display gain reduction and input/output levels.
- Each channel's built-in noise gate has an adjustable threshold and close rate to ensure clean, transparent performance.
- Variable attack and release times and a sidechain function for "ducking" in broadcast applications.

t.c.electronic

Wizard M2000

Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and six different routing modes. There are 250 factory programs Including reverb, pitch delay, delay, chorus, flang, phase, ambience, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit analog conversion,AES/EBU and S/PDIF digital inputs/outputs, "Wizard" help menus, 16-bit dithering tools, Tap and MIDI tempo modes and single page parameter editing.

- The array of enhanced pitch shift (up to 8 voices), chorus, and delay effects are characterized by their precision and versatility. Everything from the fine and subtle to the wide and spectacular is handled with equal superiority. The algorithms in the dynamics section (compressor, limiter, expander, gate and de-esser) are unique as stand-alone effects, but are particularly useful in combination with other effects. Those might be de-esser/room, gated hall or compressed pitch. The possibilities are endless.
- Tempo Tap function lets you match effects to the beat. Tempo can be adjusted in beats-per-minute and sub-divided any way you like–even in triplets. The tempo can also be read from MIDI.
- Preset "Gilding" (morphing) function ensures seamless transition between effects. Very useful in live and mixing situations.

Symetrix

601

Digital Voice Processor

- Accepts mic or line level analog signals, converts them to 18 bit-digital and then performs 24-bit digital domain signal processing.
- Processing includes fully parametric/shelving EQ, notch/dynamic filtering de-essing, delay, chorus, gating, expansion, compression, AGC and DC removal.
- Combination of 128 factory presets and 128 non-volatile user programs.
- Has XLR-balanced mic and line inputs, XLR-balanced stereo output. Digital XLR-balanced and S/PDIF (RCA) inputs and outputs. MIDI Input/output supports connection to virtually any type of MIDI control device for programming or controlling the 601 in real time.
- Ideal for a variety of recording, broadcast, live sound, and post production applications.

WE ARE A FULL STOCKING DEALER FOR THE ENTIRE SYMETRIX LINE

FOSTEX

XR-5/XR-7 Multitrackers

XR-5 Features:

- High-speed (3-3/4 ips) four-track (2-tracks simultaneously) recorder with built-in Dolby noise reduction (can be turned off)
- Pitch controller varies the tape speed within a range of ±12%
- Punch in/out function makes corrections and phrase insertions when necessary, can be done easily with optional footswitch.
- Four inputs accommodate two microphones in channels one and two. Has convenient insert points for connecting a compressor/limiter and other devices for the mic channels.
- Each channel is equipped with two-point high/low shelving equalizers to help shape the sound, and an AUX send function for processing anbient system effects.
- Trim function lets you switch High/Mid/Low Input levels for channels one and two.
- Alternate Mix mode lets you independently select the signal from the input jack or the tape playback Prefader effect send, inline monitor & other functions are also possible using this mode.
- Post foldback (monitor) send function routes the foldback signal to the AUX send. When the foldback is activated you can actually mixdown at the same time you add reverb to a tape
- MIDI/TAPE multi-mix mode supports MIDI synchronization. Together with the Alternate Mix mode the XR-5 can simultaniously mix all MIDI sound source output with tape playback sound and effect output while monitoring!

The XR-7 has all the features of the XR-5 ***plus***—

- 6 inputs, plus the ability to record four tracks simultaneously
- Dolby C noise reduction plus dual speed recording
- During recording, Channels 5 and 6 are the primary inputs for microphones and acoustic instruments. They have trim controls and mid-sweep EQ. During mixdown, these channels act as the main stereo L/R bus.
- Auto rehearsal mode let's you concentrate on the music instead of the machine.

TASCAM

PORTA 03 MKII Ministudio

The easiest way to get into multitrack recording, the PORTA 03 is an extremely economical 4-track recorder that lets you overdub as well as mixdown to standard cassettes.

- 4-track recorder with integrated two channel mixer
- Two 1/4-inch MIC/LINE inputs with trim control
- Extended dynamic range with Dolby B noise reduction
- 3-digit tape counter keeps track where you are on the tape
- Master level control for the entire mix, and the level sent to LINE OUT for stereo mixdown
- Track selector indicates which of the 4 tracks you're recording to
- SAFE selection keeps you from inadvertently recording over tracks you've recorded earlier
- Headphone jack for comfortable monitoring
- RCA output jacks for mixdown to cassette

PORTA 07 Ministudio

The PORTA 07 packs high-end features into a compact and economical package. Achieves great sound with high speed tape transport, high-low EQ and DBX noise reduction.

- 4-track recorder with integrated four channel mixer
- Two 1/4-inch LINE inputs and two 1/4-inch MIC/LINE inputs with trim control.
- Separate high and low EQ for each track provides 10dB of boost or cut.
- dbx noise reduction for improved signal-to -noise ratio.
- Punch-in/out r manually or with optional RC-30 footswitch.
- Effects send with stereo return can be applied in varying amounts to all four channels
- "Bounce or "ping pong" a submix of multiple mono or stereo tracks onto a single empty track, leaving the original submix tracks free to overdub new material onto. You can even add a "live" track to the submix while you're bouncing down, to squeeze in yet another track.

424 MKII Portastudio

The 424 is premium Portastudio that takes multitrack recording to the next level. Features superior audio quality, balanced XLR inputs, enhanced equalization and a big-studio style AUX section.

All the features of the PORTA 07 ***plus***—

- 4-track recorder with 8-input mixer (4 mono MIC/LINE Inputs with 1/4-inch and balanced XLR jacks and 2 stereo Inputs with 1/4" jacks)
- Separate 3-band EQ section for each of the four mono channels with 10dB of boost or cut and sweepable midrange.
- Auto Punch in/out with rehearsal, plus a Repeat switch lets you set up a tape loop that goes over the same area of a tape while you practice your punch-in/out and overdub moves—without committing a single note to tape
- Two independent dedicated AUX sends let you use more effects or use one as tape cue during tracking
- Dual-speeds, logic-controlled tape transport system improves tape handling and sound quality. Select 3-3/4 inch per second HIGH speed for the best possible recording quality or NORMAL 1-7/8 ips speed.
- Monitor output makes it easy to connect an external monitor amplifier without repatching—at mixdown.
- Tape DIRECT OUTS are provided for integration with external mixers.

MIDI Musicians Take Note—If you've got MIDI keyboards, drum machines and sound modules in your set up, you can exploit the power of :virtual tracking" with either the PORTA 07 or 424/464/488 Portastudio. You can use a MIDI synchronizer like the Tascam MTS-30 MIDI-Tape Synchronizer to record (stripe) a code onto track 4 (track 8 with the 488). Just select SYNC mode on the DBX switch and record the tone to tape. After striping the tape with FSK or Song Position Pointer information, all your MIDI instruments will faithfully follow the tape during playback and recording, even if you slow or speed the tape ssing the PITCH controls. The big benefit is that your MIDI tracks (called virtual tracks) don't actually have to be recorded until final mixdown, giving you lots more unused tracks to record on.

464 Portastudio

The functionality of a pro recording studio in a small, lightweight package, the 464 Portastudio is a full-featured eight input, four-track cassette recorder complete with a 12x2 internal mixer and dual buss design that lets you create separate recording and cue mixes.

All the features of the 424 MK II ***plus***—

- 4-track recorder with 12-input mixer (4 mono MIC/LINE with 1/4-inch and balanced XLR jacks, 4 stereo 1/4" jack pairs.
- Channels 1-4 offer High and Low shelving EQs and a sweepable Mid EQ. Tracks 5-6 and 6-7 have shelving EQ only, while 9-10 , 11-12 are best used with input that has its own internal EQ..

488 MKII Portastudio

When 4 tracks are just not enough, then you need the perfect creative tool—the 488 MKII Portastudio. The most cost-effective 8-track recorder on the market, the 488 not only offers additional capacity but versatile capability and intuitive operation for easy capturing & manipulation of your ideas. Whether recording acoustic or electronic instruments or vocals, the 488 offers maximum creative freedom to produce your best work. With all the functionality of a professional studio, the 488 may be the ultimate demo recording machine.

All the features of the 464 MK II ***plus***—

- Includes phantom power for use with high-quality condenser microphones..
- Built-in mixer features low-noise circuitry, with 12 inputs and 2 group busses. There is a separate input for your stereo master recorder.
- Each of the 8 main input channels includes individual 3-band equalizers. You get Hi and Low shelving EQs, plus a semi-parametric sweepable midrange EQ.
- Unique multi-mix mode with the capability of handling up to 20 inputs at mixdown.
- The only 8-track cassette that offers a servo controlled tape transport complete with electronic braking. Equipped with a high-performance Hysteresis Tension Servo Controlled (HTSC) tape transport, the 488 delivers better sound than the first 8-track reel-to-reel machines.
- HTSC maintains precise and consistent tape tension from the beginning until the end of the tape.It actually dynamically adjusts the back tension on the tape as it moves from one end to the other, allowing precise locating capability.

ALESIS

Monitor One

Near Field Studio Reference Monitor

Designed by engineers with decades of experience, the award winning Monitor One provides the last critical link in the recording studio's signal chain; giving you an accurate reproduction of what is being recorded.

- Delivers excellent image and transient reproduction, powerful bass, and smooth, extended high frequency detail.
- Exclusive SuperPort speaker venting technology eliminates the "choking" effect of port turbulence for solid high-power bass transients and extended low frequency response.
- Ferrofluid cooled 1" silk-dome driver eliminates the harshness and ear fatigue associated with metal or plastic tweeters, making it easy to mix on for extended periods.
- Monitor One's powerful bass incorporates a proprietary 6.5" low frequency driver with a mineral-filled polypropylene cone and a 1.5" voice coil wound on a high-temperature Kapton former.
- They come in a mirror-image left/right pair covered with a non-slip rubber textured laminate for stable mounting.

Monitor Two

Mid Field Studio Reference Monitor

With much of today's popular music demanding more bass at louder volumes than a small near field monitor can possibly produce—the Monitor Two delivers—at a price no higher than many of these smaller speakers.

- Utilizes a 10" three way speaker design with a unique asymmetrical crossover to maintain the same accurate tonal balance and imaging of the Monitor One—but with a much larger sound field.
- 10" low frequency driver incorporates Alesis' SuperPort speaker technology to provide powerful, extended bass.
- 5" mid frequency driver offers exceptional mid frequency detail
- 1" silk dome high frequency driver delivers a broad but natural frequency response from 40Hz to 18kHz.
- Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy.

TANNOY

PBM Series II

Reference Monitors

The PBM II Series is the Industry standard for reference monitors. They feature advanced technologies such as variable thickness, injection molded cones with nitrite rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected Indicators. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability and most important, real world accuracy

PBM 5 II

- Custom 5" Injection-molded bass driver with a nitrite rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- Woofer blends seamlessly with the ¾" polymide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring.
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density medite for minimal resonance and features an anti-diffraction radiused front baffle design.

PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" lowfrequency driver and 3/4" tweeter are fed by a completely redesigned hardwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radiused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

PBM 8 II

- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors and components available.
- Full cross-braced matrix medite structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities.

SEVEN DAY CUSTOMER SATISFACTION GUARANTEE

CIRCLE 18 ON FREE INFO CARD

WRH

B&H

PHOTO - VIDEO - PRO AUDIO

"THE PROFESSIONAL'S SOURCE . . .

FOR ORDERS CALL:
800-947-5518
212-444-6688

OR FAX (24 HOURS):
800-947-9003
212-444-5001

OVERNIGHT AND RUSH SERVICE AVAILABLE

E-Mail at 76623.570@compuserve.com

CARVER

CA-400/CA-900

Stereo Power Amplifiers

Designed from the ground up for fixed installation applications, the CA-400 and CA-900 are manufactured under the most stringent quality control procedures and are backed up with a full five year warranty covering all parts and labor.

- 3-position barrier strip screw terminal inputs can be used with balanced or unbalanced lines
- Independent CH 1 & CH 2 level controls with 11 detented positions
- Dual mono mode for operating both channels with a single mono input
- Bridged mono mode for combining the power of both channels into a single higher powered channel
- Internally configurable for parallel mono mode, for single channel low impedance operation
- Internal jumpers to bypass Left and Rght Level Controls
- Internal connection points for add-on accessories like the optional Balanced Transformer Kit.
- Independent CH 1 and CH 2 speaker relays will instantaneously disconnect if fault conditions such as over temperature, short circuit or D.C. offset is detected.
- Power Ready, Signal Present and Clip/Protect indicators

CA-400 features 130W per channel into 8 ohms,
200W per channel into 4 ohms

CA-900 features 325W per channel into 8 ohms,
450W per channel into 4 ohms

Stewart

Power Amplifiers

PA-1000
PA-1400
PA-1800

- High frequency switch mode power supply fully charges 120,000 times per second (1000 times faster than most power supplies) requiring far less capacitance for filtering and storage.
- High speed recharging also reduces power supply "sagging" that afflicts other designs
- Incredibly efficient, 5 PA-1000 or PA-1400's (4 PA-1800's) can be run on one standard 20 amp circuit. No need for staggered turn-on configurations or other preventive measures when using multiple amp set-ups
- They produce smooth and uncolored sound, while offering very full detailed low end response and tons of horsepower
- Each amp carries a full 5 year warranty on parts and labor

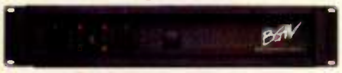
PA-1000 weighs 9 lbs, is 15" deep and occupies one standard rack space. Delivers 1000 watts into 4Ω when bridged to mono

PA-1400 weighs 16 lbs, is 15" deep and takes 2 standard rack spaces. Delivers 1400 watts into 4Ω when bridged to mono.

PA-1800 weighs 17 lbs, is 17" deep and takes two rack spaces. Delivers 1800 watts into 4Ω when bridged to mono

BGW

Performance Series Amplifiers



Performance Series 1
300 Watt Power Amplifier

- Measuring only 3.5 inches high and weighing 26 pounds, the Series 1 delivers more than 150 watts per channel
- Its welded steel chassis is unbelievably strong while a custom heat sink extension provides exceptional thermal capacity
- An internal fan provides quiet background noise levels for critical monitoring applications and when pushed hard the cooling system insures continuous cool operation even in the most demanding situations.
- Active balanced inputs with both XLR and 1/4" phone jacks
- Supplied with quality 5-way binding posts for highly reliable speaker connection.
- Front panel handles are reversible for either rack mount installation or easy handling
- LEDs are provided for signal presence and clip indication, the detented gain controls have large knobs for easy front panel adjustments

Performance Series 2
600-Watt Power Amplifier

- Same as above except the Series 2 weighs 32 pounds and delivers more than 300 watts per channel.

Performance Series 4
1200-Watt Power Amplifier

- Same as above except the Series 4 weighs 53 pounds and delivers more than 600 watts per channel
- Has a switch selectable clipping eliminator that prevents damage to the speakers

SAMSON® MIXPAD 9

Ultra-Compact 9-Channel Audio Mixer

A remarkably compact 9-channel mixer, the MIXPAD 9 offers professional audio performance and a wide range of user-intensive features. It boasts low noise and distortion specifications, includes wide-range gain trim controls for both mic and line inputs and provides exceptionally low group delay over the full frequency bandwidth for a more transparent, open sound. It also has a very high slew rate—usually found only on larger, more expensive mixing consoles—allowing it to react very quickly to transients and maintain a crisp, articulate sound. It offers phantom power (48v) for use with condenser microphones and an in-line power supply eliminates magnetically-induced hum

- 3 mic/line inputs and 3 stereo channels (total 9 inputs)
- 2 auxiliary sends for effects and two Stereo returns
- Independent 2-band shelved EQ, pan control for mono channels and balance control for stereo channels
- Adjustable mic input trims allow use with a wide variety of mics
- Phantom powered XLR mic input connectors
- Peak LEDs for left and right main outputs
- Extremely durable, extruded aluminum chassis

MACKIE.

MICRO SERIES 1202-VLZ

12-Channel Ultra-Compact Mic/Line Mixer

Usually the performance and durability of smaller mixers drops in direct proportion to their price. Fortunately, Mackie's fanatical approach to pro sound engineering has resulted in the Micro Series 1202-VLZ, an affordable small mixer with studio specifications and rugged construction. It delivers no-compromise, non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio stations, broadcast studios and editing suites—where nothing must ever go wrong

- Working S/N ratio of 90dB, distortion below 0.025% across the entire audio spectrum and +28 dB balanced line drivers
- 4 mono channels with discrete, balanced balanced mic/line inputs and 4 stereo channels (12 inputs total)
- Line inputs and outputs work with any line level, from instrument level, to semi-pro -10dB, to professional +4dB
- Switchable phantom-powered (48v) inputs for condenser mics
- Every input channel has a gain control, pan pot, low EQ at 80 Hz, high EQ at 12.5 kHz and two aux sends with 20dB gain
- Master section includes two stereo returns, headphone level control and metering
- Sealed rotary pots resist and other contaminants

NEW! MS1402-VLZ

14 x 2 Compact Mic/Line Mixer

Mackie's fanatical engineers have done it again. Balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room feature. Nice long 60mm faders, six studio-quality mic preamps and extra Alt 3-4 stereo bus—in less than 1.3 square feet of space

- Studio grade mic preamps (chs. 1-6) with high headroom, low noise and phantom power. Also incorporate low cut filters to cut mic handling thumps, pops and wind noise. Lets you safely use low shelving EQ on vocals
- Trim controls (ch. 1-6) with ultra wide range (+10 to -40dB) handle everything from hot digital multitrack feeds to whispering lead singers and older, low output keyboards.
- Pan control with constant loudness and high L/R attenuation so you can pan hard left or right without bleed-through
- Two aux sends per channel with 15dB extra gain above Unity
- 60mm log-taper faders are accurate along their whole length of travel and employ a new long-wearing contact material for longer fader life & uper resistance to dust, smoke etc
- Control room/phone matrix adds incredible tape monitoring, mixdown and live sound versatility
- Mute switch routes channel output to extra ALT 3-4 stereo bus. Use it for feeding multitrack recorder channels, creating a subgroup via controlroom/phones matrix, monitoring a signal before bringing it into the main mix or creating a " mix minus".
- Solid steel chassis instead of aluminum or plastic.

The new MS-1202, 1402 and 1604 all include VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for Mackie's acclaimed 8•Bus console series, VLZ effectively reduces thermal noise and minimizes crosstalk by raising current and decreasing resistance.

NEW! CR-1604 VLZ

16-Channel Mic-Line Mixer

The hands-down choice for major touring groups, studio session players, as well as broadcast and sound contracting. The new CR-1604 VLZ features everything you would expect from a larger console, and then some! 24 usable line inputs with special headroom/ ultra-low noise Unityplus circuitry, seven AUX sends, 3-bandEQ, constant power pan controls, 10-segment LED output metering and discrete front end phantom-powered mic inputs

- Lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range). Many drummers consider it the only mixer capable of handling the attack and transients of acoustic and electronic drums
- Genuine studio-grade phantom powered, balanced input mic preamps on channels 1-6. All CR-1604 VLZ (and optional XLR10 for ten more) discrete input mic preamp stages incorporate four conjugate-pair, large-emitter geometry transistors. So, whether recording nature sound effects or heavy metal, miking flutes or kick drums, you get the quietest, cleanest results possible
- True 4-bus design with channel assigns to 1-2, 3-4 or main L-R.
- 3-band EQ with mid-frequency sweep and low cut switch.
- AFL/PFL solo and mute switches with overload andsignal present indicators.
- Rear panel features include insert points and 1/4-inch /XLR connectors on every channel, as well as RCA tape inputs/outputs
- New, standard size channel trim pots are found at the top of each channel
- Rotary input/output "pod" allowing three different positions for set-up

TASCAM

M2600 MKII Series

16/24/32-Channel 8-Bus Mixers

LOW NOISE CIRCUITRY

- Combining completely redesigned low noise circuitry with Absolute Sound Transparency™ the M-2600 delivers high-quality, extremely clean sound. No matter how many times your signal goes through the M-2600, it won't be colored or altered. The signal remains as close to the original as possible. The only coloring you hear is what you add with creative EQ and your outboard signal processing gear
- Double reinforced grounding system eliminates any hum. World-class power supply provides higher voltage output for better headroom and higher S/N ratio

PREMIUM QUALITY MIC PRE-AMPS

- The M-2600's mic pre-amps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel
- Accepts balanced or unbalanced 1/4" inputs, and low-impedance XLR jacks. Better still, the TRIM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the -20 dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug in anything – keyboards, guitars, basses, active or passive microphones, samplers and more.

THE BEST AUX SECTION IN THE BUSINESS

Versatile AUX section has 8 sends total, 2 in stereo. Send signal in stereo or mono, pre-or post-fader. Available all at once. Return signal through any of 6 stereo paths.

FLEXIBLE EQ SECTION

Bi-directional split EQ means you can use either or both EQ sections in the Monitor or Channel path... or defeat the effect altogether with one bypass button. Other comparably priced mixers will lock the shelving mix into the Monitor path only, limiting your EQ application

ADVANCED SIGNAL ROUTING OPTIONS

Direct channel input switching. Assign to one of eight busses, direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching

ERGONOMIC DESIGN

The M-2600 has a big studio feel. All buttons are tightly spring loaded, lock into place and accomodate even the biggest fingers. The faders and knobs have a tight, smooth "expensive" feel and are easy to see, reach and manipulate. Center detents assure zero positions for EQ and PAN knobs. Smooth long throw 100mm faders glide nicely yet allow you to position them securely without fear of accidentally slipping to another position.

Panasonic.

SV-3800/SV-4100

Professional DAT Recorders

Designed for professional applications, the SV-3800/SV-4100 have highly accurate and reliable transport systems with search speeds up to 400X normal, and 20-bit D/A converters to satisfiy the highest professional expectations both in terms of sound and functionality

SV-3800 Features:

- Recording via analog inputs offers sampling rates of 44.1 or 48kHz. When recording through digital inputs, it automatically clocks to incoming frequencies of 32/44.1 or 48kHz
- XLR-balanced digital inputs/outputs plus consumer format coaxial and optical inputs/outputs. XLR-balanced analog stereo inputs/outputs. Output level is selectable between +4db and -10db. The input level is +4db
- Built-in shuttle wheel has two variable speed ranges. 3 to 15x in Play mode and 1/2 to 3x normal speed in Pause mode
- High speed transport enables searching up to 250x normal speed. Search up to 400x normal speed is possible once the tape has been scanned in Play, FF or REV mode. This ensures access to any point on a two-hour DAT in under 30 seconds
- Ramped record mute and unmute with three seconds fade-in and five seconds fade-out provides automatic level changes at the start and end of a recording
- Comprehensive display includes program numbers, absolute time, program time, remaining time and Table of Contents.

SV-4100 Has all the features of the SV-3800 Plus—:

Offers enhanced performance required for professional production, broadcast and live-sound systems. Features such as instant start, external sync capability and enhanced system diagnostics make the SV-4100 the DAT quality standard

FOSTEX

D-5

Digital Master Recorder

With professional features and a consumer price tag, the D-5 satisfies a lot of requirements. It records or playsback four hours of music, includes optical and digital input/output, and TOC functions that are as easy to use as a CD player. It's also equipped with basic pro features such as ID editing function, GPI and XLR connectors and 300X speed locate and search functions

- Playback/record audio with32/44.1/48 kHz sampling in SP (standard play) mode. Equipped with LP (long play) mode, it can play/record at 32 kHz up to 4 hrs. on a 120 minute cassette
- Analog interface includes switchable (+4dB/-10dB) balanced and unbalanced XLR inputs and outputs
- AES/EBU digital interface (XLR) for professional use and optical (S/PDIF) input/output for consumer/semi-pro connections.
- 5-pin GPI input connector allows, Play, Stop & S-ID search to be implemented through commands from an external source
- Records CD-Q code sync ID, enabling precise music start up. When performing digital signal transfer from CD through it's optical input, the D5 precisely records S-IDs according to the track number and index information of the CD-Q code. So even if there is a break in the middle of a song or there isn't a non-recorded section between two songs, you can locate to the S-ID location (eg. beginning of song) precisely

D-10

Digital Master Recorder

- Switchable 44.1 and 48kHz sampling frequecies
- Analog interface includes switchable XLR-balanced (+4dB) and unbalanced RCA -(10dB) inputs and outputs
- Equipped with and XLR-balanced AES/EBU digital interface and optical (S/PDIF) input/output conforming to IEC consumer
- Built-in 8MB RAM (4 MB x 2) offers instant start as well as scrubbing at 1m/second accuracy.
- Advanced jog/shuttle for precision cueing and monitoring.
- Auto Cue provides automatic locating to the exact start of audio modulation during ID search and tape loading
- Universal GPI input/output enables easy and fast assemble editing, based on A-time between a pair of D-10s
- Switchable 2-position reference level: -12dB/-20dB
- Start and Skip IDs as well as up to 799 P-NOs can be recorded and played back
- 10-digit key-pad lets you store and recall 100 cue points
- Continuous or peak reading level meters can display available headroom with an accuracy of ±0.1dB
- Reads and displays A-time or Pro R-time, also provides PCM monitoring
- Optional 8333 interface card adds timecode and RS-422 (X 2) functionality to the D-10.
  - Reads an external timecode and records on the sub-code area
  - Reproduces and outputs the timecode from sub-code area
  - Switchable RS-422 and ESbus protocols. Using the ESbus, up to 16 D-10s can be daisy chained

SEVEN DAY CUSTOMER SATISFACTION GUARANTEE

CIRCLE 18 ON FREE INFO CARD

. . . FOR PHOTO & VIDEO"

TO INQUIRE ABOUT YOUR ORDER:
800 221-5743 • 212 807-7479
OR **FAX** 24 HOURS: 212 366-3738

119 WEST 17TH STREET, NEW YORK, N.Y. 10011
Store & Mail Order Hours:
Sun 10-4:45 • Mon & Tues 9-6 • Wed & Thurs 9-7:15 • Fri 9-2 • Sat Closed
EQUIPMENT LEASING AVAILABLE

B&H
PHOTO - VIDEO - PRO AUDIO

TASCAM
DA-P1 Portable DAT Recorder

- Rotary two head design and two direct drive motors for the best transport in its class.
- XLR-balanced mic/line inputs (with phantom power) acceptf signal levels from -60dB to +4dB.
- Analog line inputs & outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enable direct digital transfers.
- Uses next generation A/D & D/A converters for amazing quality.
- Supports 32/44.1/48kHz sample rates & SCMS-free recording.
- Included in its design is a MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- TRS jack & level control to monitor sound with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter & 1 battery.

SONY
TCD-D8
DAT Walkman Player/Recorder

- Long Play (LP) mode allows 4 hours of record/playback of 12-bit audio on a single DAT cassette.
- Equipped with digital coaxial and optical input connector. Also has analog Mic and Line inputs.
- High-speed Automatic Music Sensor search function finds & plays tracks, skips forward or back up to 99 tracks, all at 100x normal speed
- Digital Volume Limiter System increases listening comfort & sound quality by automatically adjusting for sudden level changes
- Two-speed cue-review lets you hear sound while player is in fast-wind modes, up to 3x or 25x normal speed.
- LCD display with backlit windows clearly shows recording level, track number, operating status and 4-segment battery indicator, even in low ambient light conditions
- Optional RM-D3K System Adapter Kit for complete digital interface. It has input/output connectors for both the optical cable & the coaxial cable. Also includes a wireless remote control

TCD-D10 PRO II
Portable DAT Recorder

- Has balanced XLR input, switchable mic (-60dB) or line (+4dB) inputs. A 12-pin digital connector provides interfacing with AES/EBU digital signals of 32/44.1/48.0 kHz sampling rates.
- Comprehensive self-diagnostics function constantly monitors the rotation of the head drum, capstan and reels. The tape transport mode and load/unload time are continuously checked as well.
- Up to 99 start IDs can be recorded in the subcode area. When the record button is pressed, the start ID is recorded automatically for 9 seconds. During recording, it can also be added manually to any position of the tape. Search for start IDs is 100X normal speed.
- 20-segment digital peak level meters include overload indicators. Closely tracks input signal for accurate level indications.
- During playback, the date and time of recording is displayed.
- Has a record-level limiter with a fast attack time of 300ms. Mic attenuator prevents distortion by suppressing signal level 20 dB
- Immediate playback is possible through a built in speaker.
- Supplied wired remote controller also accepts a mic holder. Two mic stand screw adapters are also supplied.
- Supplied NP-22H rechargeable battery provides 1.5 hours of operation. Optional NPA-D10 battery adapter enables 1 hour on AA batt. Supplied ACP-88 AC adapter operates on 100-240v 50/60 Hz.

HHb
PORTADAT
PDR1000/PDR1000TC
Professional Portable DAT Recorders

- Direct drive transport with 4 heads for confidence monitoring.
- Balanced XLR mic and line analog inputs and two RCA analog line outputs. Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU balanced XLR
- Left/Right channel mic input attenuation selector(0dB/-30dB)
- 48v phantom power, built-in limiter & internal monitor speaker.
- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status, ID number, tape source status and machine status.
- Supplied Nickel Metal Hydride rechargeable battery powers the PDR1000 for two hours. The battery has no "memory effect" and is charged in two hours with the supplied AC Adapter/charger

PDR1000TC Additional Features:
In addition to all the features of the PDR1000 recorder, the PDR1000TC is equipped to record, generate and reference to time code in all existing International standards.

- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
- External syncronization to video, field sync and word sync.

Roland® DM-800
Digital Audio Workstation

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

POWERFUL EDITING
- Time compression, pitch compression
- Completely non-destructive cutting, erasing, copying
- Very fast looping for music or ambiance editing
- Scrub preview and preview to, from and thru
- Six levels of waveform zoom
- Optional RS-422 interface (D10-800D) for 9-pin control from video editor

FLEXIBLE I/O STRUCTURE
- Full digital patch bay
- Stereo AUX send buss
- Two stereo AUX returns
- Direct channel outs
- Digital stereo input and two digital stereo outputs
- Four balanced analog inputs with gain controls and four balanced analog outputs with option for 4 more

FULL AUTOMATION
- Dynamic and snapshot automation of level, pan, 2-band EQ, including frequency select, boost and cut
- Microscope editing of automation data
- Phase level editing of level, crossfade and fade in/out

TRIGGER FEATURES:
- Trigger mode to play any combination of 8 tracks for vocal fly ins or sound effects placements
- Advanced trigger mode for live operation with preset or dial up cue of phrases to be played one after another

MIDI FEATURES:
- MIDI machine control
- Internal tempo maps
- Accurate editing by bars and beats sub-beats
- MIDI clock and song position pointer output
- 8 MIDI triggers for instant phrase playback
- MIDI trigger of record and punch in/out
- Tempo maps from external sequences, MIDI or tap input.

ACCURATE SYNCHRONIZATION
- Frame accurate sync to any time code
- Locks to MTC
- Generates and reads all types of SMPTE, including 24.25. 29.97 (Drop/non-drop) and 30 frames per second
- Incoming SMPTE reshaped to output jack

RECORDING OPTIONS
- Records to standard SCSI hard drives
- Up to 24 hours recording time possible
- Uses Magneto Optical or Syquest drives for fast project changeovers
- Optional internal 2.5" Drives for portable operation

PROJECT CATALOGING
- Up to 150 projects on line at once
- Easy cataloging of sound effects and projects
- Easy transfer of sounds from one project to another
- File compatible with DM-80

HIGH QUALITY SOUND
- Sampling rates of 48/44.1/32 kHz
- 18-Bit A/D and D/A with 128 and 8 times oversampling
- 24-bit internal processing

VIDEO OUT
- Composite, S-video, digital RGB output
- All track overview with infinite level of project zoom
- Views of phrase and waveform editing
- Very accurate level mMeters
- Track status and time location

ALESIS adat xt
8-Track Digital Audio Recorder

An incredibly affordable tool, the new ADAT-XT sets the standard in modular digital multitrack recording. With new features & enhanced capabilities, the ADAT-XT operates up to four times faster than the original ADAT, offers an intelligent software-controlled tape transport and provides onboard digital editing and flexible autolocation.

Stunning Audio:
- Incorporates ultra-high fidelity 18-bit, 128 X oversampling A/D converters which provide better-than-CD audio quality.
- For outputs, the D/A converters provide 20-bit, 8x oversampling performance for a flatter frequency spectrum, improved phase response and much less low-amplitude distortion.
- Frequency response is 20 Hz to 20kHz ±0.5dB, S/N ratio is greater than 92dB, crosstalk between channels is better than -90dB @ 1kHz.

Flexible Inputs and Outputs:
- Servo-balanced 56-pin ELCO connector operates at +4dB for interfacing with consoles with +4 dB balanced/unbalanced inputs/outputs.
- Also includes unbalanced -10dB inputs/outputs (phono connectors).
- Has an electronic patch bay built-in so it can be used with stereo and 4-bus consoles.
- Multiple Optical Digital I/O can carry up to eight tracks at once completely in the digital domain. The digital I/O combined with the ADAT Synchronization Interface make it completely compatible with any ADAT-format recorder or other devices that use Alesis' proprietary digital protocol.

Digital Editor:
- Make flawless copy/paste digital edits between machines or even within a single unit. A new Track Copy feature allows you to make a digital clone of any track (or group of tracks) and copy it to any other track (or group) on the same recorder. This allows you to assemble composite tracks for digital editing.
- Use two or more ADAT-XTs and the Tape Offset feature lets you copy and paste not only from track to track, but from location to location. Tape Offset assembles the elements of a project with a minimum of repetitive over dubbing. It changes the relative tape position of a slave XT to its master, so you can "fly" audio to different locations on each tape.
- Track Delay feature allows you to delay the time reference of a track by up to 170ms. With Track Delay, you can easily change the groove of a tune. Track Delay is individually adjustable on each channel and is excellent for fixing slight timing errors in recorded tracks (player lags behind or rushes the beat). In recordings with multiple microphones, you can time-align each track, precisely compensating for the spacing between mics with accuracy to 0.0001 seconds.

Intelligent Transport:
- Rewinds and fast-forwards up to to 4X faster than the original ADAT.
- Advanced transport software continuously monitors autolocation performance and the head constantly reads ADAT's built-in sample-accurate time code—even in fast wind modes.
- Newly developed Dynamic Braking software allows the transport to quickly wind to locate points while taking every precaution to treat the tape gently.

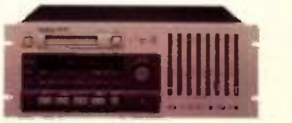
Onboard Autolocator with Auto Record:
- Onboard 10-point autolocate system provides quick access to multiple tape locations. Four specialized locate points make your recording sessions quicker and easier.
- Auto Play automatically enters Play the moment any autolocation point is reached, Auto Return automatically rewinds at the end of a loop.
- Auto Record function lets you automate punch-in/punch-out times that are accurate to 1/100th of a second.
- Rehearse Mode allows you to enter or exit record modes without actually laying tracks to tape.
- To record on the fly, you can even use the individual Record Enable buttons to punch in and out of tracks.
- Includes remote control with transport and locate functions, offers a footswitch jack for hands-free punch-in.

Optional Accessories:
- BRC Master Remote Control lets you command up to 128 tracks from a single location, with 460 nameable locate points, SMPTE & MIDI synchronization & extensive digital editing power.
- AI-1 Digital Interface offers sample rate and digital format conversion between the ADAT-XT's Optical Digital Interface and AES/EBU and S/PDIF formats.
- AI-2 Synchronization Interface allows synchronization to video and film. The AI-2 offers compatibility with video recorders and editing systems (including TimeLine's Lynx-2 system) and can issue MIDI Time Code and translate MIDI Machine Control commands to the ADAT-XT.

We Are Also Authorized For the Following...

AMPEX
JBL
Sabine
Apple
RIP-TIE
audio accessories
ROLLS
SAMSON

Digital Multi-Track Recorders
TASCAM



The first thing you notice about the eight channel DA-88 is the size of the cassette - it's a small Hi-8mm video cassette. You'll also notice the recording time - up to 120 minutes. These are just 2 of the advantages of the DA-88's innovative use of 8mm technology.

- The ATF system ensures that there will be no tracking errors or loss of synchronization. The DA-88 doesn't even have (or need) a tracking adjustment. All eight tracks of audio are perfectly synchronized. What's more, this system guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks - whether you have one deck or sixteen (up to 128 tracks!).
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48KHz .The frequency response is flat from 20Hz to 20KHz while the dynamic range exceeds 92dB.
- Execute seamless Punch-ins and Punch- outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks, whether you want to generate special effects or compensate for poor timing.

FOSTEX RD-8

Based on the S-VHS format, the RD-8 is designed for the home project or professional recording studio. Features include up to 40 minutes of recording time on a single tape, noiseless punch-in/out , selectable sampling frequencies of 44.1 and 48kHz and pitch and track delay controls. Systems are expandable from 8 to 128 tracks and there are a wide variety of options available.

- Full transport control is available via the RS-422 port, providing full control right from your video bay. The RD-8 records at either 44.1 or 48KHz and will perform Pull-Up and Pull-Down functions for film/video transfers. The Track Slip feature helps maintain perfect sound-to-picture sync and the 8-Channel Optical Digital Interface keeps you in the digital domain.
- The S-VHS transport in the RD-8 was selected because of its proven reliability, rugged construction and superb tape handling capabilities. 8 tracks on S-VHS tape allow much wider track widths than is possible on other digital tape formats.
- With its LCD and 10-digit display panel, the RD-8 is remarkably easy to control. You can readily access 100 locate points, and cross-fade time is fully controllable in machine to machine editing. Table of Contents data can be recorded on tape.
- Since the RD-8 is fully ADAT compliant, your machine can play tapes made on other compatible machines, and can be controlled by other manufacturers ADAT controllers. Your tapes will also be playable on any other ADAT deck.

SONY
PCM-800

Based on the success of Sony's multi-channel DASH-format recorders, the PCM-800 is an affordable and expandable 8-track digital system that employs Hi8 tape technology.

- Combines flawless sound quality, outstanding reliability and professional audio interfacing with AES/EBU digital I/O and XLR analog I/O connections.
- Combines all basic audio functions such as precise auto punch in/out digital cross fade technology, external synchronization with SMPTE/EBU time code and selectable sampling frequencies of 44.1 and 48kHz.
- Also features a shuttle dial for precise tape control, variable-speed playback of 6% in 0.1% increments and a flat frequency response from 20Hz to 20kHz.
- Up to 16 PCM-800's can be operated in perfect sync with optional RCC-S1 sync cables, providing up to 128 channels of digital audio recording and reproduction.
- Optional DABK-801 Sync Board provides SMPTE/EBU time code generation and chase synchronization. It can be locked to the incoming time code with subframe accurate offset, which is ideal for audio-follow-video applications.
- The DABK-801 also provides complete video synchronization to external video reference signal.
- Optional RM-D800 provides comprehensive remote control over all functions of the PCM-800. The RM-D800 can control up to six units for up to 48 channels of digital audio.

Minimum Shipping USA (Except AK & HI) $7.50, up to 3 lbs. Add 6% for each additional lb. For ins. add 40¢ per $100. © 1995 B&H Photo - Video. Not responsible for typographical errors. Prices valid subject to supplier prices.

CIRCLE 18 ON FREE INFO CARD

RECHARGEABLE POWER SUPPLY

PROBLEM SOLVED.

ECO CHARGE
CAUTIONS

The Pro's agree! Eco Charge rechargeable power sources make even the most demanding recording situations a breeze. The ECS line of rechargeable battery systems is extremely reliable, easy to use, and maintenance-free. Systems are available for *all* portable DAT recorders, analog recorders, and portable mixers. Battery/case systems are available in a variety of voltages and sizes and can be custom designed for specific requirements. Make power problems a thing of the past! Call Eco Charge today.

ECO CHARGE

P.O. Box 956 • Boulder, CO 80306 • TEL 303.449.5761 • FAX 303.449.1545
ORDERS 800.361.5666

AUDIO UPGRADES

LA-2A LA-3A OWNERS

Before you by a new T4B optical attenuator, have it rebuilt at a fraction of the cost. Also stock OPTO's.

ANTHONY DEMARIA LABS
914-256-0032

DA88 UPGRADES MIC MODS

Component level upgrades for mixing consoles, tape machines, mics, and all outboard gear. Also, high speed mic preamps. Step up to the 90's and hear what high speed electronics can do for your studio.

AUDIO UPGRADES
6410 Matilija Ave.
Van Nuys, CA. 91401
(818) 780-1222 (818) 346-2308 FAX

INFORMATION GUIDES

100,000 copies in print

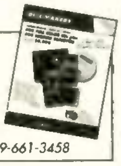
FREE!

GUIDE TO MASTER TAPE PREPARATION

DISC MAKERS
Guide to
MASTER TAPE
PREPARATION

Full of tips from the manufacturing side on how to prepare your master for error-free manufacturing.

A must for recording studios and audio professionals.



Call today for your FREE, 1995 full color catalog:
1-800-468-9353
24 HOURS TOLL FREE
Outside USA call 609-663-9030; FAX 609-661-3458

DISC MAKERS
AMERICA'S #1 MANUFACTURER FOR THE INDEPENDENT MUSIC INDUSTRY

CALL TARA ESPOSITO AT 212-378-0456 TO PLACE AN AD

REPAIR SERVICE

DAT TECHNIQUES

We repair all pro & consumer models. Fast turn-around at reasonable rates. Your Sony and Panasonic Specialists.

1-800-D-TECHNIC/1-800-203-2151

DAT Machine Service

Fast expert repairs on all DAT recorder brands and models.
Over 2000 machines serviced!
Compare our rates

***Pro Digital Inc.* 610.353.2400**

SONGWRITERS

SONGWRITERS!

Have you been searching for these items......?
*Contracts, Copyrights, Business Books, Blank Cassettes
*Blank, Color & Laser Printed Labels, B&W or Color J-Cards
*8X10 Bio Photos, 100 Qty. Duplication Packages B&W/Color
*Directories for Major Labels, Publishers, Radio Stations, Media
*Artist/Mgr/Producer Contracts, Critique Forms & Post Cards
Call Now!......(800) 487-SPIN "Free Catalog"
Songwriter Products Ideas & Necessities

MICROPHONES

COLES 4038 RIBBON MICS

THE BEST IN THE WORLD

SALES–SERVICE–PARTS

Call Wes Dooley
(800) 798-9127
Fax (818) 798-2378
1029 N. Allen Avenue
Pasadena, CA 91104

TRAINING/TUTORIALS

Recording Engineer

No experience required!

On-the-job-training

in local major Recording Studios

Part-time, nights, weekends
Free video and brochure tell how
Ask about our Record Label!
1-800/295-4433
http://www.sna.com/musicbiz

ACOUSTICAL PANELS

ALL NEW, MUCH IMPROVED

CLEAR-SONIC PANELS

A tough, light weight,
and portable solution
to your loudness problem!
Now more transparent!

NEW LOWER PRICES!

Call for our free brochure!

ACCUSONICS MFG.
(800)-888-6360

ACOUSTICAL FOAM

Acoustic Foam, Diffusors & Much More!

For over 13 years our acoustic foams & sound barriers have been making rooms sound **world-class** at **affordable prices**. Well, now we've **changed our name** & branched out with even more **cool stuff** that'll help you sound better. **New items: T'Fusor™** & **MiniFusor™** Full Bandwidth Diffusors (you won't believe how good the testing data & prices are!), **LENRD™** Bass Traps, **U-Boat™** Floor Floaters, Active & Passive **Studio Monitors**, **Mic Windscreens**, **NS-10M Tweeter Protectors** & more. Not only that, our new **expanded catalog** is packed full of even more **great acoustical advice** you can't get anywhere else! The catalog & sample kit are **FREE**, so call us **today**. Your room & wallet will be **very** glad you did!

Clients: AT&T, NASA, Sony, General Dynamics, Shure, Warner Bros., 20th Cent. Fox, ABC Radio Network, Ensoniq, '96 Democratic Convention, Ford, Hitachi, Dennis DeYoung (Styx), Toshiba, Universal Studios, Maury Povich Show, NPR, Skid Row, Community, US Gov't, Bootsy Collins, Manley Labs, ShowCo, Dick Ervasti (Voice of NFL on Fox), Pat Duke (Voice of McDonalds/Miller Brewing), KC Royals, MTX-Soundcraftsmen, etc...

Auralex (formerly USAFoam) ★ 11571 E. 126th Street ★ Fishers, IN 46038
Samples & Questions (317) 842-2600 ★ (800) 95-WEDGE ★ Fax (317) 842-2760

SILENT SPEAKER SYSTEMS/DI

MICRO ROOM Silent Speaker System
Record guitar or *any* amplified instrument at *any* volume... *SILENTLY.*
Preserves the sound and response of *your* amplifier. Complete and ready to use. Includes: Speaker, SM57® and Studiofoam *Two cubic Feet of Fully Equipped Studio Space*...$395

CONTACT: Folded Space Technologies
770-427-8288
PO Box 801008 Acworth Ga. 30101

MULTI-MEDIA ACCESSORY

CL6/1800 Midi Lighting Dimmer

- 6 Independent Channels of Dimming
- Responds to Midi Notes and Controllers
- Only $399.00 US List Price !

Ask about our other Midi products to control Valves, Relays, Servo's, Lighting, Analog Keyboards & more!!

MEDIA Motion
Show Control & Multi Media Systems

2461 West 205th Street, B100,
Torrance, CA 90501
Phone: (310) 320-0696
Fax: (310) 320-0699

Visa, MC, Discover & AmEx. "Dealer Inquires Welcome"

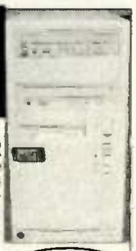
KEYBOARD ACCESSORIES

SCSI DRIVES
SALES-REPAIRS
& UPGRADES
SOFTWARE
MEMORY
RAM/ROM
SAMPLES

Email: sndlogic@connectnet.com

See us on the web at
http://www.ramona.com

SOUND LOGIC



STAND ALONE
CD RECORDER
Easy CD Pro Software
Pentium® Windows® 95
Yamaha CD Recorder
Toshiba 6X CD ROM
Diamond Stealth 64
Adaptec SCSI-2 I/F
Sony Color Monitor
1.2 GB & 1.44 MB
$2994

AUDIO SAMPLING CDs
Rock R&B Atmospheric $44 *Classic Synths F/X & Bizarre*

Akai S01
1MB RAM
$99

KEYBOARD
& PRO AUDIO
ACCESSORIES

INFO &
FREE CATALOG
619-484-9817
ORDERS: 800-753-6558
FAX: 619-484-9857
1125 ELEVENTH ST.
RAMONA, CA 92065

JINGLES

JINGLE PRODUCTION

Would you like to learn how to get into the Jingle Business?

I've been doing it for 17 years. My complete Jingle Course shows you exactly how you can do the same. Part-or-full time. Locally or nationally. CALL NOW! This information will save you years of trial and error. Make the money you want with your music TODAY. If you are already in the Jingle business. Check out our new syndication division. It's changing the industry.

Call 1-800-365-8688 or write to RSM-Direct
4542 E.Tropicana #211 - Las Vegas, NV. 89121
IN A BIG HURRY? Check out our Webb page
http://www.jinglebiz.com

SOFTWARE

FUNKED UP YET?

TWIDDLY.BITS VOLUME 6
THE FUNK

Licks & Tricks as MIDI Files
$34.95 (PC or Mac)

Also available:

Vol One, General Instruments
Vol Two, Gate Effects
Vol Three, Electric & Acoustic Guitar (featuring Steve Hackett)
Vol Four, Drums & Percussion (featuring Bill Bruford)
Vol Five, Country (featuring Scott Joss)
World Series Brazilian Rhythms
Classic Rock & Country Piano from John Rabbit Bundrick

To order, or for catalog, call 408-688-4505. Fax 689-0102
Twiddly.Bits, from KEYFAX Software
PO Box 958 Aptos CA 95001-0958.

STORAGE SYSTEMS

America's best disc, tape and component storage system
holds all recording formats

Free mailorder brochure
(please mention EQ magazine)

Per Madsen Design (415) 822-4883
P.O. Box 882464
San Francisco, CA 94188

EVEN SMALL ADS WORK!!

NEW & USED GEAR

THUNDER & LIGHTING INC.

PRO AUDIO AND LIGHTING SUPPLY

FROM STUDIO TO STAGE....
WE STOCK OVER 100 LINES

MAKE THE RIGHT CALL

TOLL FREE 1-800-333-9383
(860) 829-0434 Fax (860) 828-0558

SERVING THE PRO AUDIO MARKET OVER 20 YRS. "HONEST ADVICE, BEST SERVICE AND PRICE"

THE BEST MIC & WIRELESS PRICES IN THE U.S.A.
1000'S IN STOCK! 15 MAJOR LINES

CALL US NOW FOR A LINE CARD AND SALE FLYER. WE BUY AND SELL USED EQUIPMENT TOO!

RECORDERS - STUDIO PROCESSORS - CONSOLES - POWER AMPS - SPEAKER CABS - VINTAGE MICS - LIGHTING
WAREHOUSES IN CT. & CA.
WE SHIP WORLDWIDE

Don't Get Beat

When you need equipment call

8TH STREET MUSIC

(800) 878-8882

Philadelphia's Largest Musical Instrument Dealer!!!

8th Street Music, 1023 Arch St.
Philadelphia, PA 19107

Fostex - Multitrackers & DATS
Behringer - Samson - Zoom
Roland - Digitech
"Home Studio Processing"
Everything Discounted

1-800-535-7699 ***Roxy Music***

CARUSO MUSIC

SAVE THOUSANDS OF DOLLARS BUYING YOUR NEW & USED EQUIPMENT FROM US

94 STATE STREET • NEW LONDON, CT 06320
203.442.9600 • 203.442.0463 (FAX)
carusomusi@aol.com
Caruso Music 74012,664 (Compuserve)

EQUIPMENT DEALERS

SOUND PRODUCTIONS

Dallas, Texas

We Sell the ***MAJOR BRANDS*** of ***NEW & USED SOUND EQUIPMENT*** as Used by ***TOURING SOUND COMPANIES*** and ***LIVE MUSIC VENUES***

We Have ***WHAT YOU WANT*** at ***DISCOUNT PRICES***

Our ***SALES ENGINEERS*** are ***EXPERIENCED SOUNDMEN*** and can ***RELATE TO YOUR NEEDS***

If you are a ***SOUNDMAN***, get on our ***MAILING LIST*** for your ***SPECIAL DEALS***

Call Today and Find Out Why We Are #1 In Sound System Sales

VISA MasterCard DISCOVER

Sound Productions

800-203-5611

(214) 351-5373 • Fax 214/351-6782
Web Page: http://www.soundpro.com
E-mail: sndprodal@aol.com

THE SOUNDMAN'S CONNECTION SINCE 1973

ODYSSEY PRO SOUND

NEW, USED & VINTAGE QUALITY RECORDING EQUIPMENT

Competitive Prices *Satisfaction guaranteed*

Consoles*** Tape Machines*** Outboard
Microphones***Vintage***and MORE!

We buy, list, and trade quality audio equipment

Tel: (508) 744-2001 Fax: (508) 744-7224

VISA E-Mail: odyssey@pcix.com MC

RICH MUSIC

Digital Pianos Synthesizers
Pro Audio Software, etc.

Everything's Big in Texas...
***except* our prices**

"Before you jump call us last!"

Phone (800) 795-8493
Fax (817) 898-8659

Rich Music 1007 Ave. C
Denton, TX 76201

EQUIPMENT FOR SALE

STUDIO TECH SUPPLY

WORLD CLASS QUALITY - COMPETITIVE PRICING
SALES * SERVICE * INSTALLATION * CONSULTATION * LEASING

AKG AMEK TAC API BEHRINGER BEYER B&K BRAINSTORM BRYSTON CALREC CANARE CUTTING WEDGE DDA DEMETER DIGIDESIGN DOLBY-PRO DRAWMER DYNAUDIO EQUI=TECH EVENTIDE FOCUSRITE FOSTEX-PRO GENELEC HAFLER JOE MEEK KRK LEXICON MACKIE MICROTECH-GEFELL MOGAMI MRL MYTEK NEUTRIK NTI OPTIFILE OTARI PRO-CO SONIC SOLUTIONS SONY-PRO SPL SOUNDCRAFT SOUNDFIELD STUDIO-TECHNOLOGIES SUMMIT AUDIO TIMELINE TL-AUDIO TUBE-TECH UPTOWN VAC-RAC 4000 Z SYSTEMS AND MANY MORE

AUTHORIZED SERVICE

AMEK TAC DDA FOSTEX MACKIE MCI OTARI SOUNDCRAFT TASCAM...

9982 MONROE #407 DALLAS, TEXAS 75220

PHONE: (214) 358-0050 **FAX: (214) 358-0947**

Professional Console Housings for MACKIE 8•BUS MIXERS

800-427-5698
Outside U.S. 573-346-8549 • Fax 573-348-2769
ACI • Rt 3, Box 4374-A • Osage Beach, MO 65065

ARGOSY

HARD DRIVES

Digidesign Approved

Storage Solutions For
Protools - Session 8 - Am2
NEW 4gb Removables and CD-Rom Recorders. From $995

Don't Settle For Dropouts
Get Top Performance!

Tel: (954) 749-0555
E-mail: bigdisc@aol.com

BIG DISC
DATA STORAGE SYSTEMS

WRH

DUPLICATION/REPLICATION SERVICES

:OASIS:™
DUPLICATION
PRESENTS:

3 CRUCIAL STEPS FOR THE SUCCESS OF YOUR CD RELEASE

1. Work with a Reputable Duplication Company

Oasis has several worthy competitors, but not all duplicators are reputable. Things to check:

- Financial stability of the company. (Caution: **there has been a recent rash of duplicator bankruptcies.** Make sure your duplicator won't collapse while it has your masters!)
- Is the price too LOW? If a deal seems too good to be true, it probably is.
- Consider the quality of the company's clientele--does it work with professionals--names you recognize? Ask for references.
- Consider how knowledgeable & helpful the company's staff is on the phone: do they know the music business? Are they interested in your project's potential?

2. Work with a Qualified, Independent Graphic Artist

If you want your product to compete with the major labels, you have to look as good as they do. **One-stop "chop-shop" duplicators who offer one-size-fits-all graphics aren't going to cut it.**

This is your project: you need to sit down and work with your own graphic artist-- **face-to-face.** Resources for finding good graphic artists in your local area include local ad agencies, fellow musicians, or a free referral from the Oasis graphic artist database. (You can e-mail or call Oasis & we'll locate a good graphic artist for you in or near your hometown.)

3. Think Backwards--Plan Your Promotion First

What good is a CD release if nobody hears it? Make sure you get your music to radio. Try to get onto a **radio-oriented sampler CD program,** such as the OasisAlternative™, OasisAcoustic™, OasisRock™, & OasisJazz™ sampler CDs, which go to every radio station in their genres.

Be sure to also take advantage of the inexpensive promotion and distribution opportunities available on the **World Wide Web**. You can set up your own Web "homepage," or you may want to consider joining the Oasis-sponsored **Musicians on the Internet** program, which promotes your CD online & distributes it via the CDnow superstore.

If you are in need of CD & cassette duplication, Oasis offers its assistance:

Call (800)697-5734 **or e-mail to oasiscd@clark.net for more information**

And check out "A Musician's Guide to CD Manufacturing," *http://www.oasiscd.com*
for a more thorough discussion of the topics we've touched on here

---

a+r Est. 1967
Record & Tape Mfg., Inc.
902 N. Industrial Blvd.
Dallas, TX 75207
214-741-2027
1-800-527-3472
CD's Starting at
$900⁰⁰

VISA/MC ACCEPTED

MAJOR LABEL QUALITY & SERVICE

★ **VINYL PRESSING**
SPECIAL RADIO & PROMO PACKAGES
★ **COMPACT DISCS**
★ **CASSETTES**

No Hidden Costs!

1,000 CD'S
$1,200!
PROPHET DISC MFG
Includes jewel box 2 color CD imprint & shrink wrap
1-800-491-8141

Duplication Systems

RELIABILITY
DURABILITY
EASE OF USE
marantz

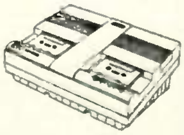
That's what you get with a Marantz duplication system from Full Compass. Marantz has totally integrated real-time analog cassette duplication systems that will be custom designed for you. For complete information and a price that's too low to advertise call Full Compass.

FULL COMPASS
1-800-356-5844

SRS

Recording & Duplicating Supplies

Telex®



DAT- ADAT- D88 - Reel to Reel Tape
Bulk Audio & Video Cassettes
Cassette Albums & Padded Mailers
Custom Cassette Lengths
For our FREE CATALOG
Call 1-800-450-8273
No Minimum Order

Call for a free brochure of
Telex Duplicating Equipment
Southern Recording & Sound Inc.
Greenville, SC

AMPEX

USE COLOR....IT WORKS!!

WRH

DUPLICATION/REPLICATION SERVICES

PREMIUM CUSTOM LOADED BULK AUDIO CASSETTES

HIGH BIAS (TYPE II) CASSETTES FOR MASTERING AND/OR ORIGINAL RECORDING

TDK PRO SA BULK

UNLABELED AND UNBOXED • MAGNETIC MEDIA CLEAR 5-SCREW SHELLS

Quantity	C-10	C-20	C-30	C-45	C-60	C-90	C-100
25-99	$0.31	$0.37	$0.44	$0.50	$0.61	$0.82	$0.90
100-999	$0.28	$0.34	$0.40	$0.46	$0.55	$0.77	$0.90
1000+	$0.25	$0.30	$0.35	$0.44	$0.52	$0.76	$0.87

CALL FOR FREE FULL LINE A/V CATALOG

MAXELL XLII BULK

UNLABELED AND UNBOXED • MAGNETIC MEDIA CLEAR 5-SCREW SHELLS

Quantity	C-10	C-20	C-30	C-45	C-60	C-90	C-100
25-99	$0.32	$0.37	$0.42	$0.54	$0.61	$0.83	$0.90
100-999	$0.30	$0.34	$0.40	$0.49	$0.58	$0.79	$0.90
1000+	$0.27	$0.32	$0.38	$0.47	$0.52	$0.76	$0.87

PREMIUM ROUNDED-EDGE ALL CLEAR NORELCO BOXES ► $0.13 each

12-up labels 30¢ per sheet. 6-up insert cards (J-cards) 30¢ per sheet. All other lengths loaded and priced at next highest length. Loaded precisely to your specifications.

WE WILL MATCH ANY ADVERTISED PRICE!

NOW! RECORDING SYSTEMS, INC.
32 WEST 39TH STREET, 9TH FLOOR, NEW YORK, NY 10018
Telephone: 212-768-7800 • 800-859-3579 • Fax 212-768-9740
We accept VISA - MasterCard - American Express or UPS COD Cash Only
Prices subject to change without prior notice

$50 MINIMUM PRODUCT ORDER

(Shipping charges extra) Brands and lengths may be mixed to reach quantity prices

CD's • CASSETTES VIDEO

1-800-365-TAPE (8273) • 1000 CD Package - $1499!

CD's, CD ROM, CD Plus • Complete Graphic Design, Printing and Packaging
Direct-from-Digital Real Time & High Speed Cassette Duplication
500 CD pkgs. • VHS Hi-Fi Duplication • Blank Tapes & Accessories
100% Guaranteed

Complete State-of-the-Art Manufacturing

FREE FedEx & Fast CD's™

Free Color Catalog

EASTCO PRO

Free Color Catalog

Over a decade serving America & the World

40 Gardenville Pkwy. W. • Buffalo, NY 14224 • Phone: (716) 695-1296 • Fax: (716) [illegible]

CD-R MASTER

603 352-3403

74 min

$85
All Mastering Included

BLUE PLANET STUDIO

blueplanet@top.monad.net

COMPACT DISC MANUFACTURING CASSETTE MANUFACTURING

FREE CATALOG

800-289-9155

outside U.S. (516) 244-0800
http://www.pb.net/~ccmusic

You'll Hear and Feel the Difference

- CD REPLICATION
- CASSETTE DUPLICATION
- DIGITAL MASTERING
- GRAPHIC DESIGN
- PRINTING
- PACKAGES
- ONE OFF CDs

C&C MUSIC

DEAL FACTORY DIRECT AND SAVE!

THE BURN HOUSE LTD.

DIGITAL EDITING AND MASTERING

CD ONE OFFS UP TO 74 MIN. STARTING @ $30.
RED BOOK READY EDITED UP TO 74 MIN. @ $45.
RED BOOK READY MASTERED UP TO ONE HOUR @ $70.

FOR MORE INFO PHONE (315) 452-1344
E-mail: burnhouse@aol.com or geoaudio@vcomm.net
Web page: http://www.vcomm.net/~geoaudio

GUARANTEED 24 HOUR TURNAROUND

NEW PRODUCTS/SERVICES

(410) 882-7011 8708 EDGEFIELD RD BALT., MD 21234

Toyz Recording Studio

SINGLE CDs WITH FULL COLOR DIRECT ON DISC PRINTING

ONLY $32.00 up to 10 min. (from any format)

Up to 30 min. - $38.00
Up to 60 min. - $49.00
Up to 74 min. - $57.00
(plus shipping)

DISCOUNT ON MULTIPLES!

VISA ACCEPTED

CD & CASSETTE MANUFACTURING

FEATURING THE SOUTHWEST'S FIRST & ONLY DIGITAL BIN CASSETTE SYSTEM & LARGEST REAL TIME CASSETTE FACILITY!

PRINTING • GRAPHIC DESIGN • BLANK CASSETTES
DIGITAL MASTERING & EDITING • ONE-OFF CD-Rs

PACKAGES AVAILABLE! CALL FOR FREE CATALOG!

CRYSTAL CLEAR SOUND TAPEMASTERS
1.800.880.0073

CD'S FAST

*300 CD Special: $849
*500 CD Special: $999
*with client provided CD-R or 1630 and artwork.

Digital Mastering, CD-Rom & Graphic Design Available

new Silicon Graphics Digital Printing

Full color inserts from $275

10 Free Posters w/ complete package

Call (800) DIGIDOC

DIGIDOC PRODUCTIONS

DIGITAL FORCE®

212 333-5953

e-mail: digitalforce@morebbs.com

TOTAL CD, CD-ROM & CASSETTE PRODUCTION

MASTERING	GRAPHIC DESIGN
REPLICATION	PRINTING
PERSONALIZED EXPERT SERVICE	PACKAGING

The Power of Excellence SM

330 WEST 58th ST, NY, NY 10019

DRT Mastering

You *will* have the big, high-impact major label sound that sells discs... or the work is free! Custom signal chains. First class results.

Outrageous Replication Prices.

Free brochure 800-884-2576

www.drtmastering.com/biz/drt

• DO IT *RIGHT*, RIGHT HERE ! •

aai Deal Direct With The Manufacturer For Results You Can Trust !

- RECORD PRESSING / COLOR VINYL
- CD PRESSING / ALL QUANTITIES
- CASSETTE DUPLICATION
- DESIGN / FILM / PRINT
- COMPLETE PACKAGES:

1000 CD's IN JEWEL BOX WITH PRINT - $1625
1000 CHROME CASSETTES W/ J-CARD - $1050
500 VINYL SINGLES IN DIE-CUT JAX - $1050

If you can make the music, we can do the rest. Rely on the indie experts with major label experience !

For a free catalogue or a custom quote, call:
1 • 800 • 869 • 6561
ALIGNED AUDIO INCORPORATED

Quality in service to the music industry since 1986.

DUPLICATION/REPLICATION SERVICES

CD PRODUCTION / PRE-MASTERING

- **15 day turn CD Pressing** 1000 discs in bulk, 1 color imprint, guaranteed turn* **$995.00**, or the shipping is free! GRAPHICS/PRINTING AVAILABLE.
- **Master CD + 9 Copies: $199.00** w/label!
- **PQ'd CDR for CD Pressing, to 60 min.: $75.00**
WE CAN ACCEPT 1/2" & 1/4" 30IPS MASTERS - 20 BIT A/D!
- **Discounted shipping available. Save to 30%!**
- We provide expert assistance in getting your project done right. Ask us about our recent major label credits.

For a rate sheet & info, call
1•800•352•2964
ALPHA MASTER WORKS

*from time master and art is approved by client.

Good Vibrations—RJR Digital

IT'S OUR 20TH ANNIVERSARY!

Call for best prices & service in the industry.
CD and Cassette packages include:
• Mastering • Design • Film & Printing
• Replication • Fabrication
TOTALLY RETAIL READY!

Fax On Demand: 1-800-828-6537
Customer Service: (619) 267-0307
FAX us at: (619) 267-1339

TOM PARHAM AUDIO PRODUCTIONS

DIGITAL BIN CASSETTE DUPLICATION

100 C-30&1CD REF B&W J-CARDS, BOX & ON SHELL PRINT $279
250 C-30 W/B&W J-CARDS, BOXES & ON SHELL PRINT $375
500 C-30 W/B&W J-CARDS, BOXES & ON SHELL PRINT $575
1000 CDs & 1000 CASSETTES 4 COLOR INSERTS $3125
DIGITAL MASTERING SPECIAL 2HRS. W/100 CASSETTES $425

FREE J-CARDS
WITH ALL **CASSETTE** ORDERS!

SONIC SOLUTIONS digalog
ABSOLUTELYTHEBEST
1-800-BIN-LOOP

MASTERING • MANUFACTURING • PRINTING

DIGI·ROM™

FOR COMPACT DISCS • CD-ROM
REAL TIME & HIGH SPEED AUDIO CASSETTES

COMPLETE PACKAGES • COMPETITIVE PRICING
GRAPHIC DESIGN STUDIO • PERSONALIZED
EXPERT SERVICE • FAST TURN-AROUND

CALL (800) 815-3444
(212) 730-2111

130 WEST 42ND STREET • NEW YORK, NY 10036

THE NAMES YOU KNOW AND TRUST...

HIGH BIAS BULK BLANK AUDIO CASSETTES

LENGTH	maxell XL II	BASF CHROME SUPER WITH [illegible] MK-10 SHELL
C-10	32 ¢	40 ¢
C-15	36 ¢	42 ¢
C-20	37 ¢	47 ¢
C-30	42 ¢	55 ¢
C-46	55 ¢	70 ¢
C-62	60 ¢	75 ¢
C-80	80 ¢	95 ¢
C-92	85 ¢	97 ¢
C-100	95 ¢	99 ¢

All Lengths Available 1 Min. - 126 Min. 100/MINIMUM

CUSTOM PRINTED LABELS AND J-CARDS
ROUND EDGE
NORELCO BOXES
CRYSTAL POLY BOXES
CD JEWEL BOXES

DIRECT ON CASSETTE PRINTING AND SHRINK WRAPPING

COMPLETE PRODUCT LINE FROM
AMPEX - BASF - TDK - 3M
SONY - MAXELL

AUDIO VIDEO & DIGITAL PRODUCTS
DAT'S - CDR'S - A-DAT'S - MOD'S
HI-8MM - DCC'S - MINI DISC

...FROM THE COMPANY YOU KNOW & TRUST

764 5th Ave, Brooklyn, NY 11232
In NYC Tel: (718) 369-8273
24 Hr Fax (718) 369-8275

NRS
National Recording Supplies Inc.

CALL TOLL FREE 1-800-538-2336

Proto Sound
LOW Prices!
FREE Brochure!
MAJOR Label Quality!
FRIENDLY Customer Service!

Compact Disc & Audio Cassette Production
(802)453-3334 FAX (802)453-3343

MEDIAWORKS INTERNATIONAL, INC.

1719 West End Ave. Ste. 100E
Nashville, TN 37203

CD, CD ROM, Cassette, Video, & Vinyl Disc Manufacturing

Call Today for the BEST
in Quality and Service at
Competitive Prices

Phone (615) 327-9114
Fax (615) 327-3438

1000 CD'S as low as $995.00*

Mastering Included

CD LABS will master your music and put it on CD's for the lowest prices in the industry!

We use the finest Master CD writers & software to guarantee you the best quality available and save you hundreds of dollars in mastering fees.

Here's why we're the choice of studio professionals for CD mastering and editing, and quantity CD replication:

Same or next day service on Master CD
Lowest Mastering Prices in the Industry
EQ & Level Correction Service
Digital Editing and NoNoise tm Service
Low Priced Quantity CD Production

DELUXE CD PACKAGES
500 CD's w/4 page 4 color Inserts.....ONLY $1350
1000 CD's w/4 page 4 color Inserts....ONLY $1795

DELUXE CD/CASSETTE PACKAGES
500 ea.w/4 pg 4 color book & J-card...ONLY $1995
1000 ea w/4 pg 4 color book & J-card..ONLY $2795

THE ABOVE PRICES ALSO INCLUDE DAT TO CD MASTERING w/PQ LOG SHEETS, 2 COLOR CD LABEL, CASSETTE LABEL, JEWEL BOXES & 2 MASTER CD'S

*BULK PACKED W/2 COLOR LABEL also 500 CD'S ONLY $795

COMPLETE GRAPHIC DESIGN SERVICE AVAILABE

CD LABS™
Direct to CD Mastering

12517 CHANDLER BLVD., STE. 107
NO. HOLLYWOOD, CA. 91607
(818) 505-9581--(800) 4 CD LABS

HIGH-SPEED CASSETTE DUPLICATION CD REPLICATION FAST TURNAROUND

1000 CD's $1299
Includes:
- 2 Color Label Imprint
- Jewel Box and Shrinkwrap

1000 Cassettes $599
Includes:
- Bin Loop Master
- Test Cassette
- Clear Shells
- Norelco Box & Shrinkwrap
- Imprinted Direct to Shell

Bring your own J cards and/or CD Inlays

DELUXE PACKAGE $1859
1000 CD'S AND 1000 CASSETTES
PACKAGE INCLUDES
ALL FEATURES SHOWN ABOVE

UNIVERSAL AUDIO PRODUCTIONS, INC.
15705 Arrow Hwy. Unit 1
Irwindale, CA 91706
Phone 818.856.8625
Fax 818.856.1736

IT PAYS TO ADVERTISE IN EQ

DUPLICATION/REPLICATION SERVICES

10 PROMO CD's
only **$175** (30 min)
CDR SINGLES
$19-$49
FREE graphic & label !
888-367-9242
GREEN DOT AUDIO
Nashville TN

28TH ANNIVERSARY
FREE CATALOG

CD-RS, HI-8,
MINI DISKS, S-VHS
MASTERING TAPE
A-DAT, R-DAT, BULK VHS
PLASTIC REELS, BOXES
NORELCO , SOFT POLY BOXES
VIDEO BOXES & SLEEVES
SINGLE & DOUBLE CD BOX
DCC, MOD, DDS2
AND
MORE

4212 14TH AVENUE - BROOKLYN, NY. 11219
ANDOL
AUDIO PRODUCTS INC.

FROM 1-100 MINUTES
100 PIECE MINIMUM

LENGTH - TYPE	C-10	C-20	C-30	C-40	C-50	C-60	C-70	C-80	C-90
TDK SA	.25	.30	.35	.39	.44	.49	.53	.58	.63
MAXELL XLII	.27	.32	.38	.44	.47	.52	.67	.70	.76
BASF CHROME SUPER	.30	.38	.47	.56	.65	.69	.80	.87	.89

3M
TDK
BASF
AMPEX
maxell

IN HOUSE DIRECT ON CASSETTE PRINTING
• CUSTOM PRINTED LABELS & J-CARDS •
IN NYC 718-435-7322 • **800-221-6578** • 24 HOUR FAX 718-853-2589

SINGERS! REMOVE VOCALS
Unlimited, Low Cost, Instantly Available Background Music from *Original Standard* Recordings! Does Everything Karaoke does... *Better and* gives you the **Thompson Vocal Eliminator™**
Free Brochure & Demo Tape.
LT Sound Dept EQ-1
7980 LT Parkway, Lithonia, GA 30058
Internet-http://ltsound.com
24 Hour Demo/Info Request Line (770)482-2485-Ext 28
When You Want Something Better Than Karaoke!

WAVE
1-800-928-3310
World Audio Video Enterprises

Complete CD packages !
Retail ready including full color inserts.

Bar-codes, CD-Rom, CD-R, Mastering, Design and Film services available.

	300	500	1,000
CD's	$975	$1075	$1637
Cassettes	$396	$506	$752

1-800-TAPE WORLD or 1-800-245-6000
We'll beat any price! 5.95 SHIPPING • FREE CAT

SONY		MAXELL		TDK		FUJI	
DAT-120	5.99	XLII-90	1.59	D-90	.79	SVHS-T120	6.49
DAT-124 PRO	8.99	XLII-100	1.99	SA-90	1.49	HI 8 120	5.99
T-120V	1.69	XLII-S 90	1.99	SAX-90	1.99	8MM-120	3.49
L750BTHG	3.99	T 120 HGX	2.49	SAX-100	2.49	DCC-90	6.99
ST-160	7.99	ST 120	6.99	T 120 EHG	2.49	DR-I 90	.69
CDR-74	6.99	DAT-124 PRO	7.99	DAT-120	6.49	JVC ST120	5.99
MDW-74	8.99	UD35-90	8.99	CDR-74	6.99	XEII-30 PRO	[illegible]

TAPE WORLD 220 SPRING ST BUTLER PA 16003 FAX 412-283-8298
OVER 500 DIFFERENT SAME DAY SHIPPING [illegible]

$1150 1000 CDs w/2-color printing & mastering **$95** PreMaster Compact Disc
Featuring high quality PMCD mastering by Grammy® nominated engineer David Moody. Editing, Level Maximizing, Stereo Imagery, Noise reduction, EQ, Compression & Restoration.
Digital Mastering • CD-Rs • Real Time Cassettes • CDs • Insert Printing
dLAB Studios Int'l. 704/882-6134 Visa • MC • AmExp **1(800) 243-3522**

CUSTOM COMPACT DISCS
Affordable single copy CDs starting at $30.
Write, call or fax.
46 PRODUCTIONS
42W557 Hawk Circle
St Charles, IL 60175
TEL (800) 850-5423 FAX (800) 203-1725
Contact Us On The Internet at FortySixP@aol.com
Visit our Web Page at http://www.beaches.net/46P

REALTIME CASSETTES from DAT
No Minimums!
Shipped in 24 hrs!*
30 KABA Decks • Chrome Bias • Imprints
Professional Graphic Design • Full Color Inserts
Every Tape Quality Checked! • DAT-to-DAT
CALL FOR FREE SAMPLES AND BROCHURE
FULL PACKAGE
100 Cr02 w/Full Color
$245**
WINGSPAN PRODUCTIONS
Where Sound Thoughts Take Flight.
800-646-6013 ext. 5091
*100 tapes or less, excludes graphics

WE'LL BEAT ANY PRICE ON CD'S
- QUICK
- BEST QUALITY
- COMPACT DISCS
- DIGITAL CASSETTES
- PERSONALIZED SERVICE
- TOTAL COMPLETE PACKAGES
- LOWEST PRICES, CALL US LAST!

(813) 446-8273
Total Tape Services
639 Cleveland St. / Clearwater, FL 34615

CD RECORDABLES
Starting as low as $20 per disc!
Prices include insert, tray card, disc label, photo &/or logo, 3-4 day turnaround and shipping! Virtually any source!
Φ FLUX AUDIO/VIDEO 1.800.423.FLUX

WHITEWATER RECORDING
704-274-0956 9 Busbee View Road
Asheville, NC 28803
Retail-Ready Packages! Call for our free 1995-96 catalog
500 CD's B/W $1389 Full Color $1689
1000 CD's B/W $1889 Full Color $2147
300 TAPES Full Color $589.00 Real-Time $759.00
CD packages include mastering, design, film, label, box, & wrap

---

CD-Audio & CD-ROM
- Audio & Video Cassette Duplication
- Mastering • 1630 • PMCD • CDR
- Graphic Design & Printing
- Retail-Ready Packages • Fast Turn

Bulk CD's
as low as
60¢
CD SONIC
Tel: (617) 424-0670 Fax: (617) 424-0657
Toll Free 1-888-CD SONIC (237-6642)

TRANSFER YOUR MUSIC TO CD
1 Off 63 min. $34.95 S/H $4.95
Send to: **DRD,**
P.O. Box 147 Etna, OH 43028
CALL 1-800-867-8918

One Stop
Full Service Digital House
▲ CD & Cassette Mastering and Replication
▲ Digital Audio Post production
▲ CEDAR Sonic Restoration
DDAI
Using Today's Technology
To Bring Your Project
To Tomorrow's Standards.
3383F Industrial Blvd. Bethal Park, PA 15102
Call 1-800-444-DDAI

Stepping Stone
Killer Prices - Great Service
- 1000 CDs w/color inserts, film seps, layout: $1580. 1000 cass/color inserts: $975 500: $595
- Call about large qtys, graphics svcs, raw CDs mastering. You'll be glad you did! Free brochure.

888-777-DISC www.mv.com/biz/steppingstone

CALL TARA ESPOSITO TO PLACE AN AD...IT WORKS!!

WRH

LOUDSPEAKERS

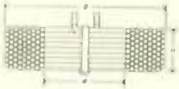
SOLEN SPEAKER COMPONENTS

DAVIS ACOUSTICS
DYNAUDIO
LPG
LA PASSION DU HAUT-PARLEUR AUDAX
vifa
ETON
morel
scan-speak
seas
CERATEC
Peerless
AIRBORNE

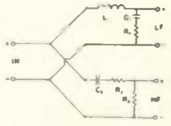
CROSSOVER COMPONENTS

FAST CAPACITORS
Metallized Polypropylene (Non-Polarized)
Values from 1.0 mfd to 220 mfd
Voltage Rating 250 VDC 150 VAC

HEPTA LITZ INDUCTORS
Seven Strands Litz-Wire Constructions
Values from 10 mH to 30 mH
Wire sizes from #16 AWG to #12 AWG



SOLEN INDUCTORS
Perfect Lay Hexagonal Winding Air Cored
Values from 10 mH to 30 mH
Wire Sizes from #20 AWG to #10 AWG



SOLEN CROSSOVERS
Custom Computer Design
Passive Crossover for Professional, Hi-Fi and Car Hi-Fi, Power up to 1000 Watt

CROSSOVER, SPEAKER PARTS
Gold Speaker Terminals, Gold Banana Plugs, Gold Binding Posts, Crossover Terminals, Power Resistors, Mylar Capacitors, Plastic Grill Fasteners, Nylon Ty Wraps, Car Speaker Grills, Misc. Parts

SOLEN INC.
4470 AVENUE THIBAULT
ST-HUBERT, QC J3Y 7T9
CANADA

TÉL.: (514) 656-2759
FAX: (514) 443-4949

Computer Aided Design for enclosure and crossover available to customer
CATALOG $6.00 REFUNDABLE

FOR SALE

APOGEE

Apogee Electronics has a number of remanufactured AD-500 stereo 18-Bit Analog to Digital converters we have taken in on trade. We are offering these units at a special price of $1,495 with a one year warranty.

APOGEE ELECTRONICS
Phone (310) 915-1000
FAX: (310) 391-6262

RECORDING STUDIO

The Place

We have created the *ultimate* state-of the-art tracking facility. Ideal for Indy Label album projects who need to make a first class CD at half the usual cost. **Otari MTR-90 II 24** Track Tape Machine, **Neve** and **Tubetech** Mic Pre's, Digital Editing and Mastering, Lots More Outboard Gear!!

RECORDING FOR INTERACTIVE MEDIA!
WE ARE PROUDLY UNBEATABLE!!!!
The Place 408 W. 14th St. Suite 16
(212) 924-2193

COVERS/CASES & RACKS

OMNIRAX
STUDIO FURNITURE for the discriminating musician

800-332-3393
P.O.BOX 1792 SAUSALITO, CA 94966

EQUALIZER

The New American Classic
The 52270 Mic Pre/Eq
All Discrete & Transformer Balanced
Designed & built in the U.S.A. by
Geoffrey Daking & Co. Inc.
800 522 3650 302 658 7003
GeoffDake@AOL..com

See Our Ad on Page 128

TRAINING

THUNDERBIRD RECORDING SCHOOL
Apprentice Style/ Hands-On Training
Call for Video and Brochure
1-800-914-8004

UTILITIES

Anderton's Utilities for the Mac

800K disk with "drum loop construction set" MIDI files, test sequences, controller library, AIFF test tones, standard forms, MIDI terminal, much more!
$29.95 ppd

New Books!

Multieffects for Musicians
You've paid $$ for your multieffects - now get the most out of it with this definitive collection of insider tips. **$17.95**

Digital Projects for Musicians
Build a single-board MIDI computer, then plug in different chips to run 20 different projects. "I can't think of a better place [to get a working knowledge of musical electronics]" – Keyboard Magazine. **$24.95**

Do-It-Yourself Projects for Guitarists
35 useful, inexpensive projects to help unlock your instrument;s potential. "Great stuff from a master DIY-er" – Guitar Player Magazine. **$19.95**

"Forward Motion" CD

Now available direct. Rolling Stone said this lush, layered music is "One of those rare instrumental electronic albums that is not mere new age tapioca."
$14.95 ppd.

HOW TO ORDER

MONEY BACK IF NOT SATISFIED.
Cal res add tax. Send check or money order (add $3 s/h per book), name, address, and phone to:
Craig Anderton
Box 966, Ukiah, CA 95482

ACROSS THE BOARD

continued from page 146

11). This little patchbay had 24 connectors in it for $40. I could hook up 11 pieces of digital gear and have one connection to the Z Systems box.

At first, I thought that digital audio through a telephone connector couldn't be good enough for my needs, but then I realized that this is the standard connector for connecting computers to Ethernet that have data rates of 10 megabits per second. If it is good enough for that, then it should be good enough for digital audio.

AES is actually a balanced signal. Pins 2 and 3 of the XLR carry the digital audio signal, so you really only need two pins worth of phone connector to do the job. I decided on the eight pins to thwart any potential bad patch connections. I connected pin 2 of the XLR to pins 1, 2, and 3 of the RJ-45 jack, and pin 3 of the XLR to pins 6, 7, and 8 of the RJ-45 jack. I now have three pins making the connection for each wire. Chances are a lot better of making a good connection. Half of the connectors are wired to male XLRs for output and the other half is wired to female XLRs for input.

For patch cords, you can either buy Ethernet patch cords at places like Computer City or CompUSA, or you can make them yourself with some RJ-45 connectors, an RJ-45 crimper, and some eight-conductor Ethernet cable. I cut the wire into two foot lengths, crimped a connector on each end, and I was in business. Make sure the patch cords are wired straight thru, pin 1 to pin 1, etc.

I hooked the digital equipment that I do not use very often to the new patchbay and connected one of the jacks to the Z Systems box. It all works perfectly. Now I can connect anything to anything. The total cost of this little puppy was $125, including all of the XLRs. And what's even better is that now that I talked about it in my column, I can write it off. Cool, huh?

EDITOR'S NOTE: If you want Roger to put more cool stuff on his web page, you better check it out and leave him a note, or he will be really peeved! See it at http://www.digital-atomics.com.

MI INSIDER

continued from page 36

listening volume and the second channel down full. Gradually turn up the second channel; if the effect level decreases, then the processed outputs are out of phase. If the effect level increases, all is well.

10. Paralleling multieffects with guitar amps. One way to enrich a sound is to double a multieffects with an amp and mix the sounds together. Although you could simply split the guitar through a Y-cord and feed both, here's a way that can work better.

To supplement the multieffects sound with an amp sound, send the multieffects "loop send" (if available) to the amp input. This preserves the way the multieffects input stage alters your guitar. If you'd rather supplement the basic amp sound with a multieffects, feed the amp's loop send to the multieffects signal input to preserve the amp's preamp characteristics.

Well, that covers the 10 tips. Until next time, have fun strumming those wires — and remember that the magic word for all guitar multieffects is equalization. **EQ**

CALL 1•800•672•4128 FOR A FREE RECORDING & LIVE SOUND CATALOG!!!!

- LARGE SELECTION
- FAST DELIVERY
- GUARANTEED BEST PRICES
- 30-DAY Return Policy
- 30-DAY PRICE PROTECTION

2 Day Air Express

Our 20th Year!

PRO SOUND & STAGE LIGHTING™

Mail Order Center:
11711 Monarch St., Garden Grove, CA 92641

Retail Super Store: Music To The Max,
14200 Beach Blvd., Westminster,
CA 92683 (714) 379-1994

MUSIC TO THE max™

Mail Order Center Hours: Mon-Fri 6 am - 8 pm, Sat 7 am - 5pm, Sun 8 am - 5pm (Pacific Time)

CIRCLE 50 ON FREE INFO CARD

COMING UP IN EQ AUGUST

SPECIAL POSTPRODUCTION ISSUE. EQ takes a special look at audio-for-video, including a behind-the-scenes look with Elliot Goldenthal (A Time to Kill) and reviews of hot postproduction gear — including Digidesign's Pro Tools IV.

BACK TO SCHOOL. September is only a few months away, and you know what that means — back to school. Interested in the higher learning aspects of audio production? EQ tells you how to pick the recording school that's right for you.

PC RECORDING 2: It's back! You loved it in May, and so it's here again in August. Join Craig Anderton and David Miles Huber for another look into the many facets of computer recording.

To be a part of this exciting issue, contact: Kathleen A. Mackay; Associate Publisher Matt Charles, Andrea Berrie, Christine Cali, Pete Seidel; Advertising Sales

Tel: 212-378-0400
Fax: 212-378-0484

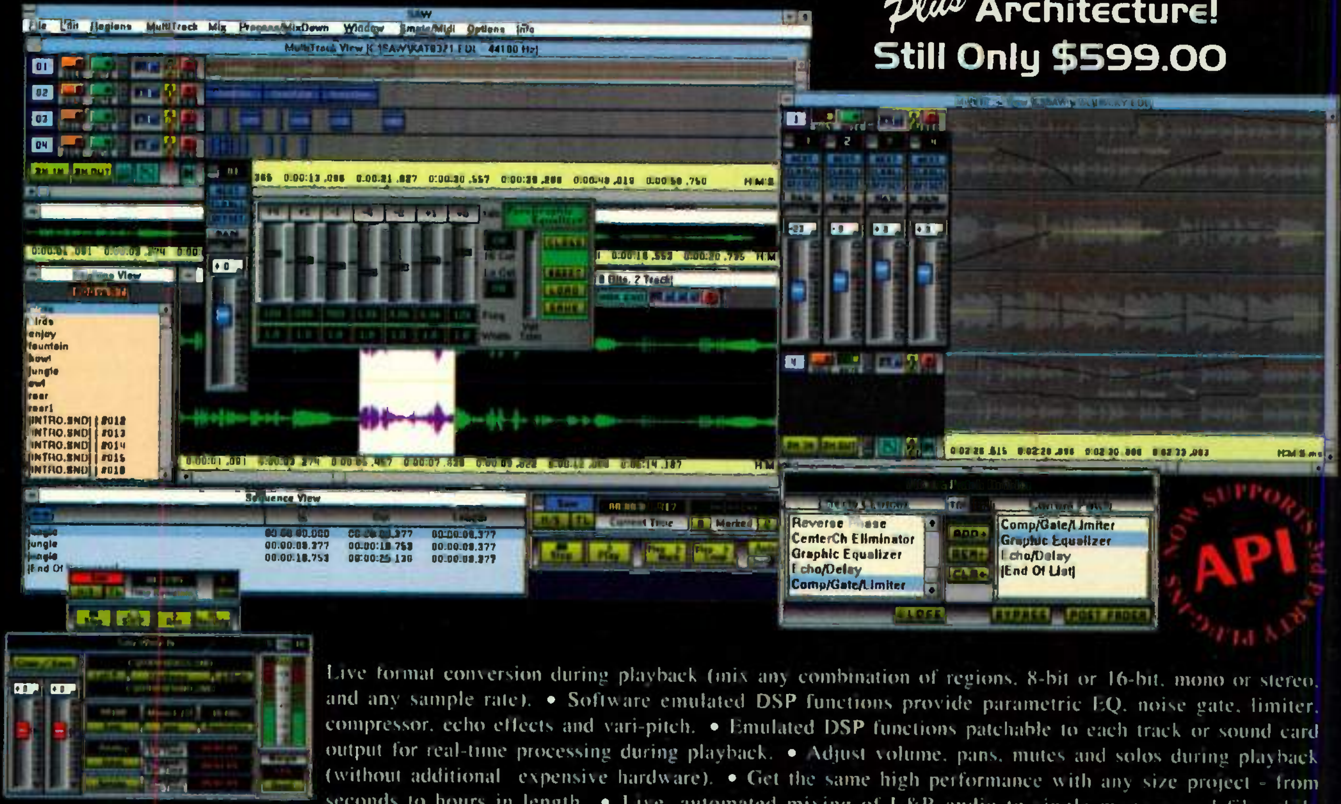
THE NEXT GENERATION...

SAW

Software Audio Workshop

VERSION 6.0

NEW & IMPROVED!
Completely Rebuilt Using the *Plus* Architecture!
Still Only $599.00



NOW SUPPORTS API 3rd PARTY PLUG-INS

Live format conversion during playback (mix any combination of regions, 8-bit or 16-bit, mono or stereo, and any sample rate). • Software emulated DSP functions provide parametric EQ, noise gate, limiter, compressor, echo effects and vari-pitch. • Emulated DSP functions patchable to each track or sound card output for real-time processing during playback. • Adjust volume, pans, mutes and solos during playback (without additional expensive hardware). • Get the same high performance with any size project - from seconds to hours in length. • Live, automated mixing of L&R audio to single mono sound file while recording. • Live, automated splitting of L/R audio to two mono sound files while recording. • Programmable Function Key Views provide fast access to multiple workspaces. • Supports up to two stereo sound cards for a maximum of 4 inputs and outputs. • Record direct to MultiTrack or to sound file only.• MultiTrack Edit Tools provide quick segment splicing or removal functions. • Simultaneous playback of up to 4 mono OR stereo tracks (8 tracks max). • Mix changes automatically recorded for exact duplication during playback. • Separate master volume controls for each sound card output. • SMPTE sync & generate capability with sub-frame accuracy. • Realistic segmented bar graph meters in record panel with peak hold. • Simultaneous Sync Record/Play (sound card dependent). • Non-destructive Region & Play Sequence list editing. • Backup & restore entire editing sessions with an audio DAT. • Complete Drag and Drop, non-destructive editing. • Supports both WAV and SND sound file formats. • MIDI Region & MultiTrack trigger capability. • Adjustable MultiTrack display width. • Multiple Levels of Undo. • Loop Scrubbing, and much, much more!

For Even MORE Power:

SAW *Plus*
Software Audio Workshop

Simultaneous playback of up to 16 mono OR stereo tracks (32 tracks max).

Supports up to 4 stereo sound cards for a maximum of 8 inputs and outputs.

An alternative choice to products costing thousands more... Only $999.00

INNOVATIVE
QUALITY
SOFTWARE

4680 S. Eastern Ave., Ste D
Las Vegas, NV 89119

Tel (702) 435-9077
Fax (702) 435-9106
BBS (702) 435-7186

Visit us on the web:
http://www.iqsoft.com/
Email: info@iqsoft.com

CIRCLE 37 ON FREE INFO CARD

WRH

Missing the Good Ol' Days

...And how to patch things up digitally and, more important, cheaply

BY ROGER NICHOLS

When I was growing up, the statement, "There's a rumble down the street!" meant that there was a fight, usually between two rival car clubs. I was a member of the Quarter Kings of Ontario, California and displayed my car club plaque in the back window of my blown, injected '57 Chevy. The rival car club at the time was the Forty Niners of Upland, California. We never had any knock-down drag out fights, but we used to drag race on back roads a lot.

Nowadays a rumble down the street refers to someone in a Honda Civic with the backseat full of subwoofers and the trunk full of amplifiers. A drag race probably means guys running in high heels and dresses. Times have changed.

Studios and studio equipment have changed, too. Dolby A noise reduction used to take up seven rack spaces for each pair of channels, and now you can get 24 channels of Dolby that will fit inside the tape machine. Mitsubishi 32-track digital machines used to cost $160,000 and now used ones can be found for the same price as 32 channels of TASCAM or ADAT. Many project studios have more tracks of digital audio than lots of commercial facilities.

In the category of outboard gear, I see two things happening. On one hand, we have more and more sophisticated outboard reverbs and signal processors getting ever more powerful. On the other hand, we have a rising lust for old outboard gear that 10 or 15 years ago could be found in junk heaps and electronic salvage dealers. Fifteen or 20 years ago, Pultec, Langevin, API, UREI, Gotham, and similar marquees branded the faceplates of outboard gear in most of the major studios. As newer gear came out, the old gear was replaced. It was not until the digital age that we realized what we really had in these junk heaps.

All of the early outboard gear was made with discrete components that were hand wired. Sometimes the components had to be hand selected to attain the desired performance. Many pieces of outboard gear utilized tubes instead of transistors. Tubes sounded different than transistors, and there were fans of both. Tube gear sounded warm, gave off plenty of heat in the winter, and could always double as a boat anchor. Transistorized equipment ran much cooler, required less maintenance, and took up less rack space. The war between tubes and ICs hasn't stopped yet.

Many pieces of vintage outboard gear added their own unique character to the sound. With digital recordings, it was now easier to preserve this character on tape. Now it is easier to hear the difference between a $5000 tube mic preamp and a $500 tube mic preamp. It is also easier to hear the difference between a Pultec EQ and the "hot" EQ of the moment. When using tube compressors, the operative word to describe the way it sounds is usually "nice."

The bottom line here is that as some people upgrade their studios to incorporate new whiz bang outboard gear, they may be throwing the baby out with the bath water. If they don't want the old UREI 1176 limiters or API EQ modules, maybe you can take them off their hands for a reasonable price. This doesn't happen all of the time, but I see it once in a while, usually when a friend of mine calls me up to brag about the Pultec he found in a pawn shop for $75, or the perfect Neumann U87 for $40. Keep your eyes open. Check out out-of-the-way pawn shops and classified ads in those little weekly papers. Your studio full of quality used gear could be the envy of the neighborhood. If you run across something and you don't know what it is, e-mail me or ask on rec.audio.pro on the Internet. Somebody will know what it is. Don't tell them where it is, though, or it might not be there when you go back to get it.

PATCHBAY FOR PENNIES, FROM NICHOLS

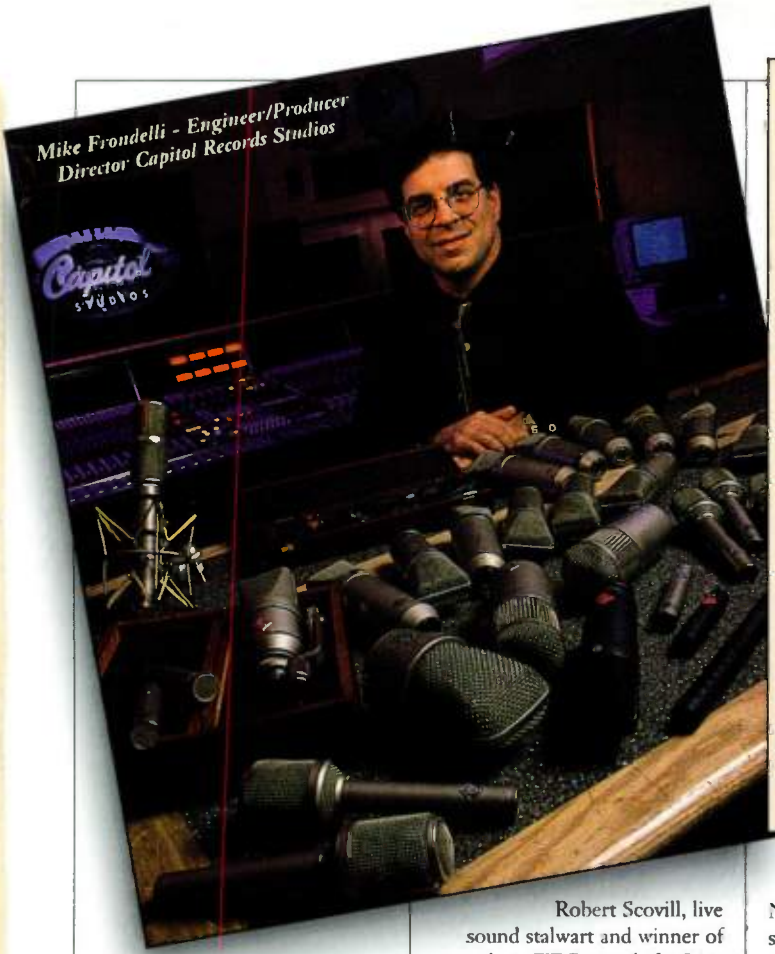
How many of you wish you had a digital audio patchbay to route all those AES signals around? Raise your hand if you do. OK, now how many of you really raised your hand? *You're reading a magazine! I can't see you raise your hand.*

I have a Z Systems 8.8 digital audio de-tangler. I have it hooked up to the eight most-often switched pieces of digital gear. But there is always more gear than switch points. I could get the 16.16 or the 32.32, but then none of you would speak to me any more. So, I was rummaging around the used electronic junk house in Nashville and found a 10base-T Ethernet patchbay. It uses those connectors that are like the ones on the end of your telephone cord except they have eight pins (RJ-45) instead of four (RJ-

continued on page 144

TWO PROS WHO KNOW GREAT SOUND.

TWO MICS THAT MAKE THEM VERY HAPPY.



Mike Frondelli - Engineer/Producer
Director Capitol Records Studios

Mike Frondelli, Director of Capitol Records Studios, has a connoisseur's mic locker, including more than 50 Neumann mics dating back to the 1940's. Newest in the collection? The mic Mike calls "the working man's Neumann," the TLM 193. Because it sounds so good in so many applications, Frondelli recommends the TLM 193 as "the one mic to have" for Capitol acts setting up project studios.

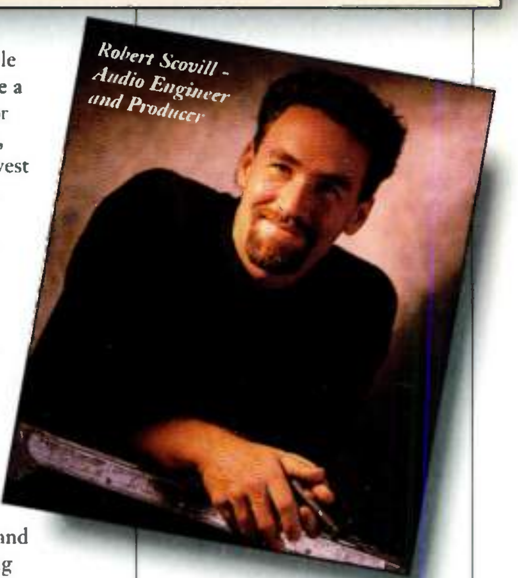
The TLM 193 is a stripped down, cardioid-only version of our famous TLM 170. It provides oodles of headroom, has virtually no self-noise, and can immediately give your project studio that professional sound (particularly on vocals) that you've been missing. (By the way, the TLM 193 has become our biggest seller.) It carries a retail price of less than $1500.

TLM 193

Robert Scovill, live sound stalwart and winner of three TEC awards for Live Sound Excellence, knows a great microphone when he hears one. He has toured as the front-of-house mixer with bands like Rush, Def Leppard and most recently Tom Petty.

"I am using the new KM 184 both out on tour and at MusiCanvas." (Robert's studio in Scottsdale.) "The KM 184 carries all of the Neumann signatures, and I have had great success on a wide variety of sources, from the subtleties of violin to the extremes of distorted guitar."

The KM 184 is perfect for instruments of all kinds, and excels at overhead drum miking and capturing the elusive acoustic guitar. For professional quality at less than $700 each, a stereo pair of KM 184s can easily be a part of ANY studio.



Robert Scovill - Audio Engineer and Producer

Let's face it. While Neumann mics have a stellar reputation for rich, opulent sound, they are not the lowest priced mics around. Why? Because we have to ensure that our microphones satisfy even the most demanding engineers in hyper-critical recording environments. But, we *have* found a way to take a few of the bells and whistles off a couple of our mics and still give you that big (HUGE) studio sound on a project studio budget.

The bottom line is this: before you go dropping big cash on outboard gear trying to make your studio sound good, consider the most important part of the signal path, your microphones. The only way to get great sound *out* of your studio is to *capture* great sound. And no other microphone captures sound as well as Neumann . . . not even close.

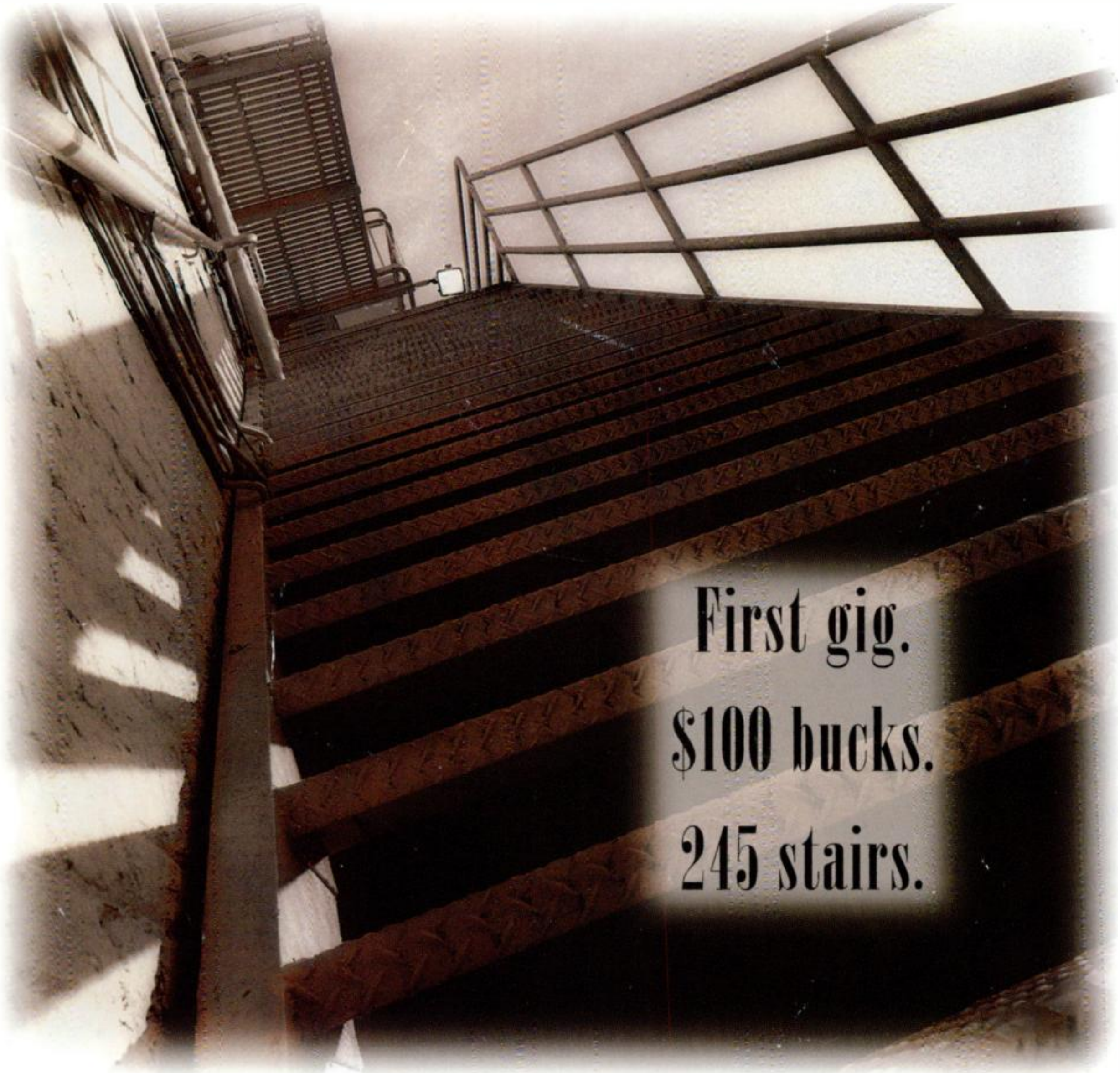
KM 184

Neumann|USA

6 Vista Drive, PO Box 987
Old Lyme, CT 06371
Tel: 203-434-5220 Fax: 203-434-3148

In Canada: 221 LaBrosse Ave.,
Pte-Claire, PQ H9R 1A3
Tel: 514-426-3013 • Fax: 514-426-3953

CIRCLE 58 ON FREE INFO CARD



SOMETIMES THE DIFFERENCE between taking a gig and not taking it isn't the money. Or the exposure. But the schlep. Which is why we created the new EON Portable System. At about half the weight of any other system, it's made to be portable. Yet it gives you all the sound quality and reliability that JBL is known for. At a price that is noticeably lighter. In fact, it may be the perfect first step for any rising star who's just starting out. And plans to get to the top.

EON™

JBL

SOUND THAT CARRIES

H A Harman International Company

WRH