PRODUCTS IN REVIEW: TL AUDIO • LEXICON • STEINBERG/JONES
AMEK • SYMETRIX • SONIC FOUNDRY

EQ

THE PROJECT RECORDING & SOUND MAGAZINE

1995 • ISSUE FOUR

TAKING IT TO DISC

Special Report on Project Mastering by Bob Ludwig, Roger Nichols, and More

- The Art of 2-Track Recording
- Tom Jung's ProMix Sessions
- Personal Monitor Mixer Roundup

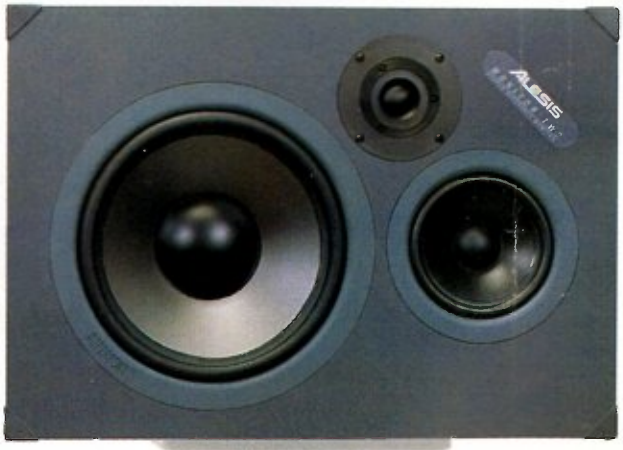
0 71896 47438 1 04 >
$3.95
Can. $4.95
U.K. £2.60
April 1995
Display Until
5/1/95

EQ LIVE

Unsung Heroes of Live Sound

World Radio History

THE BIG PICTURE



The world's best studio monitors are like a picture window. If they perform with accuracy and transparency, you'll not only hear the mix, you'll see it. The new **Alesis Monitor Two™ Studio Reference Monitors** do just that.

Their sonic character was modeled after our TEC Award-winning Monitor One™, so you can mix on either speaker, in any size room, and get the same results. The difference? The Monitor Twos create a larger sound field, the sweet spot is bigger, bass response is deeper, and power handling is greater.

MONITOR TWO™
STUDIO REFERENCE MONITOR

Our design team's 35 years of experience has produced a remarkable crossover design with super-low phase and amplitude distortion. This unique asymmetrical network combines 2nd and 3rd order filters with crossover points at 1.5kHz and 5kHz. And to top it off, a new silk-dome tweeter delivers sweet, natural sound without the harshness that produces ear fatigue. So you can do marathon mixes and still make decisions that translate.

Monitor Twos are perfect for near to mid field monitoring in project studios, mixing suites, and even large control rooms. Or put them in your personal studio to make it sound virtually cinematic. Their combination of civilized size and serious muscle is due to our exclusive SuperPort™ bass venting technology that delivers accurate low end transients equal to much larger, more expensive systems. In fact, the Monitor Twos cost less than some near field monitors. Which makes the case for owning them, sort of...full bandwidth.

Award winning design team, 40Hz - 18kHz frequency response, 200 watt peak power, mirror-image sets, fun to touch non-slip rubber laminate on the cabinet, and a lot more. For mixes you can see. The Monitor Two is at your Alesis dealer now.

For more information about the Monitor Two, see your Authorized Alesis Dealer or call 1-800-5-ALESIS.
Monitor Two, Monitor One and SuperPort are trademarks of Alesis Corporation. TEC Awards are presented by the Mix Foundation for Excellence in Audio.

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016 1-800-5-ALESIS ALECORP@Alesis1.usa.com

CIRCLE 05 ON FREE INFO CARD

World Radio History

HE DOES RAP N' ROLL.

HE DOES ACID HOUSE. HE DOES CHOIR.
HE DOES JAZZ. HE DOES POP. HE DOES COUNTRY[?]
HE DOES BLUES. HE DOES SOUL.
HE DOES ZYDECO. HE DOES AMATEUR NIGHT.
IN FACT, THE ONLY THING HE DOESN'T DO IS POLKA.

YET.

AS HOUSE ENGINEER FOR THE APOLLO THEATRE IN N.Y., SCOOTER SCOTT HAS DONE IT ALL WITH TRI-POWER. IN FACT, THE ONLY THING THAT KEEPS HIM FROM DOING POLKA, TOO, IS AN ANGRY MOB. TRI-POWER. IT CUTS THROUGH THE MUSIC.

AKG

H A Harman International Company

AKG, 8500 BALBOA BLVD., NORTHRIDGE, CA 91329 USA PHONE 1·818·894·8850 FAX 1·818·830·1220 FLASH FAX 1·818·895·8188 ID# 965

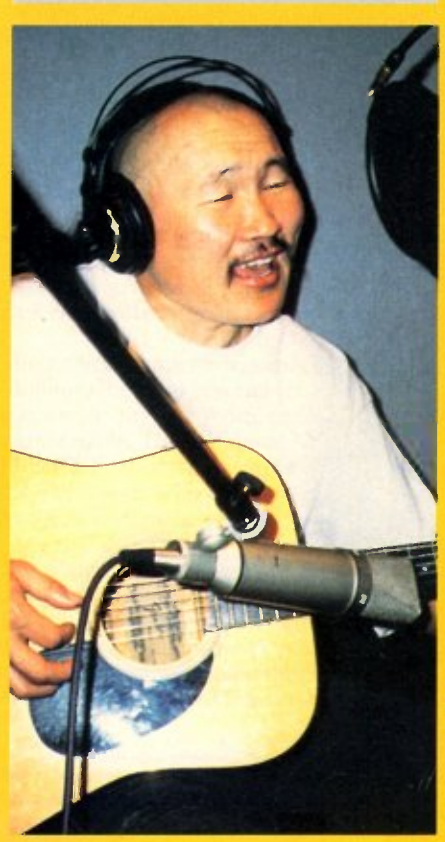
World Radio History

EQ

PROJECT RECORDING & SOUND TECHNIQUES

VOLUME 6, ISSUE 4

APRIL 1995



FEATURES

MASTERING IN THE PROJECT STUDIO 60

EQ presents a look at the latest techniques and technology that you need to know to make a successful master. Stories include:

• **WHAT YOU SHOULD KNOW ABOUT MASTERING (BUT TEND TO FORGET)** *By Bobby Owsinski* 62

The title says it all. An overview of mastering, including what it is and why you need it.

• **SOME THOUGHTS ON MASTERING 1995** *By Bob Ludwig* 68

The master masterer himself discusses how you can make the masterer's life easier — and in turn get the sound you've been looking for.

• **PROJECT RECORD CO. IN A BASEMENT** *By Roger Nichols* 74

Get noticed with a professional-looking product — and do it yourself from concept to CD.

• **REPLICATION MADE EASY** *By Ellen Threatt* 82

How to work with your replicator to get the job done right.

• **MASTER(ING) PIECES** 86

A selection of mastering tools to add to your equipment arsenal.

LEXICON PCM 80 REVIEW *By Howard Massey* 88

The successor to the popular PCM 70 has arrived. Find out if it's right for your rack.

EQ LIVE

SPEAKER DESIGNERS: THE UNSUNG HEROES OF LIVE SOUND, PT. 1 *By Steve La Cerra* 97

NEW GEAR FOR YOUR NEXT GIG 102

GET OFF YOUR FEED(BACK) 106

ROAD TEST: TL AUDIO DUAL-VALVE EQ *By Zenon Schoepe* 106

TECHNIQUES / WORKSHOPS

THE PROMIX EXPERIMENT *By Tom Jung* 40

SCANNING THE PERSONALS (MONITOR MIXERS) *By Wade McGregor* 46

2-TRACK RECORDING: IT TAKES TWO *By Bruce Bartlett with Jenny Bartlett* 54

COLUMNS / DEPARTMENTS

MI INSIDER: DOING WINDOWS 95 *By Craig Anderton* 36

DETAILS ONLY: SITE SELECTION FOR STUDIOS *By John Storyk* 124

FAST FORWARD: DEATH AND TAXES *By Martin Polon* 130

MAINTENANCE: TRUE CONFESSIONS *By Eddie Ciletti* 140

ACROSS THE BOARD: DIGITAL RAMBLINGS *By Roger Nichols* 146

LETTERS TO EQ 6

EQ&A 10

PRODUCT VIEWS 16

STUDIOWARE 20

ROOM WITH A VU: JON ASTLEY 24

MICRO-PHILE: ELECTRO-VOICE RE2000 26

FIRST LOOK: AKAI DR8 30

EQ TRACKS: MARY CHAPIN-CARPENTER 32

EQ PEOPLE: JEFF LORBER 34

IN REVIEW: SYMETRIX 488 DYNA-SQUEEZE 110

IN REVIEW: STEINBERG/JONES ADAT INTERFACE 112

IN REVIEW: SONIC FOUNDRY SOUND FORGE 3.0 114

IN REVIEW: AMEK 9098 EQ 118

AD INDEX 131

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

Cover photo by Dennis Griggs

World Radio History

WITH WORD-OF-MOUTH LIKE THIS, WHO NEEDS AN AD AGENCY?

"The ProMix 01 gives me the flexibility to control all the elements of a show from my computer. Superb sonic quality and remarkable features, you just can't beat it."

- Stan Miller, Sound Designer, Neil Diamond Tour

"I bought four of them for the Steely Dan Tour, and I haven't shut up about the 01 yet."

- Roger Nichols, Engineer, Steely Dan

"Bottom line, the ProMix really does live up to all the hype. It's very quiet, it sounds great, it operates very cleanly." "One of the most amazing introductions in years."

- Recording Magazine, October 1994

"I did my latest project on the ProMix. And it's one of my best sounding yet. The ProMix 01 is really great!"

-Hans Zimmer, Composer, The Lion King

"ProMix 01 stands every chance of becoming a landmark product, changing the way a lot of people currently work."

- Studio Sound And Broadcast Engineering, July 1994

"We're not normally violent, but in this case, we're willing to make an exception. We're not letting this mixer go."

- Mix Magazine, November 1994

"Premium sound quality with all the trimmin's. Yamaha has come through again."

- Steve Porcaro, Songwriter/Musician/Producer

"As a sound designer, I create illusions. Yet, the power and flexibility of the ProMix is no illusion. It most certainly contributes to the prestige of Machine Head."

- Stephen Dewey, Sound Designer/Founder, Machine Head

"After working with ProMix 01, I am convinced its sound, quality and flexibility rivals that of mixing consoles costing many times more."

- Calvin L. Harris, Engineer/Producer - Lionel Richie, Diana Ross, Stevie Wonder

"My two ProMix 01s store all the parameters of my mix and play it back exactly as I heard it at the moment of creation. More importantly, they sound great!"

- David Schwartz, Composer for Northern Exposure

"Yamaha has done it again, just as it did in the early '80s with the DX-7 keyboard. It has created a cool piece of gear that does more, does it better, and costs less."

- EQ Magazine, December 1994

"It took Yamaha to create a brilliant sounding digital mixer with full MIDI control. I have no doubt that the ProMix 01 will quickly become an industry standard."

- Jeff Bova, Keyboardist/Arranger/Composer - Vanessa Williams, Robert Palmer

"Clean, quiet, powerful. The best words I can think of to describe the ProMix 01, the latest addition to my toolbox."

-Tom Jung, Producer/Engineer/President, DMP Records

If you think the ProMix 01 sounds good here, wait 'til you hear it in action. Call our 800 # and send for your free CD of The ProMix Sessions, produced and engineered by Tom Jung, President of DMP Records. Our ad agency thought we needed to say something clever here, but we told them we had enough opinions already. To order your CD, call 1-800-937-7171, Ext. 450.

YAMAHA 20 BIT TECHNOLOGY

YAMAHA®

Smart Mixing.

Ext. 1-800-937-7171 450

© 1995 Yamaha Corporation of America, Pro Audio Products, P.O. Box 6600, Buena Park, CA 90622. (714) 522-9011. Yamaha Canada Music Ltd., Scarborough, Ontario M1S 3R1. (416) 298-1311.

CIRCLE 74 ON FREE INFO CARD

World Radio History

EQ

A PSN Publication
Vol. 6, No. 4
April 1995

PAUL G. GALLO
Publisher/Editorial Director

KATHLEEN MACKAY
Associate Publisher

HECTOR LA TORRE
Executive Director

MARTIN PORTER
Executive Editor

ANTHONY SAVONA
Managing Editor

CRAIG ANDERTON
Technology Editor

STEVE LA CERRA
Senior Editor

DENISE MCMUNN, LIANA JONAS
Associate Editors

MELISSA HUNTER
Assistant Editor

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

MP&A EDITORIAL
Editorial/Design Consultants

MATT CHARLES
Sales Manager

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

RIVA DANZIG
Creative Director

MARK ALHADEFF
Art Director

SUSAN FALCO
Assistant Art Director

FRED VEGA
Production Manager

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

Administrative/Sales Offices
2 Park Avenue, Suite 1820
New York, NY 10016
Tel: (212) 213-3444, Fax: (212) 213-3484

BPA INTERNATIONAL®

EQ (ISSN 1050-7868) is published monthly exept for July and November by P.S.N. Publications, 2 Park Avenue, Suite 1820, New York, NY 10016. Second class postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. 1 yr. $24.95, 2 yrs. $39.95, 3 yrs. $59.95; CANADA add $10 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.**

BURN THE BRA

Re: Letters to EQ, March '95. Lisa Johnson is right on the money in every way. None of the magazines that have published this Symetrix ad should have ever accepted it. It's cheap, dumb, and dated.

When I saw this ad it caught my attention, and I thought, "Turn the page, they're desperate for attention." Based on just this ad, I'd never buy a Symetrix product if someone else made a device that could replace it. Not everyone will think that way, but I'll bet I'm not the only one.

EQ Magazine, last I looked, was not the Sunday paper, *Gourmet, Seventeen,* or *Vanity Fair.* It is a specific technical journal (not a general-interest paper) that carries respect in both its articles and ads. It cannot be compared to any of the aforementioned printed media other then the fact that it is printed media.

Symetrix said they spent $50k on that ad (oh brother). I doubt if any of the advertisers spend quite that much on an average ad. If Symetrix is worried about getting in their .4 seconds of fame, perhaps they should look at some of the other ads in your magazine that have class.

Peavey's monitors (note the gray-speckled texture of the cabinets), Spirits' PowerStation (recognizable layout, colors, and fonts), various Alesis ads (benefiting from the same distinctive points as the Spirit ad), Mackie (busy with tons of info that reads like a little article), Rupert Neve on his bike, KRK (great jump out art), and the list goes on.

I don't think that Lisa or anyone else wants "ideas filtered" in *EQ.* Let's not confuse ideas with selling. There are better ways of getting attention, as those other ads exhibit.

Fritz Lang
via America Online

OFFENSIVE LETTER

I just finished reading the Letters to EQ in the March '95 issue and, following the politically correct movement, I found more "insensitive" ads:

- The Spirit PowerStation ad may offend the Daughters of the American Revolution.
- The Amek 9098 ad may offend bikers.
- The D&R ad may offend visually impaired people.
- The KRK ad may offend Peruvian indigenous people.
- The RSP ad may offend Greenpeace.
- The Carver ad may offend boxers.
- The AB ad may offend listening-impaired people (and crash-test dummies).
- Your graphic of Lenin may offend former and current Communists.
- Your graphic for the nearfield monitor auditions may offend PETA.
- Roger Nichols's article may offend his neighbor and Steve St.Croix.

But the thing that did tick me off was that letter from Ms. Johnson. She is afraid that male engineers will jump from their chairs and attack every female in sight after looking at the Symetrix ad. Or worse, that male engineers will not value their female counterparts as true professionals. I have news for her, those of us who have been in the business for a while don't care for male/female, earthling/alien, gay/straight, black/ white controversy. We are so used to seeing crap that when a true professional shows up, we don't care if it is a gay Martian Fuchsia Platypus, we respect him or her for their abilities, the rest is decoration. Ms. Johnson, next time have a little more respect for your colleagues, we are not morons.

Miguel Gonzalez
Le Garage Studio
via America Online

SHOCKING!

I was shocked and horrified to see the number and magnitude of the technical errors in Eddie Ciletti's new column. He throws around the decibel as a measurement, explaining that it's a ratio value, but nowhere does he point out that in order to specify a value in decibels, one has to give a reference point for that value. For example, 10 dBmV is a value that is ten decibels above a millivolt. To say that a signal is 10 dB alone doesn't mean anything. It could be 10 dB above a volt, 10 dB above a watt, or 10 dB SPL (sound pressure level). No discussion of decibels is complete without mentioning this.

But he appears to have a very fundamental confusion about the nature of the measure, when he says that the consumer gear produces levels that are 14 dB higher than that of the professional gear, because the consumer gear operates at –4 dB, while the professional gear operates at +10 dB. In actuality, the professional gear has a lower output level because it has an

World Radio History

IMPROVE YOUR SONIC LANDSCAPE

for about the price of a weed wacker.

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

dbx

266 COMPRESSOR/GATE

A Harman International Company © 1994 dbx Professional Products 8760 South Sandy Parkway, Sandy UT 84107
Phone 801•568•7660 FAX 801•568•7662 International FAX 603•672•4246

CIRCLE 19 ON FREE INFO CARD

World Radio History

output at +10 dBuV, while the consumer gear has an output at –4 dBmV. These are completely different scales that cannot be compared without using a scaling factor. (Note also that some broadcast equipment uses a third completely different standard.)

Please, if you are going to publish an article clarifying technical points, it would be in your best interest to publish fewer articles that completely confuse the issue.

Scott Dorsey
via America Online

[*Eddie Ciletti responds: My article's intent was to help readers reduce noise by increasing their awareness of gain structure. You are correct about the decibel. It does indeed express the logarithmic difference between two voltages. But I barely had enough word space to create a mental picture of a signal at clipping, the noise floor, and how to find the optimum place in between to set level controls, let alone an in-depth description of the decibel. (All this without a 'scope, an oscillator, or a voltmeter.) I try to encourage ownership and use of test equipment. This stuff can cost as little as $750, but that's the cost of a 16-input mixer in the project environment.*

The horrors of number and magnitude are actually in your response. While +10 and –4 are real places in the land of the dB, they were in no way specified in my article. There is, however, a real 14 dB difference between +4 (pro levels) and –10 (consumer levels) no matter whether your reference is 0 dBm (.775 volts RMS into 600 ohms), 0 dBu (.775 volts into a high impedance load), or 0 dBV (1 volt RMS into a high impedance load).]

HUM BUG

A couple of years ago I bought a BBE Sonic Maximizer 422A and a DigiTech DSP128. I had a noise problem with them that I fixed, and thought I'd pass the solution onto the readers of *EQ*.

I realized that not all of the low-frequency sound that came out of the Sonic Maximizer was synthesized bass sound (one thing it is supposed to do), there was a silent 50 Hz hum as well. The same went for the DSP128. After an investigation I found out that it was the transformers that were humming. The magnetic/hum fields around the power transformers "radiate" about a foot or so.

In the Maximizer, it was a ±15 V transformer and in the DSP128 it was a ±12 V/+5 V transformer. So away I went to my favorite store where I bought new toroidal transformers, some fuseholders, some power switches, some nice boxes to hold the new stuff, some power connectors, and some new capacitors, plus some power filters to make the power spikes stay on the outside of my new AC power supplies. Then I removed the old transformers from the processors and soldered a new power supply cord to the PCBs. I made a bigger hole on the back of the processors to hold the new power connector. Then I built the two new power-supply boxes including the new power switch. I inserted fuseholders on both sides of the transformers. I made a square hole for the power filters. I even quadrupled the size of the capacitors that sit just after the DC-power diodes (still in the processors), but I don't know if they made any difference. In other words, I made a completely new AC power supply for the processors. The transformer was removed from the processor, the DC part is still the same.

A couple of things are important:

• Build a separate box for the transformer (AC power supply), so that you may store it a few feet away from the processors. The Toroidal (or round) transformers have a lower magnetic field than the old conventional (square) have.

• My DSP128 did not have any fuses (European model?), so I think it is important that you insert these. In my case, I put four in. One in the 220 V (primary) side (in Sweden we have 220 V in the wall), one on the +5 V output, and one each on the ±12 V.

• It is the +5 V that draws the most power in the DSP128, so be aware of the size of the fuse. I inserted a 500 mA on the primary side, but it blew so I inserted a 1A and it seems OK.

• Since the Toroidal transformer is a bit more sensitive to noise from the power outlet, I thought that a power filter should be used.

So at last, when replacing the internal transformer (AC power supply) with an external transformer stored a few feet away, I got a better sound from the processors. The result was much less 50 Hz (60 Hz in U.S.) hum coming from the processors. It gives a much cleaner signal when you are recording or mixing. It may also extend your life of some of your stuff.

This may cost you a bit of money, but this is worth a try (but *only* if you do know what you are doing). [*Needless to say, Mr. O, your warranty is cancelled! —HGL*]

Urban Osterman
Sweden

OMIT ONE

I just received the March '95 issue, read Craig Anderton's DIY article "Make a Universal Cable Tester," and felt I had to write you regarding an oversight in the instructions. Craig recommends using an aluminum minibox or rack-mount construction for the project. What he neglected to point out is that standard 1/4-inch, 1/8-inch, and RCA panel jacks all have their ground connections integral to their chassis mounts. Unless you use either a nonconductive (plastic or phenolic) mounting surface for these connectors or carefully isolate the grounds from the chassis, you will always get a positive ground connection reading, *even with no cable connected.* Since open grounds are a common fault, and one that can be tricky to diagnose operationally, I think this is an important point to clarify. I've enjoyed Craig's projects and articles for many years, and am sure this fact is as obvious to him as it was to me, but I think many of your readers will benefit from this clarification. Still, in these days of "swap-out-the-board" maintenance, I'm glad to see more DIY articles in your magazine. Keep up the good work!

David Avidor
Huntington, NY

[*Craig Anderton responds: In the words of Homer Simpson, "Doh!" Jacks are available with insulated bushings, or you can mount the jacks on a piece of phenolic or plastic, cut a hole in the rack panel, then attach the piece of plastic to the rack.*]

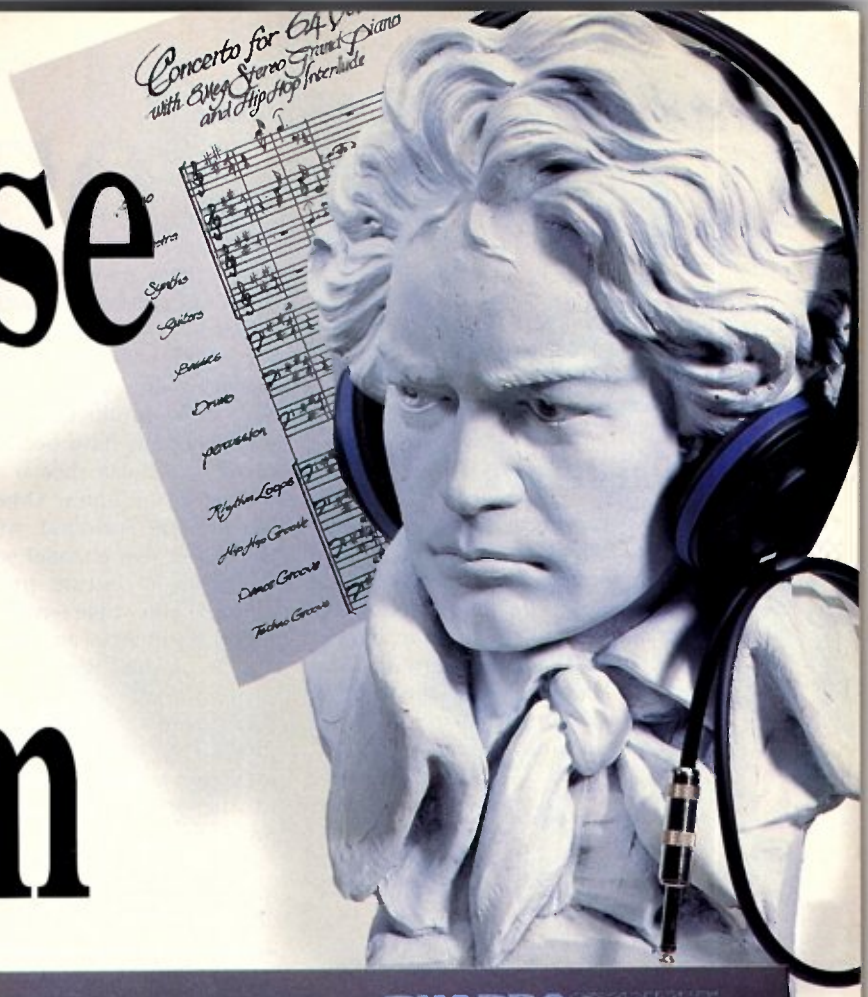
WRITE US!

Send all your thoughts, queries, comments, tips, ideas, praise, jokes, and gifts to:

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

World Radio History

Compose Record Perform



QuadraSynth

PLUS PIANO

Beethoven didn't hit *all* the notes. There's still a whole lot of music left to carve out there. And you'll hear every note on the *all new* **QuadraSynth Plus Piano**™. Its true 64 voice polyphony drives 24 Meg of sample ROM featuring superb digital, classic analog, realistic instrument samples and the world's only built-in 8 Meg, phase-accurate stereo piano. The one everybody's been talking about. That is, when they're not playing it.

There's powerful real-time control, a massive onboard library of 640 *all new* Programs and 500 multitimbral Mixes. Slide in one of our QuadraCard™ RAM cards for simultaneous access to 1152 Programs and 900 Mixes, or one of our QuadraCard ROM cards for a wide variety of Orchestral, Pop/Rock, Dance, and Ethnic timbres. There's the ADAT® Optical Digital Output, built-in effects with 4 independent multieffects busses and our free Sound Bridge™ software for converting your own samples into QuadraSynth format. Genius is yours.

QuadraSynth Plus Piano is the most powerful production keyboard available. We wouldn't want it any other way. After all, geniuses have a lot of work to do. Your Alesis Dealer will be happy to show you the way.

For more information about the QuadraSynth Plus Piano, see your Authorized Alesis Dealer or call 1-800-5-ALESIS.
QuadraSynth Plus Piano and QuadraCards are trademarks, Alesis and ADAT are registered trademarks of Alesis Corporation.

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016 1-800-5-ALESIS ALECORP@Alesis1.usa.com

ALESIS
STUDIO ELECTRONICS

CIRCLE 03 ON FREE INFO CARD

World Radio History

YOU'RE SURROUNDED

Q I have a project studio, and a couple of my clients have asked me to mix their spots in surround. I've looked into available production systems to buy or rent and read some literature, but I'm still confused. What's up with all these formats? If I buy into one system, can I be assured of compatibility with any or all of the other systems?

Estéban Rosário
Río Piedras, Puerto Rico

A We should quickly establish that surround is currently divided into two mediums: digital and analog. Digital is, at this point, strictly a theater phenomenon, and will likely remain so until the time High Definition TV invades a majority of our homes

Analog surround is project studio territory. Analog surround essentially came into being in the late '70s, when it was developed by Shure Laboratories as an outgrowth of and an improvement upon ill-fated Quad. Over the past few years, Dolby Labs has taken the lead with surround, especially with their Pro Logic chip, which has been licensed to many consumer manufacturers and has benefited from some extremely effective marketing. Hence, the proliferation of surround systems and componentry available to the consumer arena, and hence the growing market.

Production procedures for surround are actually quite simple. Surround is an encode/decode process. Signals are sent from an audio mixer to an encoder, which configures those signals for Left, Center, Right, and Surround positions. These signals are in turn decoded and sent to their appropriate amplifiers for placement in the surround soundfield.

Given this simple set of parameters, it's safe to say that there is compatibility among all of today's analog surround systems. If you, as a producer, use one manufacturer's encoder, you can expect your material to be properly decoded through another manufacturer's decoder so long as any particular limitations of that decoder are observed in the production process. To cut to the chase: there are no compatibility problems among today's analog surround production systems.

This is not to say there are not differences in features and orientation among surround production componentry. Some systems have been designed primarily to simulate theater surround conditions in the home. Others (including RSP's Circle Surround, with full bandwidth and rear channel separation) are intended for music production and reproduction, while remaining appropriate for commercial and film surround.

(A hidden benefit of surround is present to all systems: anything properly mixed in surround is inherently phase cohesive, and therefore ready for stereo and mono broadcast. Stereo, on the other hand, traditionally has presented nightmares for broadcast.)

The bottom line is that you can't go wrong. Format compatibility is not an issue, pricing is generally appropriate to project studio budgets, and it's the next frontier. If you want to increase your client base, now is the time to get involved with surround.

Bill Rowe
Sales Manager
RSP Technologies

SUB STANDARDS

Q I am a soundman for a band that's going on the road. We'll be playing clubs seating approximately 350-1500 people. We want to add subwoofers to our FOH system. Are there any rules of thumb for matching subs to a FOH system?

Buddy Tomaino-Overholt
Brick, NJ

A You first need to determine how to match the output levels of the new subwoofers to your existing system. In order to do so, you'll need a calculator with a "log" function and the power handling capacity and sensitivity rating of the full-range speakers. Different manufacturers rate power handling and sensitivity in different ways, so be sure you're comparing ratings that are based on similar standards. Look for a continuous power, pink noise, or "AES Standard" rating. Sensitivity is given as a level in decibels (dB) measured at some distance from the front of the speaker (usually one meter) at some power level (usually one watt). To calculate the maximum output level of the system, multiply the log of the power handling by ten and add this to the rated sensitivity. Do the same for the subwoofer you are considering and compare the results. Here's an example: Let's say our speaker has a rated sensitivity of 95 dB 1 watt/1 meter and a rated power handling capacity of 100 watts. Enter 100 into the calculator and press the "log" button. The result is 2. Multiply by 10 and the result is 20. Add 95 to 20 equaling 115, and there we have the output in decibels of the speaker (at one meter) when fed 100 watts of power.

You don't need to buy one subwoofer for every full-range box in your system. If there are multiple full range boxes, the number of subwoofers can be reduced.

Because they operate at frequencies with very long wavelengths, multiple subwoofers tend to exhibit "mutual coupling" when the distance between drivers is less than about one-half wavelength. (Wavelength of 100 Hz is about 11 feet.) This means that two subs, next to each other will have 6 dB more output than one. Three dB of this comes from doubling the power capacity (by doubling the number of drivers) and the other 3 dB is the result of mutual coupling.

Placement is also important. Since subs are basically omnidirectional, most of the energy coming out of the box is not being directed where the box is "pointed." A sub hanging in space radiates energy equally in all directions. Subs on the floor, away from a wall, radiate all of their energy into a hemisphere. With the same amount of energy, half the space ("half-space loading"), we get 3 dB more level in the room. If you move the subs to the intersection of the floor and a wall (quarter-space), add another 3 dB. Place them in the corner of the room where two walls and the floor intersect (eighth-space) and get another 3 dB. A total of 9 dB of "free" gain determined by where you put the subwoofer in the room.

Full-range speakers typically do not behave in this way because the wavelengths of the frequencies they are producing are too short to combine effectively. Three dB gain is all you get when you double the number of speakers, this coming from doubling of power handling.

If the full-range speakers have tight coverage patterns that do not overlap, even the nominal 3 dB extra

World Radio History

Compose Record Perform

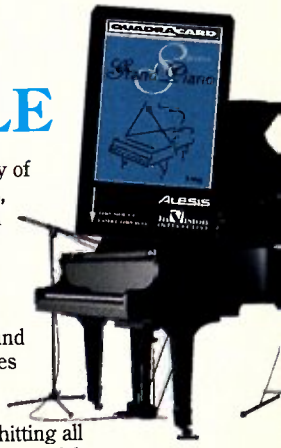
S4 Plus

64 VOICE 20 MEGABYTE EXPANDABLE SOUND MODULE

Beethoven would have loved the 64 voice polyphony of the *all new* **S4 Plus™ 20 Megabyte Expandable Sound Module.** The first sound module with the powerful QuadraSynth Plus sound engine, its true 64 voice polyphony lets you play dense, complicated musical scores without the problems of voice robbing.

The only sound module with the ADAT® Optical Digital Interface for direct digital recording to ADAT, the S4 Plus' 20 Meg sample ROM features the purest digital, warmest analog and most realistic instrument samples available, including GM samples for classic multimedia presentations.

The S4 Plus is the only sound module that plays the amazing QuadraCard™ Stereo Grand Piano - the same one that's in the QuadraSynth Plus Piano. It's the world's only 8 Meg, phase accurate stereo piano available on the powerful and affordable PCMCIA card format. It's been said this is the best sampled piano ever. Could be reason enough to own the Plus.



And there's a lot more. A massive on-board library of 640 all new Programs and 500 multitimbral Mixes, expandable to 1152 Programs and 900 Mixes with our QuadraCard RAM card. 4 independent multi-effects busses and the most powerful modulation matrix available. A beautiful, easy to read backlit custom LCD display brings the whole Plus story right to your fingertips. And, you get our free Sound Bridge™ software for converting your own samples into QuadraSynth format. Genius.

Whether you're scoring films, tracking songs, or hitting all the notes at center stage, the S4 Plus is the most powerful composition, production and performance sound module available. It had to be. After all, there's a whole lot of notes to hear. And play. At your Alesis dealer.

ALESIS STUDIO ELECTRONICS

For more information about the S4 Sound Module, see your Authorized Alesis Dealer or call 1-800-5-ALESIS.
S4, QuadraCard and Sound Bridge are trademarks, Alesis and ADAT are registered trademarks of Alesis Corporation.

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016 1-800-5-ALESIS ALECORP@Alesis1.usa.com

CIRCLE 04 ON FREE INFO CARD

World Radio History

output will be lost. Subwoofers don't have this problem, they're omnidirectional until you start building *very* large arrays with them.

All of this should be tempered by what you'll be using the system for. Rave, trance, and reggae all are going to require a higher subwoofer-to-full-range-box ratio than jazz, rock, or R & B.

Don't get too hung up on extreme low-frequency extension. Very few instruments have any output below 30 Hz and most rooms are not large enough to support propagation of the 56 1/2 foot wavelength of a 20 Hz tone.

Andrew Rutkin
Applications Engineer
EAW

...AND THE PITCH

Q *I've been hearing a lot about the Alesis QuadraSynth's portamento feature, but to me, it basically sounds like the pitch wheels that have been on synthesizers for years. What is the big deal about portamento?*

Bud Spelling
Detroit, MI

A Like its analog ancestors such as the Minimoog and OB8, the QuadraSynth has the ability to smoothly slide between pitches much like the way you can bend notes with the pitch wheel. Listen to Emerson, Lake and Palmer's "Lucky Man" for perhaps the most classic example of the portamento effect.

The QuadraSynth goes beyond its forefathers, however, in that the note that triggers the portamento slide can either be above or below the source pitch (on older analog instruments, only a lower note would trigger the portamento slide). Furthermore, the QuadraSynth allows you to select between three "curves" for your portamento slide: linear, exponential, and one-speed.

The QuadraSynth's portamento effect is available on all of its sounds, both single and multisampled. You can even apply portamento to drum kits for some truly drastic effects.

Basically, the QuadraSynth takes the source sample and interpolates (bends) it by varying its sample playback rate over time, creating very small changes in pitch. The same calculations are employed if you utilize the pitch envelopes, LFOs, or the pitch wheel. The pitch transitions are smooth because the QuadraSynth bends the source sample all the way to the destination pitch, rather than changing samples as it goes up (or down) the keyboard, which would result in a very audible break in timbre.

Check out Preset 127 "PortaWheel" on the QuadraSynth to hear an excellent use of the portamento effect. On this particular program, the mod wheel speeds the portamento rate, so you can set it to your taste or alter it dynamically.

Erik Norlander
Sound Development
Alesis

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

Run Silent, Run Deep

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

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

ASHLY

Ashly Audio Inc., 100 Fernwood Avenue Rochester, NY 14621 • Toll Free: 800-828-6308 • 716-544-5191 • FAX: 716-266-4589
In Canada: Gerraudio Dist Inc., 2 Thorncliffe Park Dr - Unit 22, Toronto, Ontario M4H 1H2 • 416-696-2779 • FAX: 416-467-5819

CIRCLE 13 ON FREE INFO CARD

World Radio History

The gold standard for mixdown.

Ampex 467 R-DAT. Highest consistency, lowest error rates.
No wonder more studios go gold on Ampex than on all other tapes combined.

You've recorded the richest sound possible. Laid down track after track. Spent hours mixing. So why take chances mixing down onto ordinary 2-track tape?

Now's the time to use Ampex 467 R-DAT. Ampex 467 delivers the highest quality and greatest consistency of any mixdown tape. Period.

Maybe that's why more people trust Ampex for their analog and digital needs. Or why more artists, engineers and studios go gold on Ampex than on all other tapes combined. After all, our state-of-the-art, award-winning tapes have set the standard in mastering for decades.

We've even set a new standard for packaging based on your requests for better storage space. Our DATpak® contains space for two tapes, storage room for track sheets and notes, and a plastic lockable tray to store the cassettes. Our new Album DATpak features a tray for 12 R-DAT cassettes and storage room for your project notes and floppies. All in a package that conforms to your studio shelving.

Of course, Ampex 467 is backed by a team of field service engineers known throughout the industry for responsive customer service. For more information, or the name of your nearest distributor, call **800 227-8443.**

Ampex 467. Stay on track for the gold.

AMPEX

Ampex Recording Media Corporation, 401 Broadway, M.S. 22-02, Redwood City, California 94063

CIRCLE 09 ON FREE INFO CARD

World Radio History

Sony Business and Professional Products Group, 3 Paragon Drive, Montvale, NJ 07645-1735. ©1994 Sony Electronics Inc. Reproduction in whole or in part without written permission is prohibited. All rights reserved. Sony is a trademark of Sony.

World Radio History

PORTABLE DAT RECORDERS

PRO HEADPHONES

MR SERIES
SIGNAL PROCESSORS

DIGITAL SIGNAL
PROCESSORS

YOUR MUSIC IS

EVERYTHING

YOU SEE AND FEEL

AND HATE AND LISTEN

TO AND STRIVE FOR

AND TRY TO FORGET IT

AND LEARN TO IGNORE

AND BREATHE AND HOLD AND TOUCH AND CRY OVER AND LAUGH ABOUT AND

TURN AWAY AND LET IN AND TRY AND FAIL AND WANT TO BE AND EVOLVE

INTO AND INHALE OR IN SOME PEOPLE'S CASE CLAIM THEY DIDN'T AND DREAM

OF AND ARE FRIGHTENED OF AND CALL YOUR OWN AND REFUSE TO ADMIT

AND REJOICE IN AND

HIDE FROM AT NIGHT

AND PITY AND SMELL

AND LOVE AND **ARE.**

CD PLAYERS

8-TRACK RECORDER

STUDIO DAT RECORDERS

PRO MICROPHONES

SONY

Let your music be all it can. For information about Sony Pro Audio products, call 1-800-635-SONY, ext. MI.

World Radio History

EQ PRODUCT VIEWS

EIGHT ON THE FLOOR

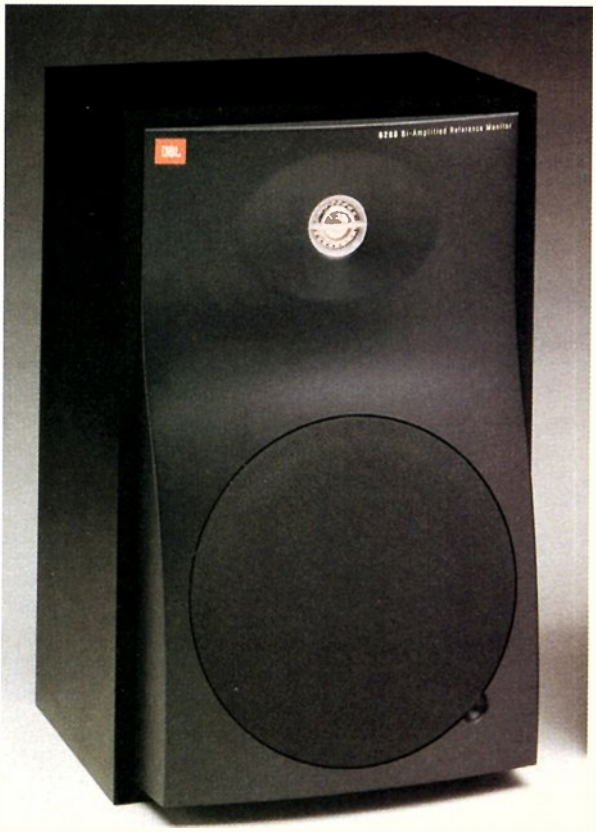
TASCAM is offering a new version of its portable 8-track recorder. The 488 MKII Portastudio provides three bands of EQ complete with sweepable mids on each of the main input channels. TASCAM has also provided auto punch in/out capability, rehearsal mode, and three auto-locate points for engineers with fast fingers. If you set the 488 MKII to MULTI MIX mode, you are now able to mix up to 20 input signals. Separate outputs are offered for input to a stereo master recorder, and there are also sync loop capabilities for ease in synchronizing hardware or software sequencers. There is built-in dbx noise reduction. For details, contact TASCAM, 7733 Telegraph Rd., Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #101.

MORE POWER

Crown has just expanded its CSL series of power amplifiers with the 1400 CSL. This latest addition to the Crown amplifier family cranks out 700 watts per channel at 4 ohms and 500 watts per channel at 8 ohms in stereo mode. In bridge-mono, the 1400 CSL delivers 1500 watts at 8 ohms, and 1075

watts at 16 ohms. And in parallel-mono, it cranks out 1515 watts at 2 ohms, and 1050 at 4 ohms. (All specs are at 1 kHz with 0.1% THD.) Direct-coupled and grounded bridge circuitry are integrated into the 1400 CSL, and they provide a high damping factor of greater than 1000 all the way down to 10 Hz. Also featured in the amp are Crown's forced-air cooling system and Output Device Emulation Protection (ODEP) circuitry. This two-rack-space amp has a retail price of $1375. For more details, contact Crown International, Inc., 1718 Mishawaka Rd., Elkhart, IN 46517. Tel: 219-294-8000. Circle EQ free lit. #102.

BUY BI BABY



If you're looking for new powered near-field monitors, check out JBL's 6208 biamplified reference monitor. It incorporates an 8-inch high excursion woofer and a 1-inch titanium dome tweeter. Each transducer is driven independently by its own dedicated power amp. An internal active crossover is also included. Inputs can be balanced or unbalanced, +4 or –10 nominal levels, and XLR or 1/4-inch connectors. The transducers in the 6208 are aligned for simultaneous arrival of both high and low frequencies. Retail price is $499/each. To hear more, contact JBL Professional, 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-894-8850. Circle EQ free lit. #103.

SUPER MODEL

Roland brings digital sound design and digital sound restructuring to new heights with the introduction of the VG-8 V-Guitar System. Roland takes advantage of the tactile interaction between guitar and guitarist by utilizing a new technology called Composite Object Sound Modeling (COSM). Using COSM, the VG-8 can function in two modes: Variable Guitar Modeling (VGM) and Harmonic Restructure Modeling (HRM). In VGM mode, the VG-8 utilizes models of different pickup types and configurations, amp types, speaker configurations, mic types and placements, and guitar body types. In HRM mode, the VG-8 restructures the harmonic content in real time of the actual guitar waveform. The VG-8 can be controlled by any guitar using a Roland GK-2A Divided Pickup, which interprets each string individually. This provides digital signal processing capabilities per string such as panning each string individually anywhere in the stereo field, or pitch shifting on any or all of the strings. For more information, contact Roland Corporation U.S., 7200 Dominion Circle, Los Angeles, CA 90040. Tel: 213-685-5141. Circle EQ free lit. #104.

World Radio History

BEFORE SONUS

The PreSonus DCP-8 is a new 8-channel audio dynamics processor that is out on the market. The unit is housed in a one-rack-space chassis, and features eight discrete compressor/limiters, eight noise gates, eight independent mutes, and eight automated level channels — all under digital control. Using internal storage, all settings can be instantly recalled for up to 100 audio scenes. The DCP-8 also has a full-featured MIDI interface for access to all parameters and programming of automated mutes and level changes. Software features include up to four linked stereo channels, master/slave linking for grouping of channels, software switching of input levels (per channel), and easy-to-use automation features via the MIDI interface. For further details, contact PreSonus, Inc., P.O. Box 84008, Baton Rouge, LA 70884. Tel: 504-767-7887. Circle EQ free lit. #105.

IT'S ALL IN YOUR HEAD

All in your headphones, that is. And if you are in need of a new pair, consider checking out Sennheiser's HD265 headphones. Sennheiser's new headphones incorporate a two-layer diaphragm technology named "Duofol," which comes in to the rescue in fighting surface-born distortion resonances. Controlling the motion of the HD265's diaphragm are Neodymium-ferrous magnets. The HD265 is also fully modular, allowing the owner to replace parts and ensuring a long-lasting value. Complementing the Duofol diaphragm and Neodymium driver magnets are triple-wound aluminum voice coils. The earcups in the HD265 headphones are sealed all around for maximum isolation from outside noise. To hear more, contact Sennheiser Electronic Corp., 6 Vista Drive., P.O. Box 9487, Old Lyme, CT 06371. Tel: 203-434-9190. Circle EQ free lit. #106.

AUDITION AN AUDIX

Home and mobile studios now have another option for studio monitors to choose from. The Audix Studio 1A two-way monitors are comprised of die-cast woofers (6-1/2 inches), woven-cloth tweeters (1 inch), and a reinforced enclosure. The woofer's frame is constructed of a composite material that prevents metallic interference with the woofer's own magnet, and the cabinet is constructed of wood designed to absorb vibration. Specs for the 1A monitors are: freq. resp., 50 Hz - 18 kHz; power capacity (min–max), 50–250 watts; nominal impedance, 8 ohms; dimensions (inches H x W x D), 13 x 9x 10. For details, contact Audix Corp., P.O. Box 248, Lake Forest, CA 92630. Tel: 800-966-8261. Circle EQ free lit. #107.

SPIKED PUNCH

Designed to enhance the bass content in recording, as well as in live sound, Furman offers the new Punch-10 Bass Enhancement System. The Punch-10 synthesizes bass where none existed before by generating a bass octave below the existing fundamental. The Punch-10 can be used with or without a subwoofer system. A Low Frequency Assign button routes the bass content either to the subwoofer output only, or to both the subwoofer output plus the main (stereo) outputs. If no subwoofer is present, the latter position allows the enhanced bass to be heard through the available speakers. The subwoofer output contains frequencies of 85 Hz and below, while higher frequencies are rolled off at 18 dB per octave. The bandwidth, which appears at the main outputs, is set with the main speakers high pass control and is adjustable from 15 to 135 Hz. The Punch-10 includes a hard limiter with a threshold adjustable from –20 to +20 dBu. Retail price is $299. For more details, contact Furman Sound, Inc., 30 Rich St., Greenbrae, CA 94904. Tel: 415-927-1225. Circle EQ free lit. #108.

World Radio History

EQ PRODUCT VIEWS

TRANSLATE YOUR D8

If you're a multiformat user, the Spectral Translator might be just the piece of gear that you're looking for. The Translator is a rack-mount format conversion box that provides direct digital translation and communication of eight channels of audio among the following formats: ODI (Alesis ADAT, Fostex RD-8), TDIF-1 (TASCAM DA-88), Y2 (Yamaha DMC1000, DMR8, and DRU8), and SMDAI (Spectral AudioEngine and Prisma products). The Translator allows 8-channel direct digital transfers between any manufacturer's ADAT format machine and the TASCAM DA-88, as well as between those machines and Yamaha's digital mixers or recorders. All of those products can use the Translator to "talk" directly to a Spectral Prisma or AudioEngine eight channels at a time. Retail price is $995. For details, contact Spectral, 18800 142 Ave. NE, Woodinville, WA 98072.

STUFFED TO THE GILTRONICS

The retro comeback of the year has got to be the resurgence of tubes. Giltronics is jumping on the "warmth wagon" with its Model 356 vacuum tube mic preamp/line amplifier. The 356 has two channels, and offers continuous variable gain structures of 20 dB, 25 dB, 40 dB, 45 dB, 60 dB, and 65 dB from either of the two channels. Each channel combines a three-stage 45 dB mic preamp and a separate three stage 20 dB line amp. There are separate output level controls for both mic preamps and both line amps in both channels. Frequency response is ±2 dB from 18 Hz–20 kHz. For each channel, a front-panel switch chooses between separate mic preamp and line amp operations, or an interval five stage linkage providing a total of 65 dB of overall gain. Other features include phantom power availability on both channels, an input sensitivity switch, optional phase inversion, and 20 dB of input padding. All inputs/outputs are transformer-coupled balanced lines that use Reichenbach transformers, and signal processing can be used between mic preamp and line amp for either channel. For more details, contact Giltronics, Inc., #220 Nalomeli, Kapaa, HI 96746. Tel: 800-682-2778. Circle EQ free lit. #110.

D8 MATERIAL

To meet the worldwide multitrack digital audio market demand for superior-quality tape, Ampex Media Corporation introduced Ampex 488 Hi8 cassettes. They are designed for use with D8 digital multitrack recorders. The Ampex 488 Hi8 tape features a dual-layered tape formulation (a metal particle layer in the front-coat) and durable shell construction (low friction and low vibration for smooth transport), and is available in both 60-minute, and 113-minute audio program playtime lengths. For details, contact Ampex Recording Media Corporation, 401 Broadway, M.S. 3A-01, Redwood City, CA 94063-3199. Tel: 415-367-3888. Circle EQ free lit. #111.

THE ART OF PROCESSING

ART has released two new 8-channel dynamics processors, the MDM-8L limiter and the Eight Gate. The MDM-8L limiter provides individual control over each channel's input and output, individual channel bypass, channel linking, DAT switch to globally set all channels to the optimum performance level needed for digital multitrack recording, balanced inputs/outputs, and is housed in a 1U rack space chassis. The Eight Gate is a 1U rack space, digitally controlled, full-feature analog noise gate. Users have complete control over each channel's high-pass/low-pass Key Filter, threshold, attack, and release, and range parameters are accessible from the front panel of the unit. Each channel's settings on the Eight Gate are retained in memory and may be downloaded or imported via MIDI. Other features include channel linking, balanced inputs/outputs, and full visual display of parameters and functions. For more information, contact Applied Research and Technology, 215 Tremont St., Rochester, NY 14608. Tel: 716-436-2720. Circle EQ free lit. #112.

World Radio History

$399.99*

Spectrum™ Organ contains 128 presets including classic rock, jazz, gospel and pipe organ sounds. Each preset includes individual vibrato, distortion, reverb,key click and release click settings. These settings can be globally altered from the front panel, or using MIDI controller messages. In addition, each preset contains four drawbar waves which can be accessed in real time using the PC™-1600 MIDI Controller.

- *1 Mb 16-bit Classic Organ Sample Wavetable*
- *128 Presets*
- *32 Oscillators*
- *32 Voice Polyphonic*
- *4 Part Multi-timbral*
- *Voice Pedal Input*
- *Leslie Speed Pedal Input*
- *Stereo Audio Outputs*

$399.99*

Spectrum™ Synth contains 256 (64RAM/192ROM) classic synthesizer presets including analog, digital and hybrid sounds. With 24 dynamic resonant filters, hard sync and pulse width modulation, the Spectrum Synth emulates classic analog synthesizers better than any other digital instrument. Presets can be edited and saved to RAM locations using the PC-1600 MIDI Controller.

- *2 Mb 16-bit Classic Synthesizer Sample Wavetable*
- *256 Presets (64 RAM /192 ROM)*
- *24 Oscillators*
- *12 Voice Polyphonic*
- *12 Dynamic Resonant Filters and 24 LFO's*
- *Poly and Legato Receive Modes*
- *Hard Sync and Pulse Width Modulation*
- *Stereo Audio Outputs*

$299.99*

Spectrum™ Bass contains 200 presets including classic analog and digital synthesized basses, as well as electric, acoustic, fretless and slapped sounds. The Spectrum Bass includes sustained and legato versions of most presets sounds. Up to 4 presets can be layered on separate MIDI channels to create incredibly fat combination sounds. Individual presets can be edited using the PC-1600 MIDI controller

- *1 Mb 16-bit Classic Bass Sample Wavetable*
- *200 Presets*
- *8 Oscillators*
- *8 Voice Polyphonic*
- *8 Dynamic Resonant Filters and LFO's*
- *4 Part Multi-timbral*
- *Poly and Legato Receive Modes*
- *Stereo Audio Outputs*

$449.99*

Spectrum™ Analog Filter is a true programmable analog filter system which can be used to process any sound. It offers a 3-channel input mixer followed by a classic voltage controlled resonant 4-pole filter and voltage controlled amplifier. The filter circuit includes an ADSR envelope, velocity and key track amounts, and is MIDI controllable. The amplifier circuit also offers an ADSR envelope and master volume. 100 program locations allow settings to be stored in memory.

- *Classic Analog 4-Pole Filter Circuit*
- *100 Programmable Locations*
- *3 Audio Inputs*
- *MIDI Note Triggering*
- *Audio Trigger and Envelope Follower*
- *Filter Frequency Velocity and Key Tracking*
- *MIDI Controllable*
- *Mono Audio Output*

$349.99*

PC™ 1600 MIDI Controller This general purpose MIDI controller offers 16 sliders and 16 buttons that can be programmed to send system common or system exclusive MIDI messages. In addition, 2 CV pedals and the data wheel can be used as alternate controllers. The PC-1600 has many uses including programming and controlling any of the Spectrum series sound modules. The PC-1600 comes with 50 presets offering a variety of synth editors, sequence controllers, lighting system controllers, etc. All presets are fully programmable, so as other needs develop, they can be programmed by the user very easily.

- *16 Programmable 60mm Sliders*
- *16 Programmable Buttons*
- *2 Programmable CV Pedal Inputs*
- *Multi-function Data Wheel*
- *50 Programmable Memory Locations*
- *100 "Scene" Memory Locations*
- *Setup String Send on Patch Recall*
- *MIDI Dump/Load Capability*

GET WHAT YOU NEED. . . AND WANT. . . AT AN AFFORDABLE PRICE!

In a world of keyboards and sound modules which claim to offer "every instrument sound known to man," Peavey realizes that you probably don't want, or need, all of that! **The Peavey Spectrum Series** sound modules are each designed to do one thing--offer specific instrument sounds you do want. The Spectrum **Organ, Synth, and Bass** units offer unique features and capabilities needed to produce the most realistic reproduction of its particular instrument family.

Complementing the Peavey Spectrum Series sound modules are the **Spectrum Analog Filter** and the **PC-1600 MIDI controller**--offered to make the Spectrum Series modules even more powerful. The Spectrum Analog Filter will add that fat, classic and true analog sound to whatever you plug into it. And the Peavey PC-1600 MIDI controller allows programming and controlling of any Spectrum module.

Amazing sounds, amazing simplicity, amazing flexibility, and truly amazing prices! The only thing about the Spectrum Series that is not amazing is it's from Peavey...the company dedicated to giving musicians everything they need...and want!

U.S. Suggested Retail Prices

For complete Peavey keyboard information, pick up the latest edition of *KEY ISSUES* at your local Peavey dealer.

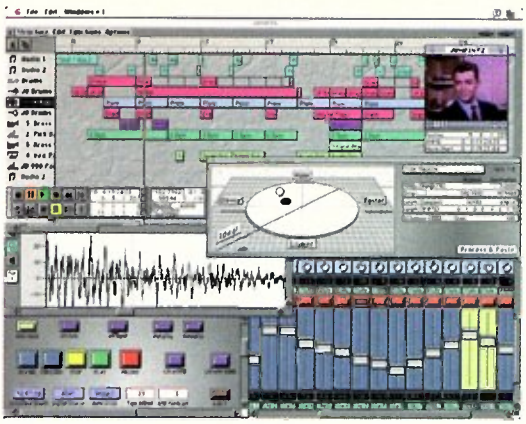
Peavey Electronics Corporation • 711A Street • Meridian, MS 39301 • Phone: (601)483-5365 • Fax: 486-1278

PEAVEY®

CIRCLE 48 ON FREE INFO CARD

World Radio History

EQ STUDIO WARE

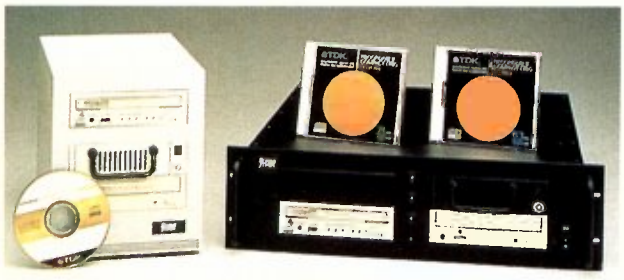


PRESTO!

Users get their money's worth with EMAGIC's new LOGIC EXTENSION series for LOGIC AUDIO Macintosh. The LOGIC EXTENSION series is comprised of Logic Audio CBX, Logic Audio AV, and Logic Audio TDM. With these new extensions users can incorporate new digital hardware into their LOGIC system as needed by their specific hardware set-up, without increasing the core price of LOGIC AUDIO. You don't have to pay for a feature set that doesn't work with your hardware configuration. For more details, contact EMAGIC, Inc., P.O. Box 750, Nevada City, CA 95959. Tel: 916-477-1051. Circle EQ free lit. #113.

HIP-HOP HOORAY

Have you ever wanted to use loops, but didn't want to go through all the red tape to get permission to use them? Or have you ever used a loop and found yourself in the middle of a lawsuit the next day? Voice Crystal Products is coming to the rescue with a sample CD called *Funky Rhythms You Can't Live Without*. It's the follow-up sample CD to Crystal Products' *Definite Grooves*. The hip-hop loops, drum samples, loopable basses, etc., are all license free, so if your track utilizes the samples on this CD, and it goes platinum, you won't owe a dime to anyone (except to your manager). *Funky Rhythms You Can't Live Without* contains 72 minutes of material, and retails for $99.95. For more details, contact Eye & I Productions, 930 Jungfrau Court, Milpitas, CA 95035. Tel: 408-945-0139. Circle EQ free lit. #114.

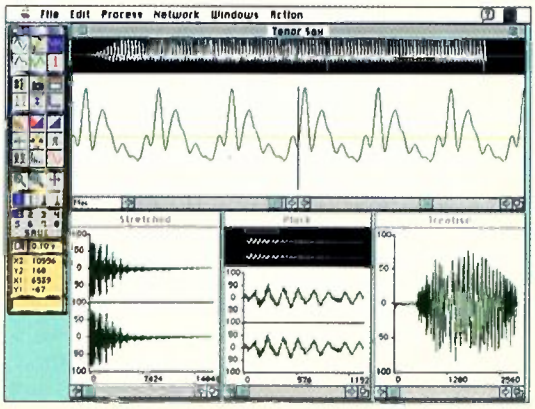


RORKE DEAL

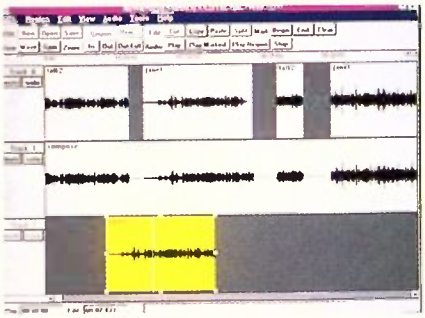
Rorke Data is offering both rackmount or desktop 4x or 2x CD-recordable subsystems for Masterlist, Windows, UNIX, or Macintosh. These disk drives come in a single 4RU, 19-inch rackmountable configuration with SCSI address access on the front. There is also a three-bay desktop enclosure available as well. Typical configurations include 4x CD-R, 4x CD-ROM, and 2 GB nonthermal-cal hard drive. CD-R Mastering software can be bundled for Mac, Windows, or UNIX. For info, contact Rorke Data, Inc., Technology Park II, 9700 West 76th St., Eden Prairie, MN 55344. Tel: 800-328-8147. Circle EQ free lit. #115.

PASSPORTS, PLEASE

Passport Designs' Alchemy returns with version 3.0. It's a 16-bit stereo sample editor that allows users to take existing sounds and manipulate them as desired to create music and analyze sound properties. Feature such as Unified Sampling Technology and Distributed Audio Networks were designed to meet the demands of a market that is more involved than ever in utilizing sampling and sound design as key means of music production. With Multitap digital delay, effects can be stored, named, and applied to multiple samples. The Distributed Audio Network shares sampled sounds among different samplers, while Open MIDI System (OMS) support has been added to offer flexibility in using other sequencers and editing tools. Alchemy 3.0 supports 8-bit and 16-bit .WAV files. For more information, contact Passport, 100 Stone Pine Rd., Half Moon Bay, CA 94019. Tel: 415-726-0280. Circle EQ free lit. #116.



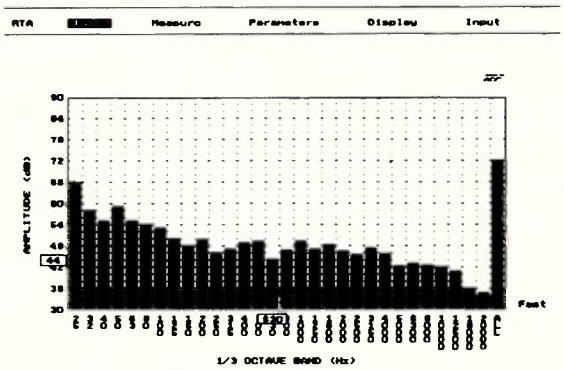
World Radio History



NU FROM ANTEX

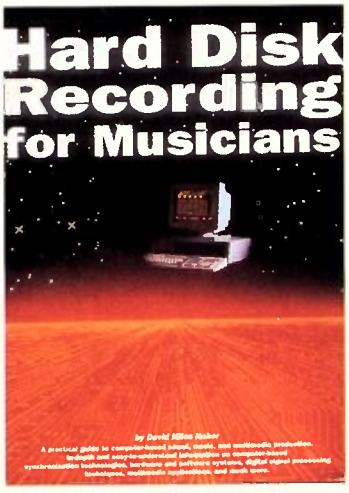
A new wave of digital editor has hit the market, and it is specifically designed to edit compressed audio files created by Antex digital audio adapters and other compatible adapters. The Antex NuWave editor supports multiple .WAV compression formats, including Dolby AC-2, MPEG Layer I/II, and MS-ADPCM, as well as standard 8- and 16-bit PCM. Compressed files maximize audio and video quality at limited bandwidth because they demand less from a computer's CPU and take up less disk space than noncompressed files. Antex's NuWave can handle multiple compression formats within a single edit decision list (EDL). Though the editor was designed for use with Antex and compatible adapters, NuWave will run with any Windows-supported sound card. NuWave includes nondestructive editing. Two stereo/four mono tracks are compatible with NuWave, and each track may contain an unlimited amount of audio regions each with real-time, fade in/out for crossfading between tracks. Retail price is $595. For information, contact Antex Electronics Corporation, 16100 South Figueroa St., Gardena, CA 90248. Tel: 310-532-3092. Circle EQ free lit. #117.

TEF ENOUGH



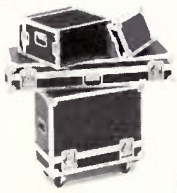
Designed to provide users with the ability to perform real time analysis, TEF Products has just expanded their TEF 20 analyzers with the new Sound Lab RTA version 2.0 software. With Sound Lab RTA, measurements can be made at 1, 1/2, 1/3, 1/6, and even 1/12 octave bands, while data can be viewed in 3, 6, or 12 dB per division increments. Sampling bandwidths of 24, 12, 8, or 6 kHz allow users to choose a desired frequency range as low as 25 Hz in 1/12 octave measurements and 6 Hz in 1/3 octave measurements. Exponential, accumulated, and stable modes can also be selected for real-time averaging. Data can be viewed with A, B, or C weighting, or with flat setting. Sound Lab RTA's dual-channel mode provides the ability to differentiate two input signals, which means that even a program source can be used as a test signal. Sound Lab RTA is compatible with IBM PC computers and meets all ANSI-band requirements for an extended 1/3-octave and one-octave real-time analyzer. Retail price is $400. For information, contact TEF Products, Crown Int'l, P.O. Box 1000, Elkhhart, IN 46515, Tel: 219-294-8295. Circle EQ free lit. #118.

HIT THE BOOK



EQ contributor David Miles Huber's new book, *Hard Disk Recording for Musicians*, is a guide to computer-based sound, music, and multimedia production. It is abundant in diagrams and easy-to-read definitions, making this book a helpful tool for musicians, students, engineers, and anyone involved in the recording industry. Some of the topics included are hardware, digital audio transmission, hard disk editing, digital signal processing, and multimedia production. Retail price is $24.95. For more details, contact Music Sales Corp, 257 Park Ave., South, New York, NY 10010. Tel: 212-254-2100. Circle EQ free lit. #119.

PROFESSIONAL QUALITY AT THE RIGHT PRICE

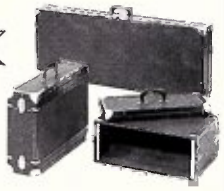


Heavy Duty ATA
- Custom and stock sizes
- Quick turn around

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 29 ON FREE INFO CARD

LEIGH'S computers

144 W. Eagle Rd
Havertown. Pa. 19083
(USA) 800-321-6434 (CAN)
(610-896-2424) FAX- 610-896-4414
Internet : leighs@ix.netcom.com
Compuserve: 75213,3615

SAW
Software Audio Workshop

With Saw you can easily:
Overlay vocals over music, add in sound effects, master & assemble albums.

We are low cost hard disk recording experts!

Recommended hard disk recording cards:

DigitalAUDIO The CardD +
DIGITAL ONLY CARD (SPDIF)

SOUND FORGE 3.0
Stereo mastering software w/ 10 band EQ, digital effects, chorus, reverb, distortion, flange ETC- Time compression & expansion, sample editing via SCSI or Midi SDS, Almost every sound file format supported! Make CD's!

Turtle Beach Tahiti or Monterey.

Call for FREE Midi Multimedia catalog .

We ship worldwide !!
FAX 610-896-4414

CIRCLE 46 ON FREE INFO CARD

World Radio History

STARVED FOR LINE INPUTS? FEAST ON TH

Introducing the ultimate line/keyboard mixer with more inputs than nature ever intended. The new LM-3204 has 16 stereo channels and up to 40 mono inputs. In just 5 rack spaces. Serious input gluttons can add LM-3204E expander units for 80, 120 or even 160 inputs!

The LM-3204 wasn't cooked up by a marketing department. It was designed by keyboard and sequencing nuts who never have enough inputs. It's the line mixer we've always wanted in our own studios.

We cherry-picked the best features from our proven CR-1604 and then blended in new recording and monitoring capabilities. And, even though this is a "line" mixer, we garnished the LM-3204 with two of our highly-respected mic preamps for sampling, voice-overs and single/duo club acts. Yum.

This typically wordy Mackie ad is just a taste of the LM-3204's mega menu of features.

Call tollfree and then digest our brand new 40-page product brochure and Hook-Up Guide. It covers the LM-3204 in delicous detail.

More than just 40 inputs in 5 rack spaces.

Lots of companies make line mixers[1]. But only our new LM-3204 was built to handle hordes of hot inputs and still have lots of headroom.

The headroom bottleneck in any mixer is the mix amp where signals from all channels are combined. If this circuit overloads, the sound breaks up. (And bringing down the master gain control doesn't help a bit). Product specs can't express a mixer's ability to handle multiple simultaneous inputs. So you find out that you bought a line mixer with poor mix amp headroom only *after* you get it home.

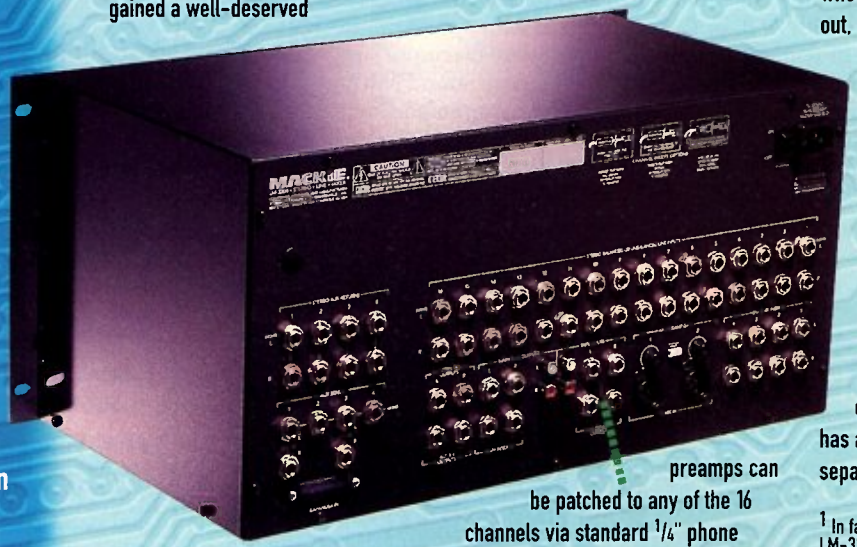
Unless you buy an LM-3204. Its unique mix amp architecture lets you cram sixteen sadistically sizzling stereo inputs into the LM-3204 without getting scratchy garbage at the outputs. Need proof? Consider our CR-1604, MS1202 and 8•Bus consoles. Naturally, the LM-3204 has the same headroom pedigree.

Two mic preamps.

Mackie's mic preamp design has gained a well-deserved reputation among seasoned recording engineers — several even use a CR-1604 or MS1202's preamps instead of those on their ultra-expensive main console[2]. So we added two mic preamps (with phantom power and input trim controls) to the LM-3204. Both preamps can be patched to any of the 16 channels via standard 1/4" phone cords. Perfect for project studio sampling, live sounds orsmall lounge acts.

Sealed rotary controls *resist dust, moisture & other contamination.*

4 AUX sends *(2 stereo/2 mono) per channel accessed from 2 knobs.*



Signal present LEDs on every channel.

To some, –20dB "blinkies" may seem like a minor feature. To those who work with a mixer day in and day out, it's major cause for celebration.

The LM-3204 features the same "expressive" sensing design that we developed for our 8•Bus console's signal present LEDs. One famous engineer says he can practically run his board based on the behavior of our ultra-responsive LED blinkies.

Monitoring made easy.

By popular request (and our own experience), the LM-3204 has a Tape Monitor switch plus separate Control Room and Phone

[1] In fact, we were so late in shipping the LM-3204 (what else is new?) that one of our competitors came out with *their* version before we could release the original!

[2] Actually, we can go one better than that. What does Neumann use at trade shows to demo their finest microphones? A Mackie compact mixer with the same mic preamps as the LM-3204.

World Radio History

ON THE LM-3204.

/2 mono) per
om 2 knobs.

3-band EQ. 80Hz, 2.5k and 12khz just like our famous CR-1604.

2 new Secret Buttons add mixing & monitoring flexibility (see below).

nt LEDs
annel.
linkies" may
ure. To those
day in and day
r celebration.
tures the same
nsing design
ed for our
signal present
s engineer says
y run his board
avior of our
LED blinkies.

made easy.
quest (and our
the LM-3204
itch plus
and Phone

shipping the
?) that one of our
eir version before
al!

etter than that.
trade shows to
nes? A Mackie
ne mic preamps as

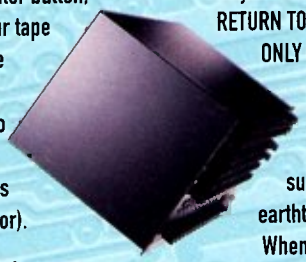
monitoring outputs with their own level controls. For added convenience, we made the Control Room volume adjustment a 45mm fader instead of a rotary knob.

Both Phones and Control Room monitor the main left and right buses. If you press the Tape Monitor button, you hear the output of your tape recorder[3] (or other source plugged into the Tape In jacks). Or monitor the solo bus when any channel's Solo switch is pushed (this also overrides Tape Monitor).

LM-3204 Aux Return Bonus Switches.

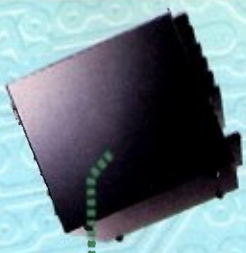
Naturally the LM-3204 has our trademark ALT 3/4 extra stereo bus. It also has a special aux return circuit that lets you get even more mileage out of ALT 3/4. Normally, AUX Return 3 is just that: an aux return. But press the SOURCE ALT 3/4 button and the outputs of the ALT 3/4 bus are routed into the Aux Return 3 control and circuitry. This lets you use ALT 3/4 as a pair of submix buses...and then mix 'em back into the main L/R buses.

AUX 4 also has it own trick circuit. If we tell you that it's called the AUX RETURN TO CONTROL ROOM ONLY switch, can you guess what it does? Correct! You win a year's supply of designer earthtone patch cords.



When AUX RETURN TO CONTROL ROOM ONLY is engaged, AUX Return 4 is disconnected from the main left and right buses. It's reconnected to the Control Room Monitor and Headphone circuits. Now you can "wet monitor"[4] or play along to a cue or click feed without having it go onto tape.

[3] Speaking of taping, the LM-3204 has electronically-balanced main outputs capable of driving either –10dBV or +4dBu recorders. 1/4" TS Tape In jacks and unbalanced "RCA"-type Tape In and Tape Out sockets.



Instantly expandable.

When 16 stereo channels aren't enough, add an LM-3204E *Expander*. It's basically an LM-3204 without the master section. It connects in seconds via ribbon cable to provide 40 more inputs. And you can daisy chain two or three LM-34204Es without headroom or noise penalties.

Already making a name for itself among the pros.

It hasn't been out for long, but the LM-3204 is already distinguishing itself by the company it keeps. All the members of *Boyz II Men* are currently using LM-3204s in their project studios. *Saturday Night Live* band drummer Shawn Pelton submixes with one. Keyboard supertechs Terry Lawless (*Madonna, Paula Abdul*) and Russ Achzet (*Moody Blues, Chicago, Jimmy Buffet*) swear by their LM-3204s. Electronic percussion wizard Pat Mastellotto uses an LM-3204 on *King Crimson*'s world tour (he recently sent us a nice postcard from Paris). We could go on and on[5].

The affordable line input mixing solution.

The LM-3204 retails for $995[6]. You can add LM-3204Es for $899[6] each.

At this price, there's no excuse not to have enough line inputs. For effects or instrument submixes. As a project studio's mixer. Or for live club performance.

Call us today or visit your nearest Mackie Designs dealer.

[4] *Wet monitoring*: Monitoring with echo or delay but without actually applying the effect to the main left and right outputs.

[5] Indicates use and ownership by individuals but not specific endorsement by the group.

[6] Suggested retail price. Your mileage may vary as part of a balanced diet or when you close cover before striking. Price is higher in Canada.

CIRCLE 42 ON FREE INFO CARD

MACKIE.

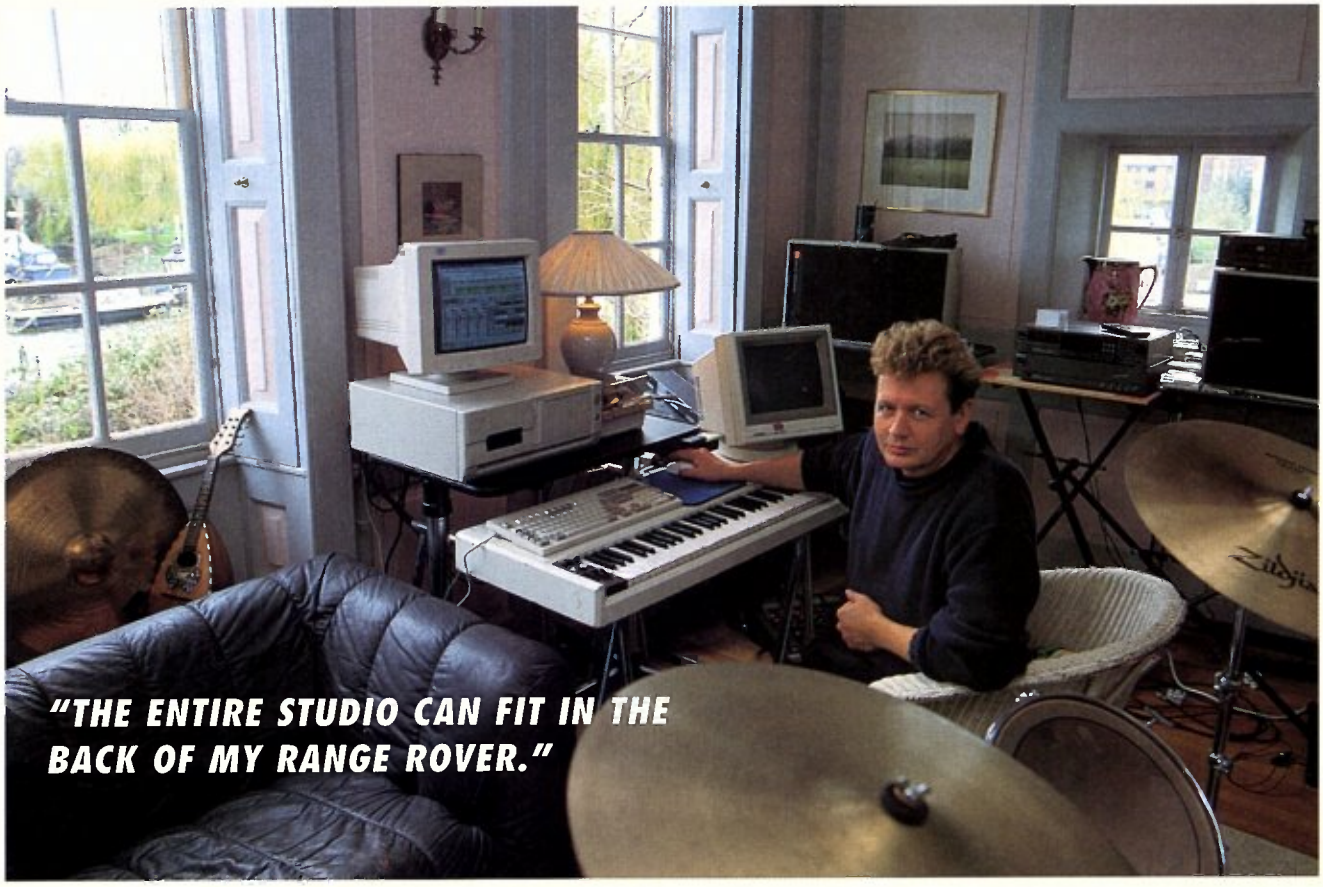
16220 Wood-Red Road • Woodinville • WA • 98072 800/898-3211 • 206/487-4337
Internet: mackie.com • Outside the US. 206/487-4333 • Represented in Canada by S.F. Marketing 800/363-8855

World Radio History

Talkin' Bout Re-re-re-remastering

Jon Astley uses project studio mastering techniques on The Who

LOCATION: Twickenham, London
KEY CREW: Jon Astley, owner and engineer
PROJECTS RECORDED: Currently remastering the entire The Who catalog and Eric Clapton's Rainbow Concert
CREDITS: "Something in the Air" by Thunderclap Newman was recorded in this room
CONSOLE: Soundcraft 200
KEYBOARDS: Fairlight; Yamaha DX7, Roland D550; Roland MKS70; all Proteus modules; Prophet VS; Yamaha C3 piano
SAMPLERS: Fairlight 3+
MONITORS: JBL 4311; Yamaha NS10M
AMPLIFIERS: HH300; Quad; Amcron
COMPUTERS & SOFTWARE: Notator (Atari and Mac versions); Fairlight; SADiE
RECORDERS: SADiE hard disk editor; 1/4-inch Ampex
DAT MACHINES: Sony PCM 2500; Technics Portable; Panasonic 3700
OUTBOARD GEAR: D/A Prism; Apogee Converters; Yamaha SPX1000; Digital Music Corp MX8
MICROPHONES: None!
STUDIO NOTES: Astley states: The studio looks over the Thames and used to be Pete Townshend's studio, where some great songs were born. The studio is used in three main areas: record preproduction/arranging/programming; songwriting/composing; and final stages premastering. Plus, the entire studio can fit in the back of my Range Rover.
EQUIPMENT NOTES: Astley continues: My favorite piece of equipment is my SADiE hard disk system. I now have six hours of recording time on it, that means I can be working on two or three different projects at the same time, leaving the finished project on disk well after mastering — until everybody is happy.
PRODUCTION NOTES: Astley states: Recently I was using the SADiE to record tracks (against timecode) from a digital copy-master of The Who's *Live at Leeds*. The original eight tracks had a lot of electrical clicks and bumps on it, so, copying two tracks at a time, the music was declicked with a CEDAR Audio DC1. I used the SADiE to advance the tracks 105 ms as they went back — this being the time the DC1 takes to process the signals. I sequenced and tweaked the tracks at home before remastering at Metropolis in London. The new *Live at Leeds* will contain a lot of material left off of the original due to the faults that modern techniques can overcome. Much the same applies to the remixed Eric Clapton's Rainbow concert, which we are putting the final touches to at the moment. **EQ**



"THE ENTIRE STUDIO CAN FIT IN THE BACK OF MY RANGE ROVER."

World Radio History

2:00 a.m. The band just found the sound they've been looking for. Everyone's rockin'. Except you. **You're figuring out how to tell them the HIGH OUTPUT master you were using just "crapped out."**

Of course, you wouldn't be having this anxiety attack if you used new **BASF 900 *maxima*** High Output Mastering Tape. With 3 dB more output and 2 dB less noise than standard analogue mastering tapes, it is identical to the MOL and the signal–to–noise ratios of other high output masters. But it has the reel–to–reel reliability and consistency of BASF 911. Low rub off. Precision–manufactured. It's classic BASF. The kind of BASF tape studios have been relying on since 1934. As you turn to face the band (gulp), you make a vow. If you survive the next ten minutes, the first thing you'll do is contact BASF, 1–800–225–4350 (Fax:1–800–446–BASF); Canada 1–800–661–8273.

DEMAND IT.

BASF

© 1994 BASF Corporation Information Systems

CIRCLE 10 ON FREE INFO CARD

World Radio History

Electro-Voice RE2000

This mic keeps its cool no matter how hot you run it

Photo by Ed Colver

NAME: Electro-Voice RE2000
PRICE: $2450, including power supply, shock mount, pop filter, stand clamp, and carrying case.
TYPE OF MIC: Externally biased condenser
POLAR PATTERN: Supercardioid
FREQUENCY RESPONSE: 70 –18,000 Hz
SENSITIVITY: 20 mV/pascal @ 1 kHz
RATED SOURCE IMPEDANCE: 150 ohms, transformer balanced
EQUIVALENT NOISE: 10 dB SPL, A weighted
MAXIMUM INPUT SPL: 148 dB (with 10 dB attenuator)
LOW-FREQUENCY ROLLOFF: 130 Hz, 12 dB/octave (switchable)
POWER REQUIREMENTS: 12-volt DC external regulated or 12–48-volt phantom supply
DIMENSIONS: 8.1" (H) x 2.5" (W) x 1.7" (D)
WEIGHT: Microphone: 11.3 ounces; shock mount: 14 ounces
MIC NOTES: The RE2000 is the first microphone to use Electro-Voice's Constant Environment System or "CES." The CES warms critical components of the microphone to a specific and constant temperature to prevent changes in the surrounding environment from adversely affecting the performance of the mic (this also ensures consistency of sound when recording overdubs over a period of weeks). By preventing moisture from forming between the diaphragm and backplate, CES also avoids the possibility of a short between the plates of the condenser.
USER TIPS: The RE2000 is an effective choice for recording vocals when you need an up-close and intimate sound without adding the proximity effect characteristic of other directional condenser mics. The mic can be positioned as close as 4 or 5 inches from the vocalist without building up the low-frequency content typical of most mics. The RE2000 can be operated via standard phantom power, but requires the EV power supply to enable the CES. EQ

World Radio History

K-RoK'N IN THE FREE WORLD

The new KRK K-RoK close-field monitor looks as if it's been carved out of solid granite. These bizarre-looking little monsters feature a unique box design that produces better linearity and low-end punch than any monitor in their class.

Featuring a powerful 7" long-stroke woofer, a 1" silk-composite dome tweeter and fanatical KRK engineering, the affordable K-RoKs ($449.00 per pair) deliver the smooth response and high power handling capability that have made KRK monitors legendary.

Perfect for the home studio, K-RoKs provide world-class performance without blowing your budget. Why settle for some cheaply-constructed mini-monitor when you can own an authentic KRK reference monitor for about the same dough? Contact your local KRK dealer for a K-RoK demonstration. K-RoK, fanatical by design.

KRK MONITORING SYSTEMS

Distributed by Group One
East Coast Office:
(516) 249-1399 • FAX (516) 753-1020
West Coast Office:
(310) 306-8823 • FAX (310) 577-8407

KRK Monitoring Systems
16462 Gothard St., Unit D
Huntington Beach, CA 92647
(714) 841-1600 • FAX (714) 375-6496

Photo by Ed Colver

CIRCLE 40 ON FREE INFO CARD

World Radio History

WHEN IT COMES TO RECORDIN
WILL PUT YOU IN A COMP

Balanced mic and unbalanced line inputs with phantom power and 20dB pad accommodate the widest range of input signals.

The only console in this price range with true Split EQ, each assignable to monitor or channel. High-frequency shelving control at 12 kHz, low frequency at 80 Hz for smoother, more musical EQ results.

Dual sweepable mids on each channel let you apply 16dB of boost or cut at critical frequencies.

Setting up two independent stereo cue mixes is no problem. Try this with other mixers in this price range, it just won't happen or you'll have to compromise something.

The most versatile AUX section in its class; rivaling expensive high-end consoles. 8 sends total, 2 in stereo. Send signal in stereo or mono, pre- or post-fader. Available all at once. Return signal through any of 6 stereo paths.

Direct channel input switching. Assign to one of eight busses, or direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching. You won't find this kind of speed or flexibility in a "one-size-fits-all" board.

Feel those 100mm faders! Turn those smooth and responsive knobs! They feel and work better than any other in its class. The M-2600's physical design takes the aggravation out of recording and lets you focus on the process of creating music. Everything is 'right where it ought to be'. Try it for yourself.

For your personal or project studio, don't settle for anything less than a dedicated recording console. Some may try to convince you that a "multi-purpose mixer" works fine for multitrack recording. But don't take their word for it. The compromises, hassles and workarounds just aren't worth it.

Want proof? Ask your salesman how a multipurpose mixer handles these common recording situations. But listen carefully for workarounds, repatching schemes and other compromises. Then compare it to how easily the M-2600, a *true* recording console, sets up and does things.

SITUATION Separate headphone mixes for the talent and the producer. The talent wants a reverb-wet mix, but the producer wants it dry. Everyone wants it in stereo.

Compromise: Multi-purpose mixers require you to sacrifice 4 AUX sends and tape returns to get 2 stereo headphone mixes; but you need those sends/returns for outboard effects! What a dilemma.

M-2600 Solution: With a few buttons, assign up to two, independent stereo AUXs to be used as headphone mixes. Everyone hears the mix they want — and you've still got four AUX sends and returns free for signal processing gear.

SITUATION You're EQing tape tracks to get just the right sound. You're using the shelving EQ for the monitor mix, and the sweepable mids for the channel buss. Still, the drummer wants a certain frequency out of his mix — a job for the sweepable mids.

Compromise: Few multi-purpose mixers have EQ assignment. You're stuck with the shelving EQ on the monitor mix, and the sweepable mids on the channels *(if they even have split EQ)*. You've got no choice. Good luck trying to explain this to the drummer.

Available with 16, 24 or 32 inputs, the M-2600 is optimized for digital recording. Don't wait till your first session to discover the compromises and hassles other boards will put you through.

M-2600 Solution: Assign the shelving EQ, the sweepable EQ, or both to either the monitor or channel buss as necessary. The entire EQ section is splittable and assignable and can work in tandem.

SITUATION Mixdown. You're sending tracks to effects units for added studio polish. You want to take advantage of true stereo effects. How do you do it?

Compromise: Most multi-purpose mixers have fewer AUX sends than the M-2600's eight. Usually only in mono. And, some sends are linked, so you can't send them to different signal paths. So you settle for only a few effects, or forego stereo effects altogether.

M-2600 Solution: Pick one: 8 mono sends or 1 stereo and 6 mono sends or 2 stereo and 4 mono sends. Each with its own level control and separate output jack. So you can use true stereo effects and still have sends left over for effects. Send the effects signals back via 6 stereo returns.

That's not all! The M-2600 doesn't compromise sound, either. You'll appreciate the new TASCAM sound — low-noise circuitry and Absolute Sound Transparency™. It all adds up to the perfect console for any personal or project studio — combining great sound with recording-specific features you'll need when recording, overdubbing and mixing down. Features you can get your hands on for as little as $2,999 *(suggested retail price for the 16-input model).*

So forget compromises. Invest in a true recording console. The TASCAM M-2600.

Each M-2600 channel features advanced-design mic pre-amps with incredibly low-distortion specs. Plus you get phantom power on each channel. Feed anything into the M-2600 from condenser microphones to line input from synths and sound modules.

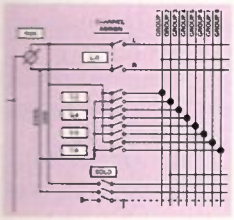
World Radio History

CORDING, MOST OTHER CONSOLES
A COMPROMISING SITUATION.

Only the M-2600 provides two independent stereo cue systems. Demanding performers can hear the submix or scratch tracks the way they want, so they'll perform better. Meanwhile, the control room or producer's mix is unaffected. You can accommodate everyone involved in the production — without interrupting the creative flow.

Best of all, using the cue mixes doesn't involve tying up your valuable AUX sends.

Use more effects/signal processing gear on more tracks with the M-2600. Use two (count 'em) true stereo send/returns to support stereo effects units. Plus, you still have 4 fully-assignable AUX sends left over for other gear. A total of 8 AUX sends — more than nearly any other console — anywhere. Better yet, you can use them all at once. No compromises. At mixdown, you can actually double your inputs so you can mix in all those virtual tracks. Just press the "Flip" switch. No repatching. No need to buy expensive and space-eating expansion modules.*



The incredibly flexible design of the M-2600 means signal routing is versatile and accomplished by the touch of a button, instead of a tangle of wire. Our decades of mixer experience has resulted in an ergonomic design that's exactly what you need: a board that speeds and facilitates recording and mixdown. Everything is where you intuitively think it should be. Dedicated solo and mute indicator lights on every channel, on master AUX sends, stereo returns, and each of the 8 busses so you always know exactly what you're monitoring. Plus, SmartSwitches™ protect you against redundant or canceling operations.

ABSOLUTE SOUND AST TRANSPARENCY

TASCAM M-2600: THE CONSOLE DESIGNED SPECIFICALLY FOR RECORDING.

Of course, the M-2600 sounds great. It's got totally redesigned low-noise circuitry, Absolute Sound Transparency™ and tremendous headroom. No coloration and virtually no noise. You will hear the difference. So, even during long mixdown marathons, you'll hear an accurate representation of what's been recorded.

TASCAM®

Take advantage of our experience.

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

CIRCLE 68 ON FREE INFO CARD

World Radio History

Akai DR8 Hard Disk Recorder

Take a look at Akai's 8-track sequel to its popular DR4d hard-disk recorder

When Akai introduced its DR4d hard disk recorder, they took random-access multitrack recording technology and put it into a package that was as easy for musicians to deal with as any multitrack tape machine. By providing the DR4d with familiar transport controls, intelligent interface options, and the ability to link units together (for up to 16 tracks), Akai planted its foot firmly into the digital arena. Now Akai has taken the next logical step into digital hard-disk recording with the DR8.

The Akai DR8 hard-disk recorder (HDR) is capable of recording eight tracks simultaneously to either internal hard drive or external SCSI-compatible drives. Two internal SCSI drives can be accommodated and the DR8 can address a total of seven SCSI drives. The DR8 can record 16-bit data at sampling rates of 48 kHz, 44.1 kHz, 44.056 kHz, or 32 kHz. The DR8HD ($4995) comes factory-fitted with an internal 1 GB hard drive that can store approximately 3 hours and 20 minutes of audio. In practical terms, this allows 25 minutes on each of eight tracks with 16-bit resolution and a sample rate of 44.1 kHz. Lowering the sample rate to 32 kHz will give the user more recording time, but will limit the high-frequency response to around 15 kHz. Studio owners who like the idea of being able to lock up multiple machines take note: up to seven DR8's can be locked together without a synchronizer, increasing the number of available tracks to 56. The front panel of the DR8 has the standard complement of transport controls (and more), making many of its functions immediately apparent to anyone using the unit for the first time.

The rear panel of the DR8 has quite a complement of connectors, including 1/4-inch TRS connectors for unbalanced or balanced inputs (which can be used as external inputs when mixdown time comes) and outputs for each of the 8 tracks. These are switchable in pairs for –10 dB or +4 dB operation. Also appearing on the rear panel are a pair of balanced/unbalanced analog master L/R outs, two auxiliary send outputs (configurable as either two mono sends or one stereo send), and a series of AES/EBU and S/PDIF digital I/Os. A SCSI connector allows access to external hard drives, and there are slots for optional interfaces including SMPTE and MIDI interface boards.

Like most hard-disk recorders, one of the DR8's strengths is in the fact that it allows you to randomly access any part of a recording. If you have never done a session on a HDR, you will be amazed at how much time can be wasted locating audio on a piece of tape. Since the DR8 is tapeless, rewinding and fast-forwarding to a specific point on the tape is simply a matter of hitting Locate. Akai makes this even easier by giving the DR8 nine "Direct" and 100 "Stack" locate points. The DR8 also has auto punch in/out functions and any of these locate points can be precisely determined by using the unit's jog wheel. Like most disk-based recorders, the DR8 is capable of cut/copy/insert editing and has one level of undo in case you just accidentally deleted that amazing guitar solo. The DR8 lets you

continued on page 117

E-MU SYSTEMS "BUCKEYE" HARD DISK RECORDER

The availability of affordable hard disk recorders is increasing and E-mu is tossing their hat into the ring with the Buckeye. This unit is a stand-alone, 8-track digital hard disk recorder, expected to retail in the US for a base price between $3000 and $4000. Buckeye requires no external computer or software for operation and is available with an optional internal 1 GB drive. Because the recorder is SCSI-compatible, an external hard drive can also be used for storage of digital audio data. Other features included in Buckeye are tape machine-style transport controls, a jog wheel, S/PDIF I/Os, and a large graphic user interface. This new unit from E-mu was announced at the 1995 Frankfurt International Musik Messe, and *EQ* will present more information as it becomes available.

World Radio History

REASONS TO CHOOSE THE MACKIE 8•BUS-PT 1

Lately, several big pro audio companies have gone out of their way to "mention" us in their own 8-bus console ads. Many satisfied Mackie owners have urged us to shoot back with hardball comparisons of our own. But that's not our style.

Greg believes that if a product is really good, it should speak for itself — without resorting to slagging the competition. First in a series, this ad details some of the features that we believe make our 8•Bus the best recording or PA console values available today for under $20,000.

Apparently we're not alone in our belief. In competition with several of the very consoles that keep "mentioning" us in their ads, we recently won a coveted *MIX* magazine TEC Award for Small-Format Consoles. As well as *LIVE! Sound* magazine's Best Small Club Front of House Mixer Award. Both awards were the result of pro audio industry balloting by folks like you. Not negative advertising.

Learn more about the 8•Bus Console. Call us toll-free for our detailed, 24-page 8•Bus brochure.

A Comprehensive equalization for creativity and problem-solving.

To quote Electronic Musician magazine[1], *"It's no secret that the versatility and pristine sonics of the 8•Bus EQ have astonished jaded pros and home hobbyists alike. The 4-band EQ section includes two shelving controls fixed at 12kHz and 80Hz; parametric high-midrange EQ with a 500Hz to 18kHz sweep and a bandwidth that can be adjusted between three octaves and one semitone; and low midrange EQ with a 45Hz to 3kHz sweep. A full 15 dB of boost or cut is provided for each band. In addition, an 18 db/octave low-cut filter is set at 75 Hz. That's a heck of a lot of firepower!"*

No kidding. But we also like that part about pristine sonics. One of the reasons that the 8•Bus Series took so long to ship was that Greg was determined not to compromise EQ sound quality.

The biggest gun in the 8•Bus' EQ arsenal is its true parametric high midrange EQ. Conventional sweepable midrange has a fixed bandwidth of about 2 octaves. No matter how high or low in frequency you sweep it (or how much you boost or cut it), 2-octave EQ's *contour* stays the same. Sort of like being asked to paint a picture with only a bucket of bright yellow paint.

By letting you vary the bandwidth, the 8•Bus' parametric EQ gives you the equivalent of a full rainbow of tonal "colors" in your artistic pallet. Spreading midrange EQ over three full octaves transforms it into an extremely subtle — yet extremely dramatic effect. Sweet and natural-sounding, it can unobtrusively change the character of a track without noticeable tonal intrusion. And, for those times when you want what can only be called surgical EQ, our hi mid can be dialed to as narrow as 1/12-octave — four times as precise as a 1/3rd-octave graphic equalizer! It's like having a delicate artist's brush for erasing or enhancing tiny details. Between three octaves and 1/12-octave is a vast range of tonal colorations, nearly all possible only with parametric equalization. And, since our "HI" mid's sweep range extends from 18kHz all the way down to 500Hz, your creative palate extends over six octaves – to our knowledge the widest midrange sweep currently available in a comparably priced console.

[1] September 1994 issue, page 64, in a sidebar to an article on The British Invasion (of consoles). We urge you to read the whole thing so that we don't get in trouble for quoting stuff out of context.

B VLZ Circuitry for very low noise.

Why ship 8•Bus consoles with monster 220-Watt Power Supplies? Partially because we love to over-engineer things for added performance. But also to better enable Very Low Impedance (VLZ) circuitry in critical places like our mic preamps.

At room temperature, all electronic components create thermal noise that can cumulatively become audible and objectionable. We design around thermal noise by making internal circuit impedances as low as possible everywhere possible. For example, resistor values in our mix bus are 1/4 the value of those typically used — hence thermal noise is proportionally lower. Another VLZ advantage is that low-impedance circuitry is more immune to crosstalk problems.

Achieving VLZ requires thoroughly buffered circuitry and creates high current consumption. That's one more reason that the 8•Bus console comes with a massive, 31-pound, power supply.

24•E Expander 32•8 Console

MACKIE.

16620 Wood-Red Rd. (new digs!) • Woodinville • WA • 98072 • 800/898-3211 • FAX 206/487-4337
Internet: mackie.com • Outside the US, call 206/487-4333 • Represented in Canada by S.F. Mktg. • 800/363-8855

CIRCLE 85 ON FREE INFO CARD

World Radio History

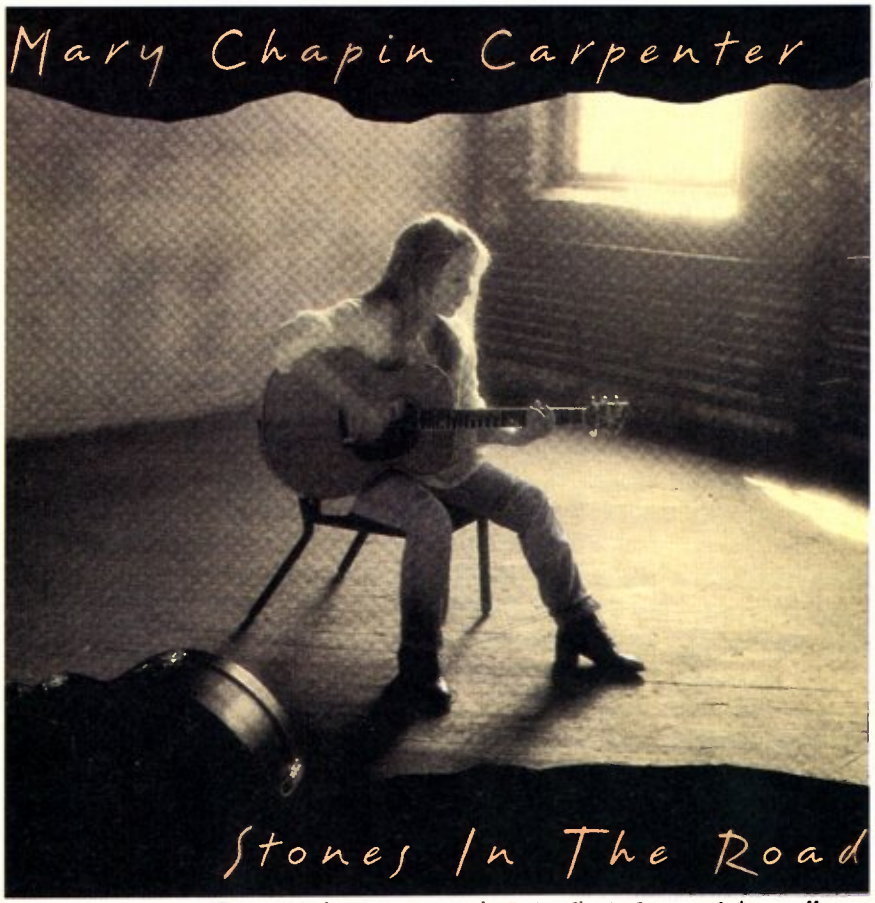
"Shut Up And Kiss Me"

Engineer Bob Dawson talks about recording Mary Chapin Carpenter's latest hit

BY STEVE LA CERRA

EQ: How did you record the rhythm tracks for "Shut Up and Kiss Me"?
Bob Dawson: The whole track was cut head-on with Kenny Aronoff (drums), Don Dixon (bass), Benmont Tench (piano), Steuart Smith (guitar), and John Jennings (guitar) — and, of course, Chapin (scratch guitar and vocals). The slide guitar part was an overdub, but Ben's piano solo was live. I think we may have gone back on the piano track and trued it up a little bit — there might have been a chord that we punched in. We recut Chapin's acoustic rhythm guitar to get the vocal leakage out of it and then we recut the vocal.

How did you set the band up for the tracking session?
The album was recorded at Bias Recording in Springfield, VA. We've got one large isolation area that we used for the drum kit and the bass player was in there with Kenny. There's a live area that we had Chapin in for the guitar and vocal. In that same room, at the other end, was the grand piano. There are two smaller isolation booths where we had the guitar amps. J.J. (John Jennings) played in the control room and I fed it to the amp. Steuart was out in the room with Chapin and Ben, but his amp was in a separate area.



EVERYBODY MUST GET *STONE*. The Grammy award-winning Chapin-Carpenter's latest effort.

How did you record the bass?
It was direct. We went through some different things. First we tried recording direct off the bass head, but it was kind of noisy. We tried a De Maria tube direct box, which sounded good but kind of distant. Then we tried an active direct box, but the thing we ended up using (which is my favorite) was an older Jensen transformer that Dean Jensen made specifically for bass. We plugged in Don's bass and there it was — the way it was supposed to be. We used an old (Fender) Jazz bass with real old strings to get that tone.

What about the lead vocal?
Chapin's parts were just scratch parts. We recut the vocal and guitar because the vocal would have been in the acoustic guitar mic. All her vocals were through an old tube Neumann U47 and I recorded her flat to tape through an API 525 compressor. We probably compressed it a little more in the mix with a UREI 1176.

Do you have any problems with the tube U47 sounding different from day to day?
Not too much. The main problem is the humidity control, but the rooms at Bias are real tight that way. All the gear including the mics is turned on and left on all the time — never unplugged, never turned off. It's real good for the stability of the gear. When was the last time you saw a light bulb burn out while it was on? The equipment never gets cool so it reduces the chances of condensation and lowers the chance of the tone changing.

Was the vocal recorded over a few sessions?
Chapin knocked this one out. Generally, on the whole album, I don't think we did vocals on any tune over a period of days. It was more like, "This one is done, now let's go to the next one." Occasionally while mixing we might go back and pop in a line because she changed a lyric. We left the mic set up so that even if we were just about to mix, Chapin could make a change. EQ

World Radio History

ESI-32

EMULATOR TECHNOLOGY. BREAKTHROUGH PRICE.

Looking for your first sampler? Or a reason to retire the one you've got? Look no further. ESI-32 delivers more power than samplers costing twice the price—at a price that will leave you wondering what the catch is.

No catch. No joke. The ESI-32 digital sampling instrument is jammed with the same features that has made the Emulator® IIIx professional digital sampling system indispensable in both studio and performance environments worldwide. Try these on for size...16-bit audio resolution; 32-voice polyphony; up to 32MB of sample memory; complete compatibility with EIIIx, Emax II and Akai S1000/S1100 sound libraries (That's over 50GB!); 32 4-pole digital resonant filters and a variety of powerful DSP functions (like time compression/expansion and virtually distortionless pitch transposition over 10 octaves)...just for starters. We've even included ten user-assignable front-panel trigger keys for playing sounds without connecting a keyboard.

That's right. All those BIG features that used to come with a BIG price tag are now yours for a price that's—small. Standard models start at just US $1,495, to be exact.

While ESI-32 is ideal as a first sampler, it could also very well be your last. Right out of the box, ESI-32's professional features, stellar audio quality and incredible ease of use make it a great value at any price. But ESI-32 also offers expandability so you can customize your unit as your needs grow. Load it up with 32MB of RAM SIMMs, opt for S/PDIF digital I/O and advanced SCSI interface upgrades and replace the onboard floppy drive with a 3.5" Syquest 270MB removable hard drive.

Yep...ESI-32s can be a powerful introduction into digital sampling or ultimately support all of your power-user needs in full-blown studio and performance situations.

Naturally, you're going to want to see how ESI-32 stacks up against the competition. We invite the comparison. We're confident that when you see what you'll have to pay to match ESI-32's features, you'll make the next logical move...through the door of your local E-mu dealer to check it out in the flesh.

E-MU

CIRCLE 87 ON FREE INFO CARD

E-mu Systems, Inc.
P.O. Box 660015, Scotts Valley, California 95067-0015 • 408-438-1921
U.K. E-mu Systems, Ltd., Suite 6, Adam Ferguson House,
Eskmills Industrial Park Musselburgh, EH21 7PQ • 44-031-653-6556

© 1994 E-mu Systems, Inc. E-mu, E-mu Systems and Emulator are registered trademarks, and the E-mu logo is a trademark of E-mu Systems, Inc. All other trade and product names are property of their respective owners.

World Radio History

From Tuva With Love

How Jeff Lorber got the two-voice Tuvan to perform on his new CD

BY LIANA JONAS

You've seen his face on the AT&T DISQ ads (which appeared everywhere *except* here). You got to meet him live and in person at the 1993 AES in New York. Those who heard this man sing his magic were amazed. And now, in true record-industry fashion, he's on an album. The mystery has become a reality, and all the world can listen to the unique two-note throat singing of Kongar-ool Ondar. But how does a man from the remote Republic of Tuva wind up as a featured artist on the Jeff Lorber CD *West Side Stories [Verve Forecast Records]?*

Jeff Lorber is the first American artist/engineer to record the phenomenon known as throat singing at his project studio called JHL Sound. The result is a smooth, rhythmic track appropriately titled "Tuva," which appears on Jeff Lorber's current CD, *West Side Stories.* What's all the buzz about Kongar-ool though? He's a Tuvan throat singer, and what that means is that he is able to simultaneously produce two very distinct notes from his throat. You've got to hear it to believe it. At first you'll hear a low kind of chanting vocal and superimposed on top of it is this high modulating synthesized sound — the second of two notes coming from Kongar-ool's throat. To date, *West Side Stories* is the first album to feature throat singing. Move over you chanting Benedictine Monks, here come the throat-singing Tuvans.

So how did Kongar-ool go from Tuva to a big-city studio? Lorber learned of Kongar-ool's throat singing ability from Ralph Layton, head of the Friends of Tuva. Layton had brought a group of Tuvans along with Kongar-ool over to Cal-Tech University to perform. Lorber attended the performance and decided that he'd like to work with this throat singer from the land called Tuva.

The creation of "Tuva" started with some rhythms generated on Lorber's Akai MPC-60 drum machine. Kongar-ool walked into the studio and began improvising to a groove that the drum machine was pulsing. The recording of the vocals was done dry and flat. The only effect present was the Yamaha REV1 that was added on the returns as an overall reverb. Seven tracks of vocals were recorded and in the end what was used was an 11-bar pass and an 8-bar pass. The two passes were then sampled (Sample Cell) and utilized throughout the song. Lorber used Time Bandit software to change the pitch of the samples in keeping with the tempo of the song. The screen display of the output waveform has both a high frequency and a low frequency component that appear to be superimposed over each other on the same axis.

KONGAR-OOL: Unplugged and seated.

The mic of choice used to record Kongar-ool was the AKG C12, which was run through a dbx 160 compressor/limiter. A single C12 placed about one foot away from Kongar-ool's mouth along with a pop filter was all it took. In regards to recording Kongar-ool, Lorber states, "I'm sort of a meat-and-potatoes engineer who's more of a musician. I just did what I always do when a musician comes into the studio, which is put the mic up, plug it into a limiter, press record, and hope it sounds okay."

Lorber engineered the session on his SSL E Series console along with a G computer and two analog 24-track recorders, the Studer 827 and the Sony JH 24. For editing purposes Digidesign's Sound Designer software was used. Kongar-ool was recorded directly to tape and the original tracks that were recorded are the very tracks that you hear on the CD.

Kongar-ool has since returned to Tuva, certainly with many tales to tell his fellow Tuvans about his recording debut in America. EQ

TWO PERFOMERS, THREE VOICE Jeff Lorber and the bi-vocal Kongar-Ool Ondar.

World Radio History

3M DIGITAL AUDIO

Do your ears have a vision?

In the audio industry, success depends upon vision. It's vision that gives our ears not just the ability to hear, but to create. It's what makes an innovator an innovator and others mere spectators.

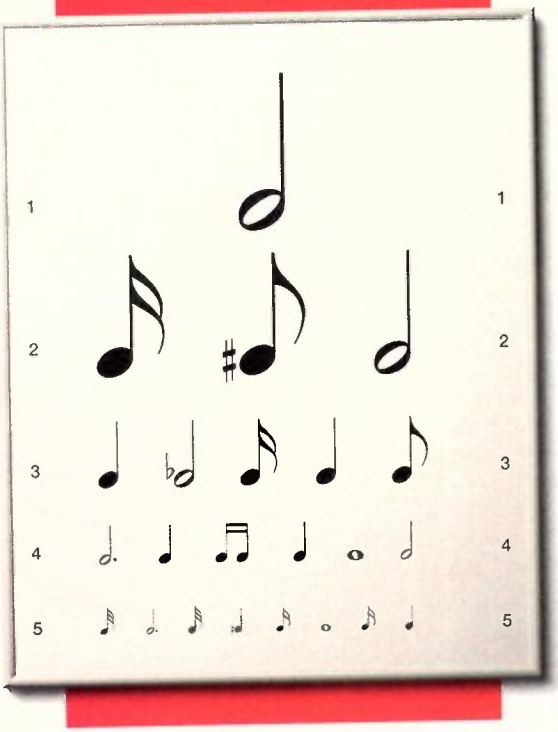
A few years back, 3M had a vision. We set out to produce the fullest line of digital recording media for audio professionals. The result can be summed up in two words: mission accomplished.

First, there's 3M™ 275LE – an open-reel, digital tape which delivers clear, clean sound for the most critical music mastering. Next in line are 3M ASD (for studios that want to hear unparalleled sound from their ADAT® recorders) and 3M AHD (for incomparable sound from audio Hi-8 recorders). Where others might stop, our list keeps going with 3M DAT, 3M Audio U-matic Digital (AUD), and for professionals who are after the latest in digital recording, there's 3M CD-Recordable and Magneto-Optical Disks. Finally, 3M 8mm and 4mm Data Tapes are perfect for back-up and archiving.

3M Digital Audio Media

Our analog tapes have built a reputation for performance and reliability. Our digital line lives up to that high standard in every respect. So it comes as no surprise that 3M digital audio recording products have consistently low error rates throughout.

Picasso had his paint and canvas. Shakespeare had his pen and paper. You have your ears and 3M Digital Audio. So what's your vision? For more information on our full line of professional digital audio products call 1-800-752-0732.



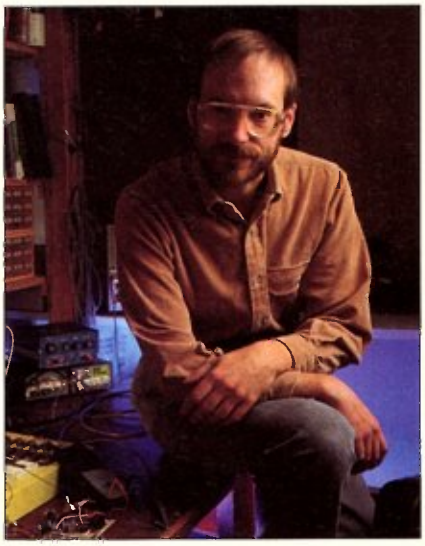
3M Reliability

©1994 3M Audio and Video Products Division, St. Paul, MN 55144-1000

CIRCLE 01 ON FREE INFO CARD

World Radio History

Doing Windows 95



Will Microsoft win in '95 with Win95?

BY CRAIG ANDERTON

The PC is getting hotter and hotter for music applications, and Microsoft is doing what it can to maintain the momentum: Windows 95 (Win95 for short) represents a major break from the Windows 3.1 operating system (OS), and offers the same kind of overhaul for the PC that System 7 did for the Macintosh. Here's the scoop on what these changes mean for the project studio.

FROM THE GROUND UP

Although some people debate how much Win95 is or is not like the Mac interface, to me the point of reference for a Win95 machine is the late, great Amiga. Multitasking, wavetable synthesis, digital audio, and graphics that can do 3D background scrolling — we've seen it all before, only now it's called multimedia. But Win95 "virtualizes" much of what the Amiga did in hardware, which means more flexibility and more "extensible" technology; in other words, programs that run decently on a base level computer run fabulously on a top-of-the-line model. And Win95 is being promoted as a multimedia computer OS just as CD-ROMs are really starting to take off, which is going to inundate a lot of consumers with computer-created sound and vision.

AUDIO/VIDEO PROJECT STUDIO

It used to be that if you wanted to do video, you needed several tape decks, switchers and synchronizers, an editor, and several other accessories. Win95's emphasis on graphics and audio/video integration makes it a natural candidate for an A/V studio in a box. Already, 16-bit sound cards are commonplace and can handle the digital audio; soon, inexpensive Win95-based video cards will offer video capture, JPEG compression, 3D, and special effects. You're ready to roll once you team these with a big hard disk, video camera, and — the secret ingredient for desktop video — data compression, which makes the amount of data manageable.

SQUEEZE ME, PC

Multimedia puts tremendous demands on a computer. As a result, Win95 machines have a number of features designed to improve throughput, starting with true 32-bit architecture for everything from reading data from the disk, to decompressing data, to displaying it on-screen. Still, that's not always enough — which brings us to data compression.

Win95 includes two groups of audio compression/decompression (codec) algorithms: music-oriented codecs (such as IMADPCM, which compresses audio into about one-quarter the size with reasonably good fidelity), and voice-oriented codecs such as TrueSpeech, which provides about a 15:1 reduction in data. You can even compress a recording in real time.

Win95 has video compression too. Together with the Open PC MPEG consortium, Microsoft has thrown its weight behind MPEG by developing an industry standard for MPEG board and chip makers. MPEG is a logical choice for most applications because it's standardized, creates small files, and is well-suited to the data rates that a double-speed CD-ROM drive can sustain. Unlike most MPEG decompressors that require specialized hardware, however, Win95 uses software-based decompression. (For example, the Mediamatics MPEG Arcade Player, when running on a 90 MHz Pentium-based system, can decompress 24-30 frames-per-second MPEG data streams with 8- or 16-bit color.)

MULTITASKING

Win95 includes true multitasking; tasks such as data compression, artwork rendering, and others can run in the background. This means if you use an integrated sequencer/hard disk recorder, you should be able to continue sequencing while displaying the video to which you're synchronizing. Or perhaps you can do something like apply complex signal processing to the digital audio while the computer is busy crunching numbers.

You'll no longer need to do computation-intensive operations serially; several processes can go on at once. In theory, you should be able to just set up a bunch of operations on several different pieces of digital audio (compress track 1, add parametric EQ to track 2, reverb and limiting to track 4, etc.), then walk away while the machine batch processes.

Another benefit to multitasking: a Win95 machine is also an audio CD player that works in the background, with its own "Audioshop"-like control panel built right into the system.

World Radio History

"ONCE YOU'VE REACHED THIS STAGE, YOU'D BETTER HAVE YOUR ACT TOGETHER."

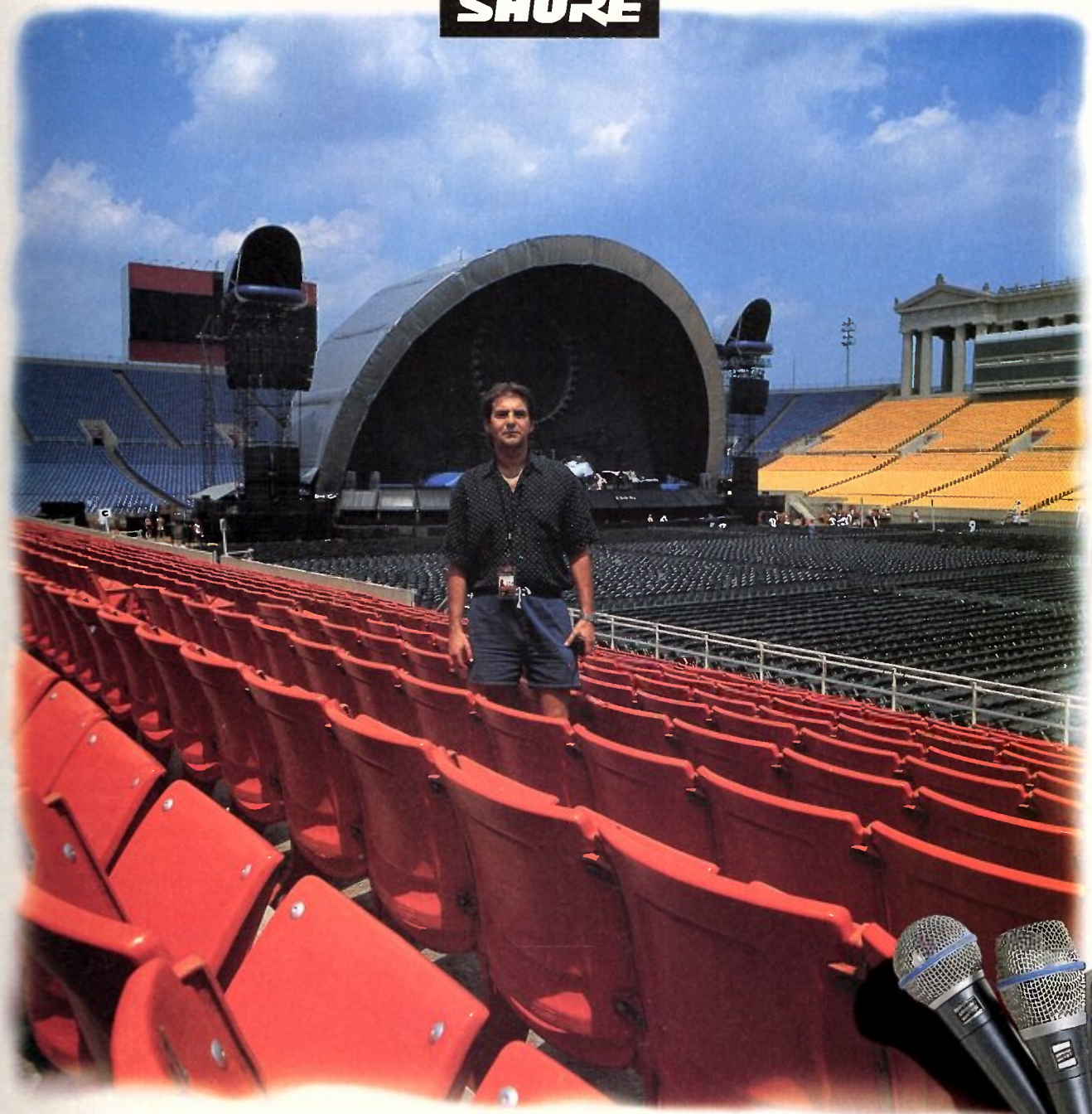
After more than 20 years of touring with **Pink Floyd**, monitor engineer **Seth Goldman** has some firm opinions about music and microphones.

"Pink Floyd's live performances are complex, both technically and artistically," says Seth. "There's just no margin for error. For this tour, I'm using 48 Shure microphones on stage, including eight Beta 87s for vocals. Their extended highs are outstanding. So is the gain before feedback. And reliability is a given. I have full faith in every one. They've earned it."

Shure Beta. It may be just what you need to reach the next big stage in *your* career.

To learn more, call 1-800-25-SHURE.

SHURE



Seth Goldman, Pink Floyd Monitor Engineer, Soldier Field, Chicago.

CIRCLE 86 ON FREE INFO CARD

World Radio History

POLY WANNA MESSAGE?

Regarding MIDI, in addition to including OMS (see the March 1995 MI Insider), Microsoft has a new technology called Polymessage Support. This lets Win95 communicate multiple MIDI messages simultaneously within a single interrupt; you can time-stamp streams of MIDI data, and the system deals with them as needed to take some of the load off the CPU. This allows more "bandwidth" for processing MIDI, graphic, and other data types simultaneously.

THE ENHANCED CD

Microsoft is also working with Sony and Philips to develop a new multisession CD format (multisession CD drivers are already built into Win95). This "enhanced" CD redefines mixed media CDs so that Red Book-standard audio tracks represent the first session and play first; this is followed by the various Yellow Book CD-ROM data tracks (videos, lyrics, pictures, etc.) that make up the second session. The music industry expects the enhanced CD to sell for a few dollars more than conventional CDs. The audio portion will typically run around 50–60 minutes, with the remainder allocated for data.

The only problem is that, currently, the Yellow Book format for mixed media specifies that the audio portion must go through the computer's sound card, which virtually guarantees that tracks played through a stereo system will sound better than tracks played through the computer. Hopefully this will be fixed before it becomes a standard.

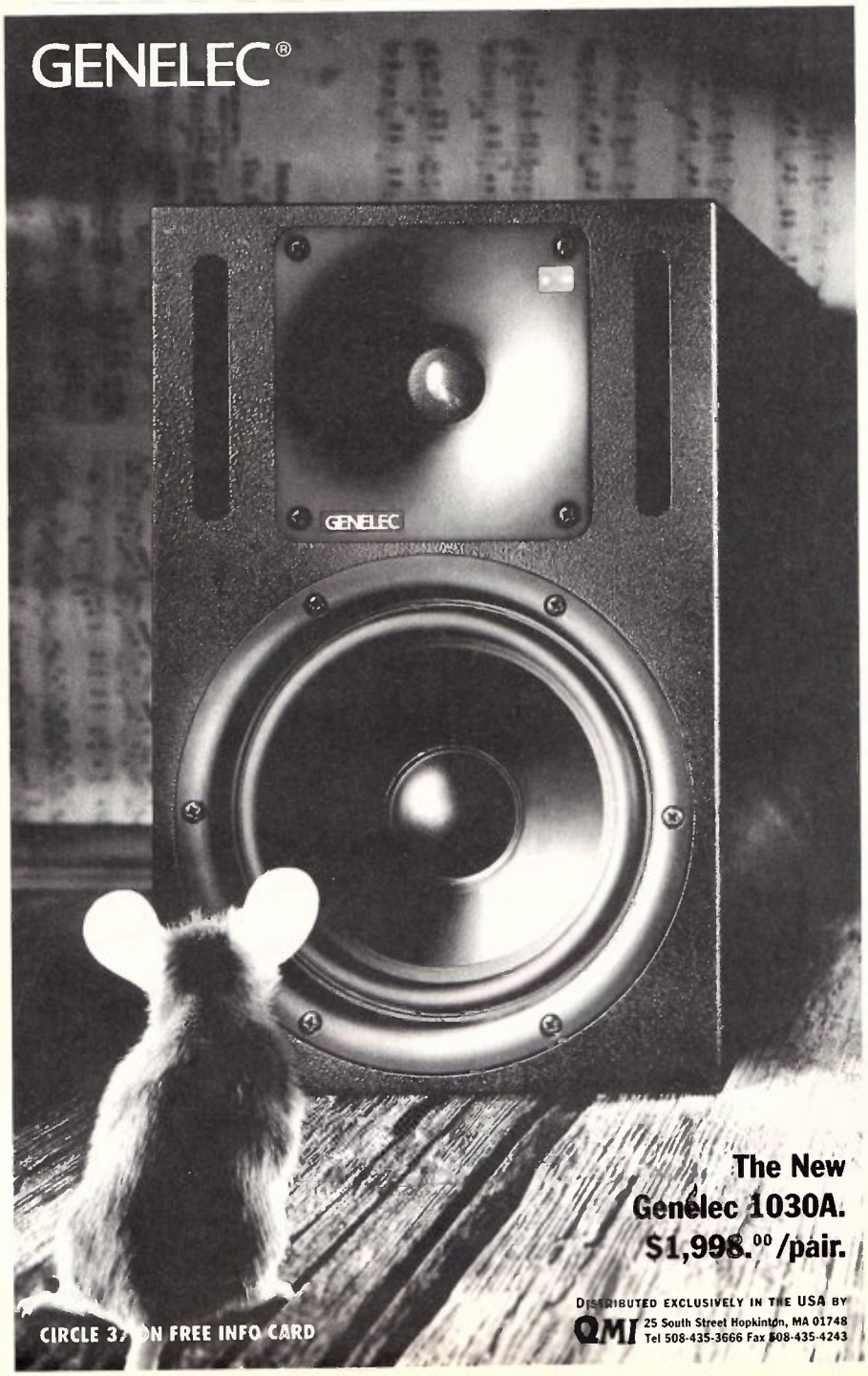
BUT WAIT! THERE'S MORE...

We've only covered some audio/video aspects of Win95, but there's more — such as built-in software for the Microsoft Network (their version of CompuServe/AOL), file synchronization between laptop and desktop computers, simplified user interface, and "plug and play" (where the system recognizes peripherals and installs them transparently, hopefully putting an end to one of the most arcane aspects of PC operation).

In any event, Win95 promises to deliver a standardized, high-performance audio and video platform that, while targeted to the mass market, contains enough enhancements to ensure that the PC will continue to heighten its profile in the project studio. If Win95 indeed hits its August 1995 release date, the January 1996 NAMM show is going to be pretty interesting.

Note: For up-to-date info on Win95's progress, go online (GO WINNEWS on CompuServe, keyword WINNEWS on AOL, jumpword WINNEWS on Prodigy, WINNEWS download area in Windows RTC for GEnie, ftp.microsoft.com/peropsys/win_news on the Internet, and http://www.microsoft.com on the Worldwide Web).

Craig Anderton not only lives in cyberspace, he has a gig there. America Online subscribers can access articles, samples, news, and forums in "Craig Anderton's Sound, Studio, and Stage" area. Use keyword SSS or ANDERTON.



World Radio History

NOT JUST A PROMISE

SOUNDTRACS

Some console manufacturers promise automation. Some cannot even offer that. Soundtracs, however, delivers.

A comprehensive VCA fader and mute automation package to compliment the immensely popular Topaz Project Studio. No add-on fader bays and no insert points used. Just a simple, elegant and seamless installation incorporating a 1U rack interface (TACU), controlled by intuitive, easy to master software running under Windows 3.1 on a conventional (386 or higher) PC.

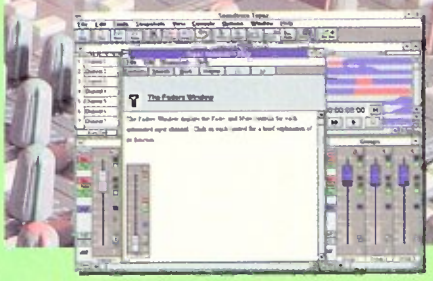
It's all there; dynamic frame accurate fader & 1/4 frame accurate mute automation, MIDI Time Code sync to 4 rates, custom 'zipper noise eliminating' algorithms, 8 software VCA groups, interactive HELP, snapshot record/recall, mute/event nudge, extensive off-line mix editing, extensive software zoom facilities, plus MIDI machine control.

And that's only the half of it.

To obtain full details, contact your local Soundtracs Dealer or call Soundtracs direct.

We know you'll be impressed.

And that is a promise.

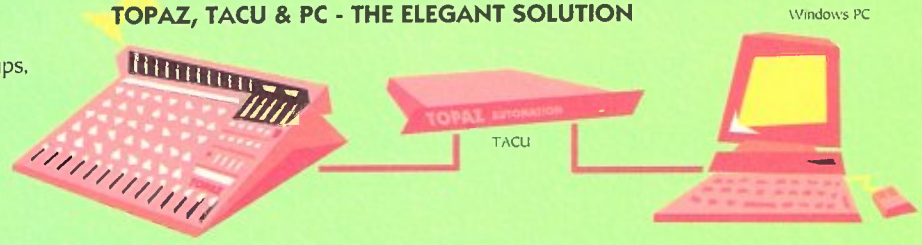


Intuitive on-line HELP is available for all aspects of the software

Software gives complete graphic editing of faders, mutes & VCA groups

No external fader bays, no insert points used, a completely seamless installation with the Topaz Automation Controller Unit, (TACU), interfacing between console and PC.

TOPAZ, TACU & PC - THE ELEGANT SOLUTION



TOPAZ

AUTOMATED PROJECT CONSOLE

Soundtracs distributed in the US by: **SAMSON TECHNOLOGIES CORP.** PO Box 9068 Hicksville NY11802-9068. Tel: (516) 932 3810. Fax: (516) 932 3815

CIRCLE 61 ON FREE INFO CARD

World Radio History

The ProMix Experiment

How I used Yamaha's digital mixer to record Thursday Diva and The Lynn Arriale Trio

BY TOM JUNG

Way back in 1977, before anyone had dreamed of the compact disc, Tom Jung was making digital recordings on a prototype digital 2-track tape machine manufactured by 3M. Jung was convinced that digital recording was the future and formed Digital Music Products (DMP) in 1982. Over the past two years, DMP made more than twenty recordings using 20-bit recording technology to obtain wider dynamic range, better resolution, and lower distortion. Jung and DMP artists have been nominated for Grammy awards in the areas of Best Engineered Recording, Best Contemporary Jazz Performance, and Best Large Ensemble. Recently, Tom Jung and Yamaha combined to produce a CD, The ProMix Sessions, *which extensively used the Yamaha ProMix 01 digital recording console. Here is Jung discussing the project in his own words.*

PREMIXING ON THE PROMIX

The first project I used the Yamaha ProMix 01 was a new act called Thursday Diva. For a label like DMP, this project was very different musically, and the recording process was more typical of a pop record. We started by doing a prerecord of synths (the rhythm section would be recorded live with a click and the prerecord later on). We used the ProMix 01 to premix and convert to digital complex synth sounds before recording them. For example, (producer/composer/ keyboardist/percussionist) David Charles might use 8 or 10 inputs of the 01 to create a Rhodes or string sound and then we would record that sound onto two tracks of the 20-bit Yamaha DMR8 mixer/ recorder. Some synths have an output level somewhere between line and mic level and present a bit of a problem to the mixer input — too hot for mic level, too low for line level. But the input sensitivity of the ProMix 01 was nicely matched to the output level of the synths and made it a great high-quality interface between the synths and the digital world.

The digital output of the ProMix 01 was at 48 kHz, S/PDIF, and this output is actually 20-bit. I wanted to record onto a format that could accommodate the extra resolution

Photo by Julian Jaime

THE JUNG AND THE RESTLESS: The Lynn Arriale Trio gets a lesson in ProMixing from Tom Jung (second from right).

World Radio History

TANNOY®

Get Real

PBM II

For more than three-quarters of a century, Tannoy has been designing and producing loudspeaker systems and components to meet the demands of the world's most demanding user. A philosophy of constant research and investment in state of the art materials, technology and processes enables Tannoy to ensure that every monitoring system we produce will re-produce absolute fidelity to the source, true dynamic capability, and most importantly, real world accuracy. This is why Tannoy systems are used in more of the world's professional facilities than any other brand.

In the North American marketplace, Tannoy has been the number one monitor of choice for several years according to the Billboard's international recording and equipment statistics. This clearly illustrates why Tannoy enjoys its reputation as the world's leading manufacturer of reference loudspeakers. In fact, **leading the market is what Tannoy is all about.** While other multi-faceted manufacturers, not dedicated solely to the art of reference monitor loudspeakers, scurry to produce products to compete with Tannoy's original highly acclaimed and award-winning PBM series, **Tannoy moves on.**

TANNOY
HEAR
BELIEVE

The new PBM II series, once again, is setting new standards in the industry. Pioneering new technologies such as **variable thickness, injection molded cones with nitrile rubber surrounds** are but one fine example of our dedication to perfection. The new molded cones are stiffer than conventional cones producing more linear extended low frequency. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange. They are immaculately consistent and durable for years of faithful trouble free use. From the high power polypropylene capacitors to the hardwired minimilist crossover, every component has been carefully selected for the new breed of PBM II series. When leading edge technology is so affordable, *Get Real.* Don't settle for second best.

Tannoy/TGI North America • 300 Gage Avenue • Kitchener, Ontario, Canada • N2M 2C8 • 519 745 1158 Fax: 519 745 2364

CIRCLE 64 ON FREE INFO CARD

World Radio History

rather than a standard 16-bit machine. With that in mind, I ran the ProMix 01 output through a dB Technologies dB3000 Digital Optimizer for data format and sample-rate conversion (this unit is among the best I've heard). Then the output of the dB3000 (now at 44.1 kHz and in the AES/EBU format) was sent to a Yamaha FMC-9 format converter to change the signal into Yamaha's 8-channel proprietary Y2 format. With the signal now in the Y2 format, I could feed it (via 25-pin cable) into a Yamaha DMR8 digital multitrack recorder, which is capable of recording digital audio at 20-bit resolution.

Once the synth tracks were recorded, we were ready for the rhythm section. Due to the nature of the music, I opted for close-miking the drums with a beyerdynamic M 380 (for the kick), Shure SM-57 (snare), Shure SM-98's (toms), and a pair of beyerdynamic M 160 cardioid ribbon mics overhead (arranged in an ORTF pattern). Since I find that ribbon mics typically have a low output level, I use a custom-modified PSE (Minneapolis, MN) stereo, class-A discrete mic "pre" preamp unit as close to the mics as possible and then run the amplified signal down the main cable length. The mics were all connected to the inputs of the ProMix 01 then through the same dB3000/FMC-9/DMR8 chain as for the synths.

YOU LIKE TO WATCH, DON'T YOU: Jung records the trio from the control room.

At the same time, Wayne Pedzwater's electric bass was recorded on the DMR8 using a Westlake D-1 direct box and a Wadia WA4000 A/D converter. The Westlake DI actually has enough output to drive the input of the Wadia converter. Chuck Loeb's electric guitar rack had a DI built-in and we generally recorded it direct via a Lexicon

AFFORDABLE SAMPLE RATE CONVERSION – THE MISSING LINK IN YOUR DIGITAL CHAIN.

z-link and *z-link+* MINI SAMPLE RATE CONVERTERS

You've invested in DAT and CD machines, samplers, MiniDisc recorders, CDRs, digital audio workstations, and digital consoles, but you've problably found that linking them up in the digital domain is easier said than done. The new **z-link** and **z-link+ palm-sized sample rate converters** let you keep it digital. And at **$349** (z-link, sugg.), there's no excuse for going analog again.

ZSYS.

Z-Systems Audio Engineering
4641-F NW 6th Street
Gainesville, Florida 32609
Tel: 904-371-0990
Fax: 904-371-0093

CIRCLE 75 ON FREE INFO CARD

World Radio History

Pedzwa-
d on the
rect box
nverter.
enough
e Wadia
ic guitar
general-
Lexicon

VERTERS

lio Engineering
n Street
prida 32609
990
093

THIS TIME IT'S PERSONAL

The new PRSII in~ear monitoring system is a discovery that every performer can afford to make.

For less than the cost of a monitor speaker system, artists can hear themselves with a clarity and precision that blows away traditional set-ups.

Each performer's monitor mix is delivered in stereo, via a powerful UHF transmitter and receiver, directly to his or her earpieces. The artist is liberated, free to perform.

PRSII is also a personal investment, safeguarding the performer's most precious assets, his ears and his voice.

Volume is controlled by the artist, protecting against voice fatigue and conserving hearing. And it costs less in the long run: quick and simple set-up, minimal transport expense, easy to store.

PRSII. Take it personally.

In~ear Monitoring Technology by Garwood

GARWOOD

The Firehouse,
176 Norman Avenue,
Brooklyn NY 11222
Tel: 718. 383 5606
Fax: 718. 383 8004

Manufactured in the UK & Eire by Garwood.

CIRCLE 94 ON FREE INFO CARD

World Radio History

STOP WASTING TIME & MONEY
LOWEST PRICES-GUARANTEED!!!!
All products are professional quality and are backed by 100% Money Back Guarantee.
WE BEAT ANY PRICE!
- 10 pieces to 1000 pieces
- DAT Tape, all lengths
- 4mm DDD-MRS and 8mm Data Grade
- CD-R's 18, 63, 74 minutes non-logo
- Chrome audio cassettes all lengths
- 3.5" & 5.25" Magneto Optical Disks
- All products are available in bulk, wrapped and include labels and inserts.
- All orders shipped same day.
- All major credit cards accepted.

Call today
1-800-522-2732
APDC
Englewood Cliffs, NJ

CIRCLE 26 ON FREE INFO CARD

THE PROJECT STUDIO EXPERTS
CALL TODAY FOR A FREE CONSULTATION
203.442.9600
CARUSO MUSIC
all major brands • sales & service
20 Bank Street
New London, CT 06320
203.442.9600
203.442.0463 (FAX)

CIRCLE 18 ON FREE INFO CARD

20/20 converter. Live percussion performed by David was recorded with a pair of Shure SM-81's feeding two FM Acoustics (Switzerland) preamps. Overdubbed percussion was recorded in the main room of The Carriage House with a Shure VP-88 stereo condenser mic placed about 6 feet over David's head. By not miking the percussion too closely I was able to maintain some of the "space" of the live room at The Carriage House. The VP-88 was connected into the ProMix 01 and then through the dB3000/FMC-9/DMR8 chain. These instruments were recorded onto individual tracks of the DMR8 and the project was later mixed directly to my Digital Audio Labs workstation.

THE LYNNE ARRIALE TRIO

The Lynne Arriale Trio is a traditional jazz trio with Lynne Arriale on piano, Drew Gress on bass, and Steve Davis on drums. I used the ProMix 01 exclusively to record this ensemble for the *The ProMix Sessions* CD. Our plan was to record the trio live-to-stereo at The Carriage House. For maximum isolation, the drums and piano were set up in separate live rooms while Drew Gress was set up in a booth with his acoustic bass.

MIKING

The drum kit was miked with four microphones. For the kick drum, I used a beyerdynamic M 380 (bidirectional) moving coil mic. I find that this large-diaphragm mic can provide a lot of proximity effect, and by moving the mic's position relative to the drum, I have a lot of control over the tonal balance of the sound. I placed a Shure SM-80 omnidirectional condenser mic underneath the snare drum and used it to pick up both a little bit of buzz from the snare drum and some crack from the kick drum. By using one omnidirectional mic in this position, I avoided the phase cancellation that might have occurred if I had placed directional mics on both the kick and the snare. The overhead mic was a single Speiden SF-12 bidirectional stereo ribbon mic that has the elements arranged in a Blumlein pair. Like all ribbon mics, the output of the SF-12 is very low, but the mic inputs of the ProMix 01 have enough quiet gain to bring up the level of the SF-12 without adding a lot of noise.

For the piano I used a pair of beyerdynamic MC 834 cardioid condenser mics, one placed about 20 inches away from the hammers and another placed over the bass strings. I have found that the only way to really capture the low-end weight of the piano is by using a mic on the low strings. The acoustic bass was miked with a second beyerdynamic M 380 placed just above the bridge. Again, I used this mic due to its big proximity effect, which allows me to get the real bass fundamental frequencies through placement of the mic from around 18 to 24 inches from the instrument.

All of these mics were connected to the ProMix 01 where the signal was converted to digital with the internal 20-bit analog-to-digital converters. Once the signals were in the digital domain, I could apply equalization and add a bit of reverb. The ProMix EQ is very transparent, and I like that quality for this type of music. I used Yamaha's internal DSP for reverb and ambiance programs that were set up on separate sends of the ProMix. None of the signals were processed dynamically — that aspect was left up to the musicians.

STAYING DIGITAL

I always like to stay in the digital domain right through to the CD mastering process, so the digital output of the ProMix 01 was again run through the converter/FMC-9/DMR8 chain. But this time I used a Z-Systems unit for the sample rate and format conversion and recorded live onto two tracks of the DMR8. Ultimately this data would be transferred into my Digital Audio Labs workstation for mastering using Editor+ software. When I transferred the data into the workstation, I had to redither down to 16-bits for CD mastering. By recording at 20-bits I get a noticeable improvement in the sonic resolution and I can leave a little headroom. Then when I redither to 16-bit, I can push the signal level right up to "0" and take advantage of the 16-bit system. For the Lynne Arriale project, the mastering process was really just transferring and sequencing of the songs and optimizing the level of each song; the hard part was already done.

To obtain a copy of the The ProMix Sessions *CD call Yamaha at 800-937-7171 x540.* EQ

World Radio History

BY POPULAR DEMAND

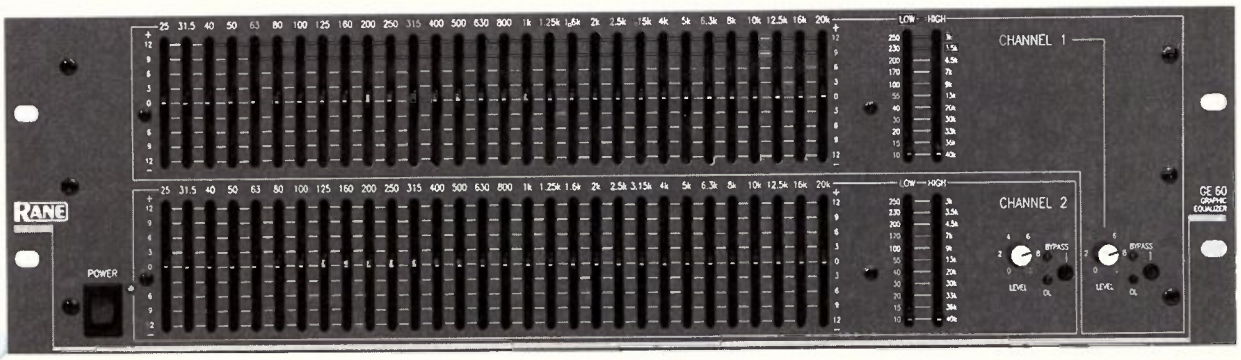
The GE 60 Stereo 1/3-Octave Equalizer:

The Crowd Pleaser

The company that first brought you Constant Q with its easier operation and more precise feedback control is also the company that listens: to its products and to You.

You asked for Rane reliability and Constant Q performance in a stereo 1/3-octave format, with precision calibrated 45mm sliders for better control resolution.

We give you the GE 60: • *With interpolating Constant Q filters, meaning you can achieve feedback control between ISO frequencies due to the narrow yet ripple-free combined response of two adjacent filters.* • *With sweepable high and low filters.* • *With Balanced 3-pin and 1/4" TRS and terminal strip input and output connectors.* • *With calibrated 45mm sliders featuring grounded center detents for flat response and low noise.* • *With UL Safety Agency approval for use in any venue.*



Okay, so we gave you more than you asked for. For a lot less than you thought you'd have to pay.

We thought you'd be **pleased.** And so will your audience.

So what else is new from Rane?

PURITY BY DESIGN
RANE
MADE IN USA

RANE CORPORATION
10802-47th Ave.W.,
Mukilteo, WA 98275
(206) 355-6000
Fax (206) 347-7757

P U R I T Y B Y D E S I G N™

CIRCLE 55 ON FREE INFO CARD

World Radio History

Why Use Personal Monitor Mixers?

Scan these personals and find out how to please everyone

BY WADE MCGREGOR

In a recording studio, musicians often ask for separate balances on their individual headphone mixes. Players often have special requirements for monitoring their own sound in balance with other musicians; in some cases, certain instruments are very important for pitch or timing and other instruments simply confuse these issues. Meeting such requirements will often necessitate a separate mix derived from the auxiliary sends on a mixing console. Once you are faced with more than a few such "custom mixes" even large mixing consoles begin to run out of auxiliary busses.

The personal monitor mixer allows each musician to take a feed from the main console (a stereo mix or separate sub-groups of instruments) into the personal monitor mixer line inputs and then feed his or her instrument into a separate (mic or line) input on the personal monitor mixer. The auxiliary send from the main console is simply daisy-chained between multiple personal monitor mixers, and each instrument is passed through a personal monitor mixer and then to the main mixing console. (Of course, it wouldn't be necessary to have a personal monitor mixer for every musician, just those having the most difficulty hearing themselves in a common monitor feed.)

The personal mixer provides an easy way to offer individual variations on a mix while preserving the original source-mix for daisy-chaining onto the next mixer. Trying to do this on smaller mixers — especially the portable multitrack systems — can be nearly impossible due to the lack of more than one or two auxiliary busses and channel inserts. If you regularly need to have just one more auxiliary output on your mixer, then consider adding a personal mixer.

The personal monitor mixer can also be used in live applications where the line-level mix output can drive a powered stage monitor or high-efficiency headphones. For instances where the drummer must work to a click track that no one else needs to hear, the personal monitor mixer can save using up a separate auxiliary send on the FOH or stage monitor mixing console just for the drummer's headphones. You could also use ear phones on-stage with these personal mixers. If the performers don't move around too much, then the wire may not be a problem. If they are the more choreographic types, then the personal monitor mixer could still provide them with personal control over the mix in their wireless system. These tiny mixers could be used at the main monitor mixer to solve the problem of creating a separate mix for wireless in-ear stage monitoring by providing a submix for each wireless system.

By providing an instant cure for the "just one more channel/just one more monitor mix" syndrome, the personal monitor mixer could be a great asset to the recording or live-sound engineer who needs a simple and effective fix for this inevitable problem. The unit also offers some security to musicians that regularly perform with different sound crews and equipment. By having control over their own instrument or voice to their monitor, they can be assured that even if they can't hear the perfect monitor mix every night, at least they can hear themselves!

HEY LOOK!: There are three reviews of personal monitor mixers in this article!

REVIEW: LANGEVIN HPA-100

The Langevin HPA-100 mixer is intended primarily for studio applications where multiple submixes can be used to create a personal mix for demanding artists. This table-top unit (with an optional mic stand mount) features high-quality components such as Alps 60 mm-throw faders, pan-pots on the mono inputs and even a talkback mic. A multifunction

World Radio History

AMEK

RN EQ

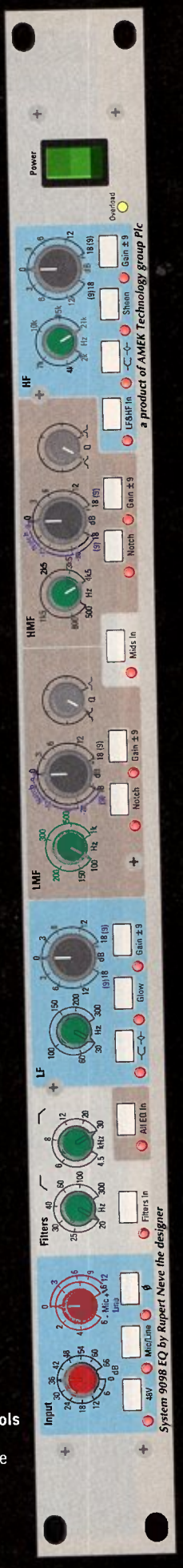
The EQ
The tradition
The pedigree

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

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

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

Rupert Neve



AMEK

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

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

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

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

CIRCLE 80 ON FREE INFO CARD

World Radio History

LANGEVIN HPA-100 STUDIO HEADPHONE SYSTEM

Manufacturer: Manley Laboratories, Inc., 13880 Magnolia Avenue, Chino, CA 91710. Tel: 909-627-4256.

Input 1–4: balanced line-level mono 1/4-inch phone jack; 60 mm fader ; pan pot; paralleled on female 25-pin sub-D connector

Input 5–6: balanced line-level stereo 1/4-inch phone jacks; switchable mono, stereo or stereo simulation; 60 mm fader; paralleled on female 25-pin sub-D connector

Talkback (in): internal talkback microphone mounted in top panel; interrupt or talk-over input signals via sub-D connector; DC control of muting or talk-over mode from external source(e.g. control room talkback system); custom external wiring can allow private talkback to individual units from control room; LED indicators for talk-over (green) and interrupt (red) modes

Output 1–6: male 25-pin sub-D connector; parallel of inputs

Mix: male 25-pin sub-D connector; includes tone controls, headphone volume and mute settings

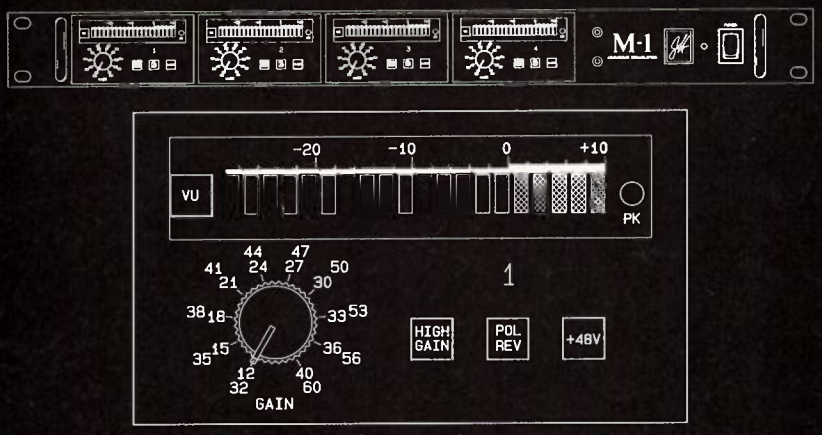
Talkback (Out): male 25-pin sub-D connector ; talkback signal from internal mic before "Talk" button

Headphone: four 1/4-inch stereo headphone jacks; bass and treble controls (+/- 12 dB); 0.1 ohm output impedance; multimode mute button; headphone output of up to 21 Volts RMS

List Price: $880 **EQ Free Lit. #:** 120

M-1

MICROPHONE PREAMPLIFIER



(ACTUAL SIZE)

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

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

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

DC SERVO and INPUT BIAS CURRENT COMPENSATION
eliminate all coupling capacitors and degradation they cause.

Standard equipment: illuminated push-buttons, shielded toroidal power transformer with 6-position voltage selector switch, silver plated XLRs, ground-lift switches, phantom power, polarity reverse and gain controls. Options include the Jensen JT-11-BM output transformer, VU-1 meter (shown), PK-1 meter, gold plated XLRs.

THE JOHN HARDY COMPANY
P.O. Box AA631
Phone: (708) 864-8060 Evanston, IL 60204 Fax: (708) 864-8076

mute switch allows the user to switch off the left, right, or both channels — a feature that provides a handy way to minimize leakage from headphones that are used on one ear only or temporarily laying near a mic stand.

Langevin is the solid-state branch of Manley Labs. The HPA-100 is a distinctive-looking mixer with bright red side panels, black faceplate, and metal vent screen bottom plate. The unit offers very high output capability (see the specs sidebar) and the tone controls are well designed to enhance music for headphone listening. Although basic, the clearly labeled (no actual dB indications, though) controls have a smooth, deliberate feel in operation. The muting, overload, and talkback status are indicated by large LEDs.

There are two 25-pin sub-D connectors on the rear panel. This unusual connector (for audio) was chosen to allow all six input channels, including two stereo channels, to be daisy-chained between units. These compact multipin connectors provide access to all the channels plus control signal and audio for an interruptable control room talkback signal. It is even possible to address individual units in a studio using multiple units, by wiring each unit

MINI-MIXER: Langevin HPA-100

CIRCLE 69 ON FREE INFO CARD

World Radio History

MidiVerb® 4

Clean, Quiet, Rich

Forget what you know about digital multieffects processors, the new Alesis MidiVerb 4 has rewritten the book. While the competition has been chasing the standards set by three generations of MidiVerbs, our engineers were researching ways to integrate the form and function of digital reverb way beyond anybody else's imagination...or capabilities. It makes the MidiVerb 4 the cleanest, quietest, richest sounding and, yes, the smartest machine of its kind. Here's how...

Advanced Fully Integrated 18 Bit Architecture

Alesis is the world leader in full custom VLSI design for audio applications, so MidiVerb 4's 20 Bit DSP engine is so advanced it eliminates massive quantities of discrete circuitry, making it a revolutionary blend of electronic design and functionality. And to insure state of the art performance, the input is sampled at the professional standard 48kHz sampling rate via 18 Bit,128 times oversampling A/D converters.

The Power of Great Sound

MidiVerb 4's superb reverb and effects algorithms are the direct result of our ten year mastery of the art and technology of sound. Dense, natural reverberation, and rich chorus, delay and pitch effects deliver unbeatable sonic performance. 20kHz bandwidth, 90dB signal to noise ratio, 18 Bit and 8 times oversampling D/A converters combine to make MidiVerb 4 perfect for even the most pristine digital recording.

Fast, Fun, Flexible

But great sound is only the beginning. You get 32 full Stereo configurations, as well as powerful independent Dual Channel Parallel Processing. Plus, a special Cascade mode allows the output of channel 1 to feed the input of channel 2 in any of 7 dual channel configurations. A large custom backlit LCD, data entry wheel and clearly labeled buttons comprise the front end of MidiVerb 4's fast, intuitive user interface. Four parameters are shown simultaneously and there's even screen help prompts to put you at ease if there's ever a programming question. You can tweak one of the superb 128 preset or 128 user programs, or start from scratch and get the sound you need in no time.

Auto Level Sensing™

No, this won't tell you if your car's on a hill. But, if you want to start mixing in a flash, or the drummer's starting the count and you just plugged in, our exclusive Auto Level Sensing feature automatically sets the input level for optimum use of MidiVerb 4's wide dynamic range, so you'll never have to trade off patience for excellent sound.

It's a MidiVerb

Of course, because it's a MidiVerb, you can modulate effect parameters in real time via MIDI, select programs, and automate your effects during mixdown with a MIDI sequencer.

MidiVerb 4 is based on a classic theme, but it's new in every way. And as always with MidiVerb, the best part is the price. See your Alesis Dealer.

and Smart

For more information on the MidiVerb 4, call 1-800-5-ALESIS or see your Authorized Alesis Dealer.
® MidiVerb is a registered trademark, Auto Level Sensing is a trademark of Alesis Corporation.

ALESIS STUDIO ELECTRONICS

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016 1-800-5-ALESIS ALECORP@Alesis1.usa.com

CIRCLE 06 ON FREE INFO CARD

World Radio History

PERTEK ENGINEERING MONITORMATE

Manufacturer: Pertek Engineering, Inc. 22431-B160 Antonio #469, Rancho Santa Margarita, CA 92688. Tel: 714-858-1685
Input 1: balanced XLR; mic-mix level control
Input 2: unbalanced line level stereo 1/4-inch phone jack; switchable line or loudspeaker level; single stereo line-mix level control
Power: captive AC power cord ; internal power supply; power on LED indicator; ground-lift switch disconnects audio ground from AC ground
Output 1: balanced XLR; parallel of input or switchable to processed (variable mic-output level control)
Output 2: unbalanced stereo 1/4-inch phone jack; parallel of stereo line/spkr input.
Mix: balanced 1/4-inch phone jack; line level with bass and treble (+/- 20 dB) controls
Speaker: 1/4-inch phone jack; 15 watt mono internal power amplifier output
Headphone: 3.5 mm miniature stereo headphone jack; 20 ohm output impedance
List Price: $349 **EQ Free Lit. #:** 121

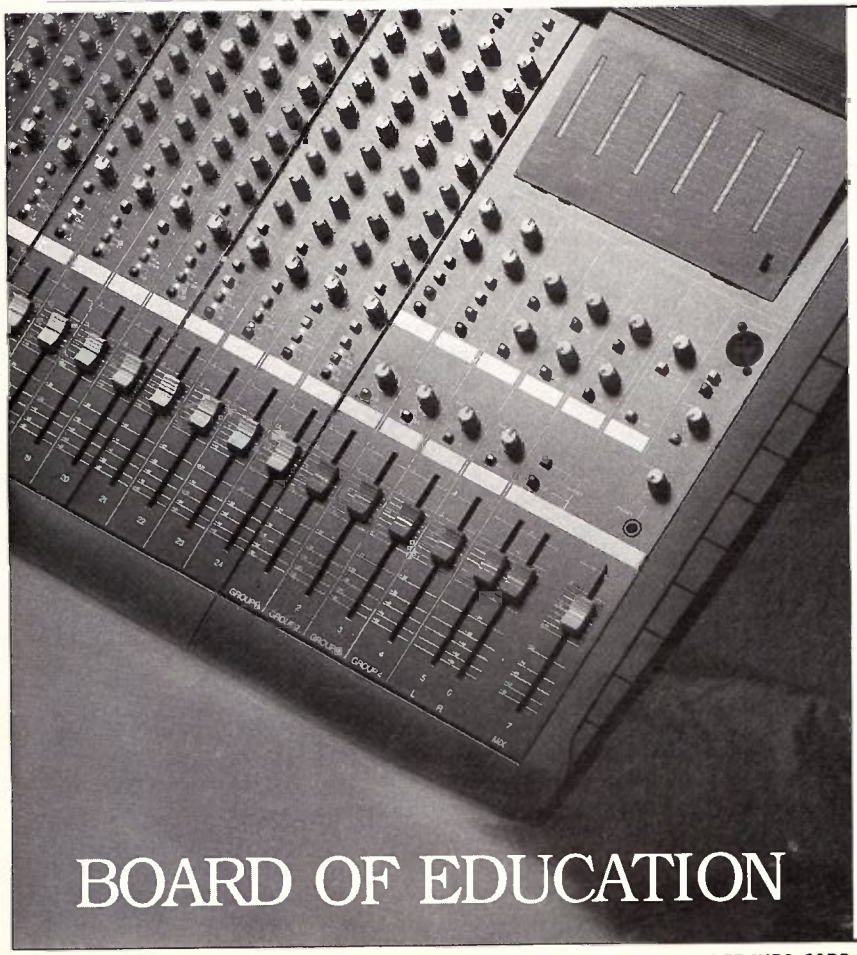
back to a patch panel. The use of the sub-D connector precludes the use of standard audio cables when connecting multiple HPA-100's. The sub-D connector offers quick connection of 10+ audio channels and, with a little thought, makes this unit a powerful system for meeting the needs of the performer in even very complex audio systems.

Custom 25-pin sub-D connecting cables are available from Langevin. Custom-order versions of the mixer, with the mix output brought out to 1/4-inch phone jacks, may be available in the future. The unusual daisy-chain connectors reserve the unit's more sophisticated capabilities for long-term applications. A ground-lift switch would have been convenient for last minute use in a recording session or live performance.

The Langevin HPA-100 is an excellent sounding line-level mixer. The sound of even the most delicate instruments will reach the headphones of the most demanding musician. This little mixer has a very low noise floor, robust construction, and very easy-to-use controls with a nice operational feel.

REVIEW: PERTEK MONITORMATE

The MonitorMate is a compact unit built to mount directly onto a mic stand. This provides musicians with handy access to the balance of their instrument or voice and overall band mix. The MonitorMate gives musicians, using a pair of headphones or a monitor loudspeaker the freedom to make changes in their monitor mix without affecting the



Phonic's M-Series four-bus mixing consoles are not high-school dropouts masquerading as college grads. Available in 24- and 16-channel versions with sub groups and master output, these production-quality boards are engineered to deliver clean, quiet mixing performance at a price that won't require a student loan.

For enhanced mixing control and added flexibility, all input channels feature six aux sends assignable to pre and post fader positions, 3-band semi-parametric EQ with sweepable mids and easy insertion of outboard effects on input channels, sub groups and master outputs.

There just isn't enough room in this ad to educate you on all the exciting features and functions found on Phonic's M-2442 and M-1642. For a real education, check them out at a professional audio retailer near you.

ARTICULATE SOUND
PHONIC®
1632 McGraw Ave., Irvine, CA 92714 (714) 253-4000

CIRCLE 49 ON FREE INFO CARD

World Radio History

all the power of the DP/4 ... plus

- ¼" Balanced TRS Inputs/Outputs
- Seamless Switching of Effects
- New Guitar Effects
- Built-In Guitar Tuner
- Combination XLR/¼" Front Panel Input
- Vocal "Remover" Algorithm
- Headphone Jack with Output Mute
- LED Indicators to Show Configuration
- +4/-10 Switch

introducing the new DP/4+

The DP/4. You've heard about it from the many rave reviews it received around the world. Or any number of top studios and engineers who have used it on hit records, soundtracks, and commercials.

It offered an unheard-of 4 inputs and 4 outputs, with 4 independent high-quality effect processors. Able to process from 1 to 4 different signals with true stereo output. All with a rich sound, and effects covering everything from mixdown, to live sound, to your guitar.

How could we hope to top that? Simple. We listened. To reviewers, top artists, studios, and your comments. The result? The new DP/4+.

Along with the great sound and features of the original, the new DP/4+ will integrate into your studio *(home or pro)* with better signal matching and ease-of-use. If you're a guitar player you'll appreciate our improved effects switching and new amp simulations. As well as the built-in tuner and headphone jack.

Introduce yourself to the power of the DP/4+. And thanks for the input!

For more information or the dealer nearest you, call 1-800-553-5151. Or, try our automated fax retrieval system at 1-800-257-1439.

CIRCLE 27 ON FREE INFO CARD

ENSONIQ
LEADING THE WORLD IN SOUND INNOVATION

☐ Send me more information on the DP/4+.

Also send info on:

☐ TS Series *synths* ☐ ASR-10 *samplers*
☐ SQ Series *synths* ☐ KS-32 *weighted action synth*
☐ KT Series *64 voice weighted action synths*

☐ I'd also like your *make music* **think ENSONIQ** demo CD *(enclosed is $5.00 for shipping and handling).*

Name _____

Address _____

City _____ *State* _____ *Zip* _____

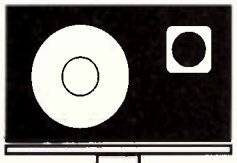
Phone (_____) _____

Mail to: ENSONIQ, Dept. Q-53, 155 Great Valley Parkway, P.O. Box 3035 Malvern, PA 19355-0735 (610) 647-3930 *voice* (610) 647-8908 *fax*

World Radio History

Introducing
Max Speaker Stands™

Specifically designed for critical monitoring applications!



Isolated vibration absorbing monitoring platforms. Speakers achieve better definition without the problem of console resonance or buzz.

All overdone welded steel construction.

Sand fillable for maximum isolation.

Spike feet for minimum sound/vibration transmission.

40 inches tall with 3 adjustable feet for easy leveling. 12 X 12 foot print & platform.

Accomodates most popular near-fields.

Mid-field stands & Mains stands, all with the same heavy duty construction and elegant finish.

Satisfaction Guaranteed! Return them within 30 days for a no questions asked refund.

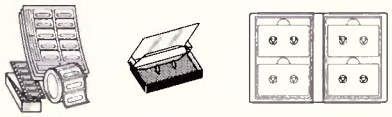
$299.99
Cod Visa/MC or Pro-Audio Dealers everywhere.
305.669.1330
Fax 669.1279
Dealers inquires welcome.

CIRCLE 47 ON FREE INFO CARD

professional
Audio Supplies
immediate shipment

QAR1/6b

AMPEX BASF maxell TDK 3M



labels cassette boxes albums

CD packaging reels and boxes

ask for our free PolyQuick catalog

Chicago
(708) 390-7744 Fax: 390-9886
Los Angeles
(818) 969-8555 Fax: 969-2267

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

CIRCLE 51 ON FREE INFO CARD

mix in anyone else's monitor.

The unit offers control over the microphone and line mix (with bass and treble controls) to the headphone and loudspeaker outputs. I have never cared for 3.5 mm headphone jacks, especially when adapting to a standard 1/4-inch headphone plug, but perhaps the dense array of controls (five knobs and three switches — see the spec sidebar) on the top panel of the MonitorMate demand it. With the exception of the headphone output, all connections are on the bottom of the unit to keep the cables from interfering with those top-panel controls when mounted on a mic, keyboard, or drum stand. Three sizes of clips are available to snap the unit to a variety of tubular stands. The MonitorMate has an internal power supply with a captive AC power cord.

Internal construction is basic but obviously focused on preventing the unit from failing due to the inevitable drops and knocks that can be expected in this application. The use of unguarded toggle switches is, however, the weak point in the otherwise rugged construction. The 15-watt power amplifier is handy when using miniature stand-mounted monitor loudspeakers. The MonitorMate is a very self-contained package for a range of monitor and even minipowered mixer applications.

REVIEW: GOLD LINE MS3

Gold Line is a small but innovative company that has been successful at seeing a need in the audio workplace and filling that need with a cost-effective product. The Gold Line Multi/Send Personal Mix System is an unconventional mixer suited to any application where you need to create specific submixes of a few audio channels without interrupting the signal's flow to other mixers.

Simply put, the MS3 is a three-into-two (or one) mixer. Each input is connected to the front panel and a parallel (direct connection between connectors) of that signal is available on a connector on the rear panel. The inputs simply flow through the unit, untouched, and the signal is bridged (at high-impedance so no loading occurs) allowing the user to create an independent mix of the signals on the MS3.

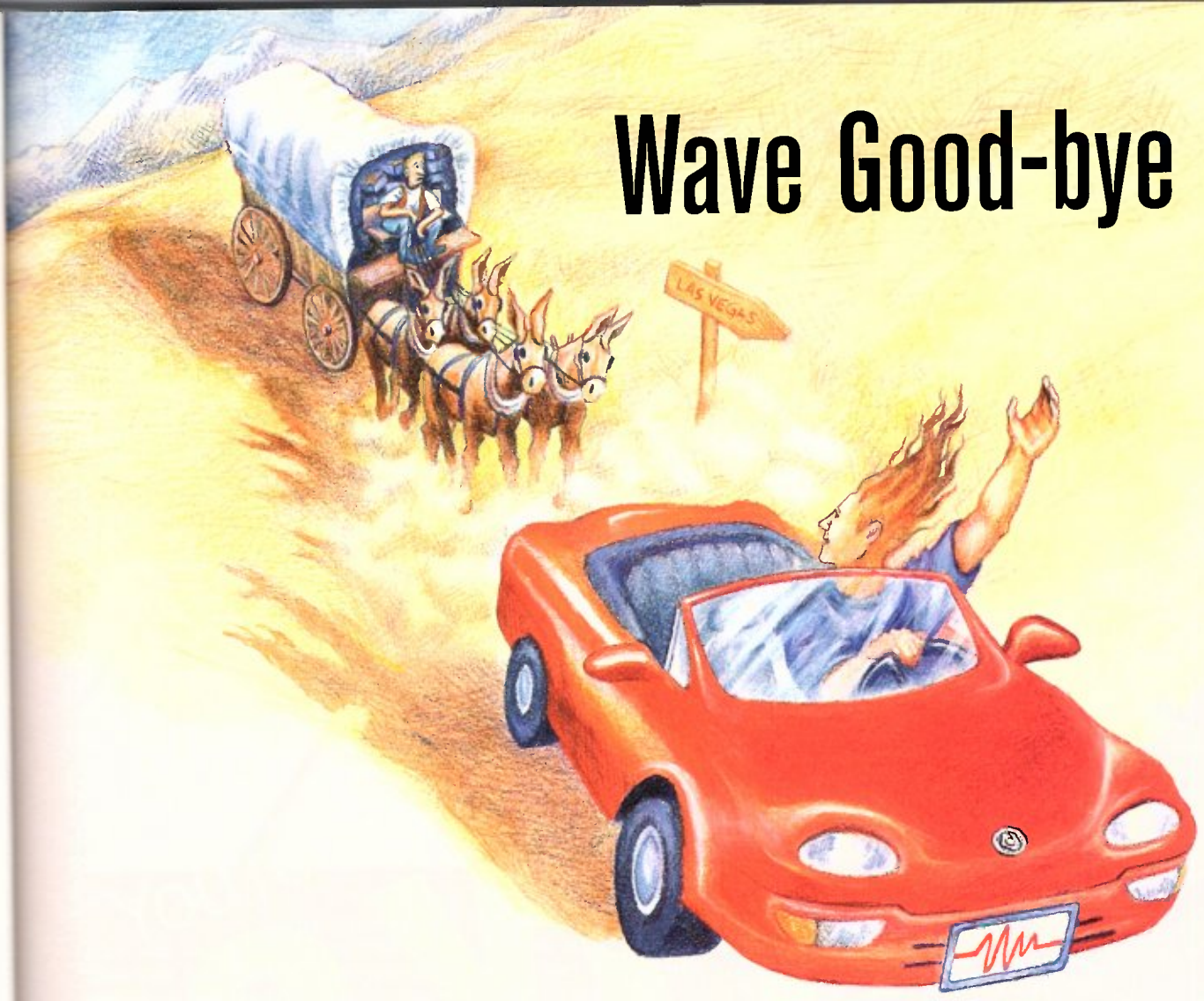
The unit is powered from a wall-wart-type power supply that, at least on the review unit, lacked sufficient regulation, causing hum to be audible in the mixed outputs [*Gold Line notes that the power supply has been replaced with a quiet unit*]. Signal-to-noise could also be improved a little, as hiss was audible on 600-ohm headphones regardless of input level gain setting.

Recessed controls, clean internal construction, and solid steel case make the MS3 tough enough to take a numerous falls to the studio floor. This versatile and unique mixer is the type of device that could save many of us from those times when we need to add just one more auxiliary send to our big mixers. The MS3 could even be powered by batteries if things were to get out of hand. EQ

GOLD LINE MULTI/SEND PERSONAL MIX SYSTEM

Manufacturer: Gold Line, Box 500, West Redding, CT 06896. Tel: 203-938-2588
Input 1 & 2: balanced line level XLR and 1/4-inch phone jack; switchable mono or stereo; two independent level controls
Input 3: balanced XLR ; switchable mic or line level; mix level control
Power Input: 3.5 mm jack; 12 volt DC from AC adapter or battery supply; power on LED indicator
Level Input: signal presence LEDs on each input
Output 1 & 2: 1/4-inch phone jack; balanced line level; parallel of inputs unaffected by mixer controls
Output 3: balanced XLR ; parallel of input unaffected by mixer controls
Mix Input: balanced 1/4-inch phone jack; line level output
Headphone Input: 1/4-inch phone jacks; separate 600 ohm and 8 ohm outputs
List Price: $349.95
EQ Free Lit. #: 122

World Radio History



Wave good-bye to aggravating and time consuming sound editing. Say hello to Sound Forge 3.0, the most comprehensive digital sound editor for Windows.™

Sound Designers now have the means to push, pull, stretch, distort, correct, analyze, and generate sounds like never before. The effects and processing features are unmatched for flexibility and sound quality. Previewing and custom definable presets make Sound Forge a perfect companion for the serious Sound Designer.

Musicians will welcome the ability to run Sound Forge and MIDI sequencers simultaneously on a single computer. Sound Forge outputs stable MIDI Time Code (MTC) in all standard frame rates allowing sequencers to sync exactly to your digital recordings. Regions are triggerable via MIDI notes or MTC. The included Virtual MIDI Router (VMR) makes it possible for MIDI applications and Sound Forge to communicate without requiring extra MIDI hardware. Create perfect samples effortlessly using the real-time loop tuner. Transfer samples to samplers via MIDI SDS or SCSI/SMDI and audition samples directly from Sound Forge with the pop-up MIDI Keyboard. It's all there. Whether you own a Kurzweil K2000, Akai S1000, Digidesign SampleCell II PC, Peavey SP/SX, etc., Sound Forge is the premier front end for sampling workstations.

Pull into the fast lane and call Sonic Foundry at 1-800-57 SONIC (577-6642)

SONIC FOUNDRY

100 South Baldwin, Suite 204, Madison, WI 53703, Tel: (608) 256 3133 Fax: (608) 256 7300, CompuServe: 74774,1340 or GO SONIC, Internet: sales@sfoundry.com

System Requirements: 4 MB RAM, Windows 3.1 or higher, VGA graphics, Hard disk, and a Windows compatible sound card. Sound Forge and Sonic Foundry are trademarks of Sonic Foundry, Inc. Other products mentioned are trademarks of their respective manufacturers.

CIRCLE 59 ON FREE INFO CARD

World Radio History

It Takes Two (Tracks)

Learn how to do the lost art of 2-track recording

BY BRUCE BARTLETT
WITH JENNY BARTLETT

Before the mid-'60s, all recordings were mixed live to stereo or mono. Many of them sounded fantastic. These days we record everything on multitrack, but we ought to rediscover the art of 2-track recording. Why? The sound can be much more transparent and punchy.

If you mix directly to 2-track, the signal goes through your mixer only once — during recording — not twice during recording and mixdown. There's only one tape generation. The signal path is as short as possible, so the sound is extra clean and clear. What's more, you save recording time because you omit the overdubs and mixdown.

Recording live to 2-track is exhilarating. The band you record has to perform well all the way through the song, so they must be well rehearsed. And you have to do a flawless mix as the band plays. All the musicians must play or sing at the same time; you can't overdub. But this can be a blessing in disguise. Musicians often play better when they can interact and feed off each other's energy.

2-TRACK RECORDERS

Assuming you want to try some 2-tracking, what type of recorder should you use? Three options are the analog tape recorder, DAT, and VHS Hi-Fi. Analog tape tends to sound "warm," meaning that it bumps up the lows a little and sounds sweet and open on cymbals. Analog tape compresses the signal at high levels.

Compared to an analog tape deck, a DAT recorder sounds cleaner. DAT has flatter response and much less hiss, distortion, and flutter, but cymbals tend to sound a little more harsh or confined with a DAT. Outboard A/D converters can reduce the harshness (see the sidebar for more details). Since a DAT can record two hours nonstop, it's ideal for taping concerts.

VHS Hi-Fi costs the least yet sounds almost as good as digital. You need a VCR that lets you adjust the recording level manually.

The three recorders use different styles of editing. You edit analog tape with a razor blade and splicing tape. You can't do that with a DAT tape. Instead, you copy from one DAT to another, or use a computer sound-editing program. The VHS Hi-Fi transport is too imprecise to edit by copying from one deck to another, but you can edit the recording on your computer.

2-TRACK RECORDING STYLES

Three ways to record to 2-track are with stereo miking, multimiking, and sequencing.

With stereo miking, you record a musical ensemble with a stereo mic or a matched pair of mics. You pick up the group as a whole, along with the room acoustics. This method works best for an orchestra, symphonic band, choir, pipe organ, string quartet, or soloist. Stereo miking sounds muddy when used to record a rock band, but it can work with a folk or acoustic jazz group.

With multimiking, you mic each instrument and singer and mix them live to 2-track. This method works best with rock, pop, folk or jazz.

With sequencing, you record MIDI instruments using a sequencer. Mix the audio outputs of the MIDI instruments though a mixer. Hit Play on the sequencer and record the mixer output. You can mix in a vocal or sax solo as you record the MIDI instruments to 2-track.

CONNECTIONS

Connections for 2-track recording are simple. If you're stereo miking, either plug the mics directly into the recorder's mic inputs or into a mic preamp. Plug the mic preamp outs into your recorder's line ins. Outboard mic preamps, or good mixer mic preamps, tend to sound cleaner than the low-cost preamps built into recorders.

If you're sequencing or multimiking, plug your mixer's bus 1 and 2 outputs into your recorder's line inputs. If you're grouping inputs on your mixer, plug the stereo bus out to recorder line in. The sound will be cleaner if you don't set up groups, so try to mix everything directly to busses 1 and 2.

World Radio History

a folk or

mic each
nix them
orks best

record
quencer.
he MIDI
Hit Play
the mixer
al or sax
I instru-

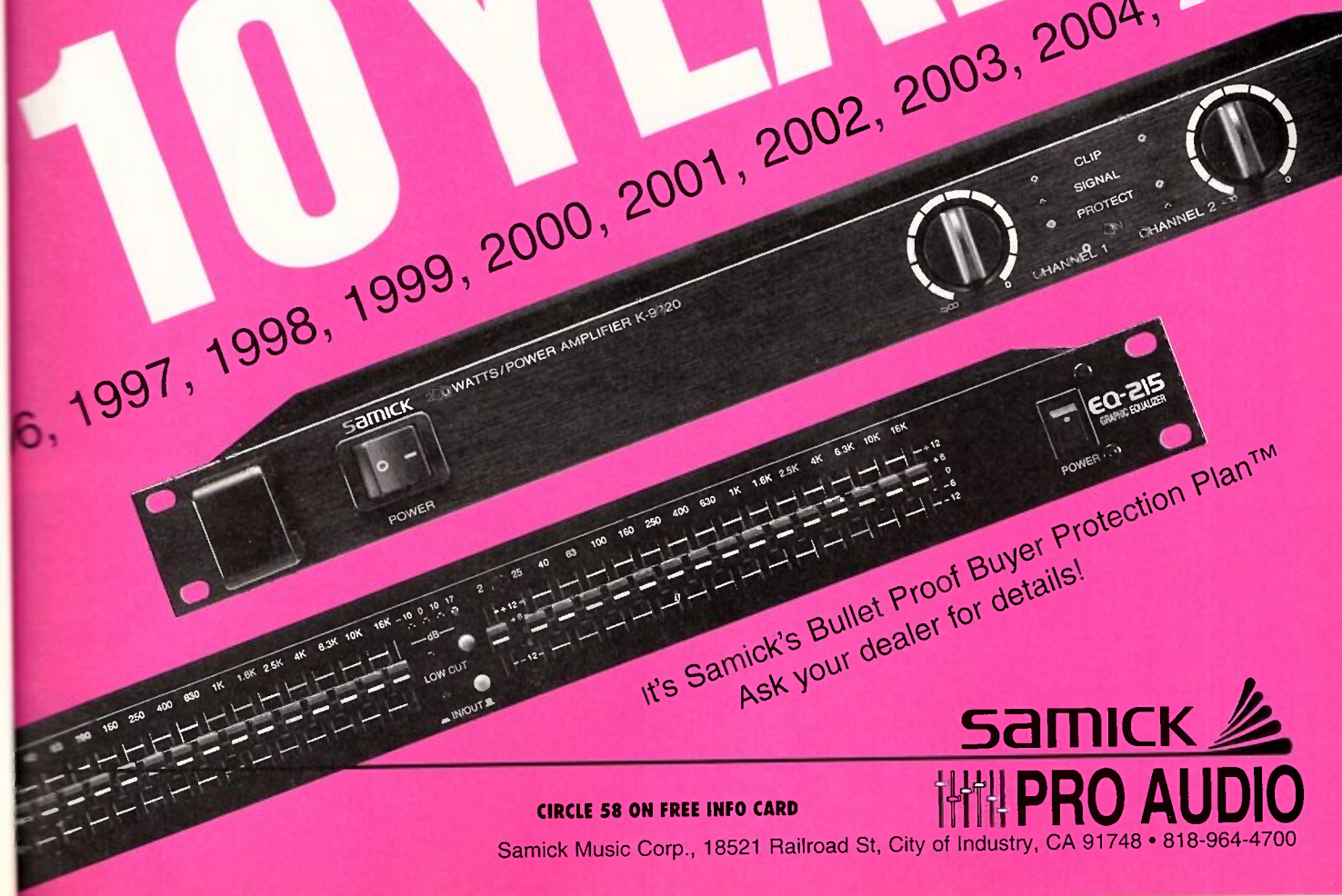
rding are
ng, either
into the
to a mic
mp outs
ns. Out-
od mixer
d cleaner
built into

multimik-
nd 2 out-
inputs. If
ur mixer,
order line
er if you
y to mix
1 and 2.

You're Protected For

10YEARS!

6, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005



It's Samick's Bullet Proof Buyer Protection Plan™
Ask your dealer for details!

samick
PRO AUDIO

CIRCLE 58 ON FREE INFO CARD

Samick Music Corp., 18521 Railroad St, City of Industry, CA 91748 • 818-964-4700

World Radio History

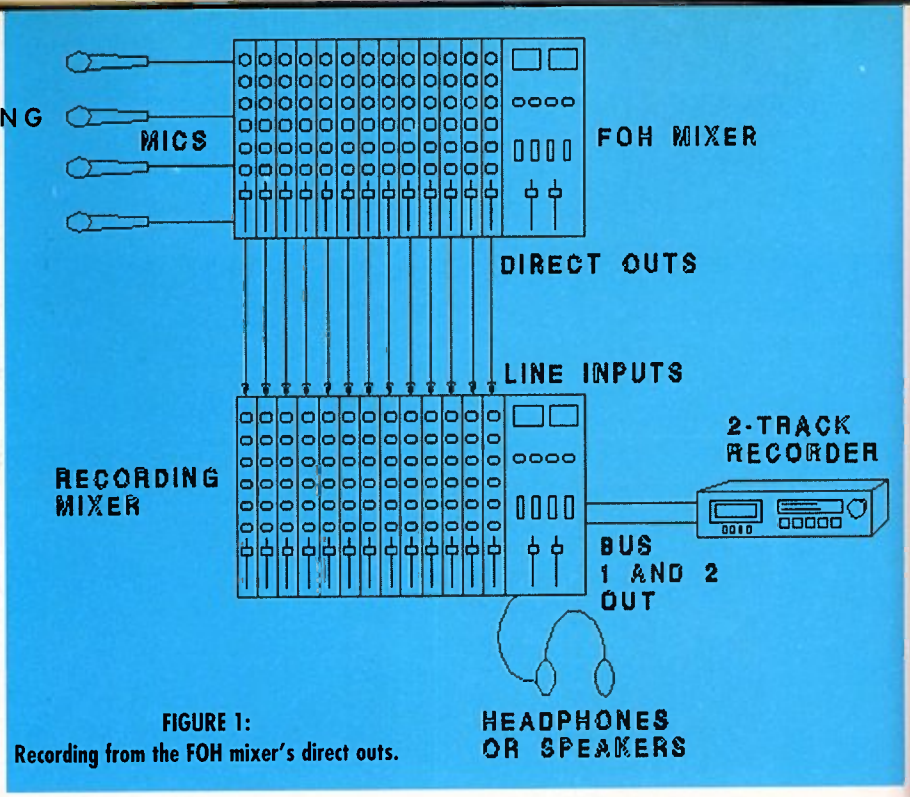


FIGURE 1:
Recording from the FOH mixer's direct outs.

MULTIMIKING PROCEDURE

Here are some techniques for multimiking a band and recording it live to 2-track. First set up to monitor busses 1 and 2. It's hard to monitor clearly over headphones because the band's live sound leaks through the 'phones ear seal. Try to use a snake so you can monitor in a separate room. If you must be in the same room as the musicians, use headphones with good isolation, such as Etymotic earphones.

When recording a concert, don't record the mix off the FOH board. The FOH mix is meant to augment the live sound of the band and monitors, not to sound good by itself. Instead, connect the direct outs from the FOH mic channels to the line inputs of a separate recording mixer (fig. 1). Or split the mics to feed the FOH mixer and your recording mixer (fig. 2).

Mic each instrument and singer, making sure all your mics are the same polarity. You can reduce leakage by miking close and recording direct. Have vocalists sing with lips touching the foam pop filters on their microphones. Use direct boxes or guitar amp simulators instead of mics. Direct boxes give a clean, tight sound since they pick up no background noise or leakage. In the studio, don't use a bass amp; record the bass guitar direct and monitor it with headphones instead. This keeps the muddy-sounding bass notes from bouncing around the room.

What if you don't have enough mics? Try miking the drum set with one mini omni mic, about 4 inches above the snare rim in the middle of

SOUNDBURST.

Get a Warehouse of Tube Amp Rigs in a Single Rackspace... with SansAmp PSA-1.

TECH 21·NYC

SansAmp™ Model PSA-1. Manufactured in the U.S.A. by Tech 21, Inc. 1600 Broadway, NY, NY 10019 • 212-315-1116 • Fax: 212-315-082

CIRCLE 76 ON FREE INFO CARD

World Radio History

Upgrade all your microphones

Smooth and intimate, dimensional and detailed...is that the sound you're looking for? The Aphex 107 Tubessence® Thermionic Microphone Preamplifier reveals the subtlety and power in both vintage condensers and popular dynamic mics. Qualities that are lost on your console's mic preamp. **Tubessence, for the long journey from microphone to CD.**

The Aphex Model 107, tube mic pre - two channels of Tubessence for $595.00 MSRP (U.S.). Call or fax for a dealer near you.

APHEX SYSTEMS

Improving the way the world soundsSM

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

CIRCLE 08 ON FREE INFO CARD

World Radio History

PUT YOUR HEAD WHERE YOUR HEART IS...

Come to New York City

the center of the recording industry. Learn recording engineering at the

INSTITUTE OF AUDIO RESEARCH

Our 9 month Recording Engineering and Production Program includes: Multitrack Recording, Mixdown Techniques, MIDI, Digital Audio & more. + a diploma from a world renowned school.

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

Your focus is music, our focus is you.

INSTITUTE OF AUDIO RESEARCH
64 University Place
New York, NY 10003

CIRCLE 44 ON FREE INFO CARD

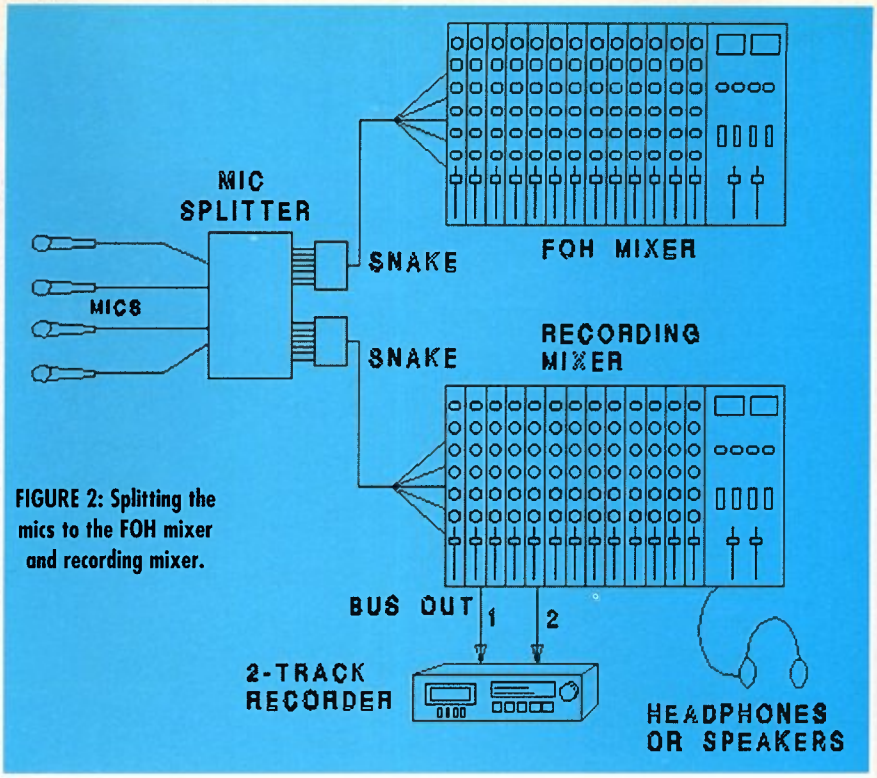


FIGURE 2: Splitting the mics to the FOH mixer and recording mixer.

the set. Boost the bass and treble a little. Another mic goes in the kick. If necessary, you can pick up two instruments with one mic.

Now set the master faders to design center (0 dB, about 3/4 up). While listening to the mixer output, bring up the bass player's fader and ask him or her to play. On the mixer, set the bass gain-trim pot to prevent input overload. Listen carefully to check for hum, noise, and buzzes. Repeat these steps for each instrument and vocal. The lead vocal might need a compressor; patch it into the vocal channel's access jacks.

Next, have the musicians play the tune while you set up a mix. You might start by raising all the faders to about –15 dB. Pan each mic as desired. Then adjust the faders so you can hear everyone about equally. Make sure you can hear each instrument in the mix.

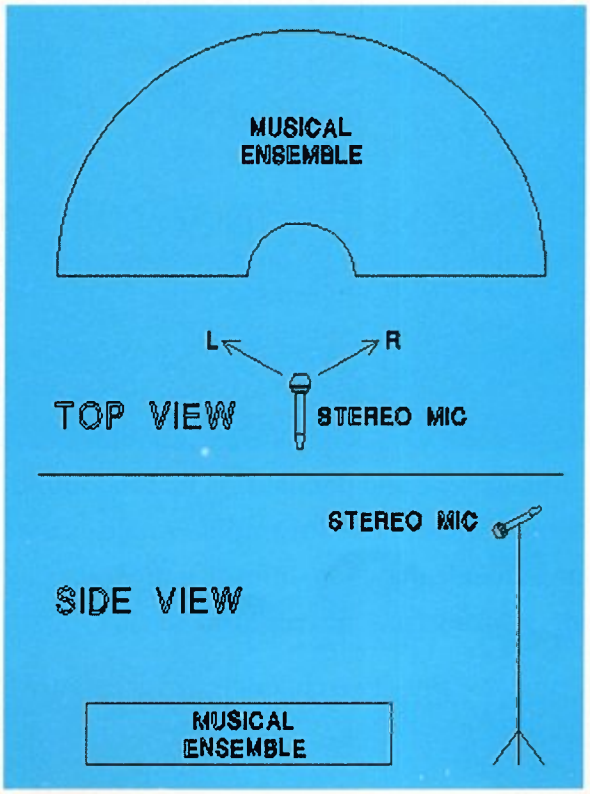


FIGURE 3: Stereo miking for 2-track recording.

With the balances roughed in, tweak up EQ. Close-miked vocals will need some bass rolloff to sound natural, about –6 dB at 100 Hz. You might have to turn up the monitors or headphones to hear the mix better. When the band stops, do a quiet playback so you can check your EQ settings at home-stereo levels.

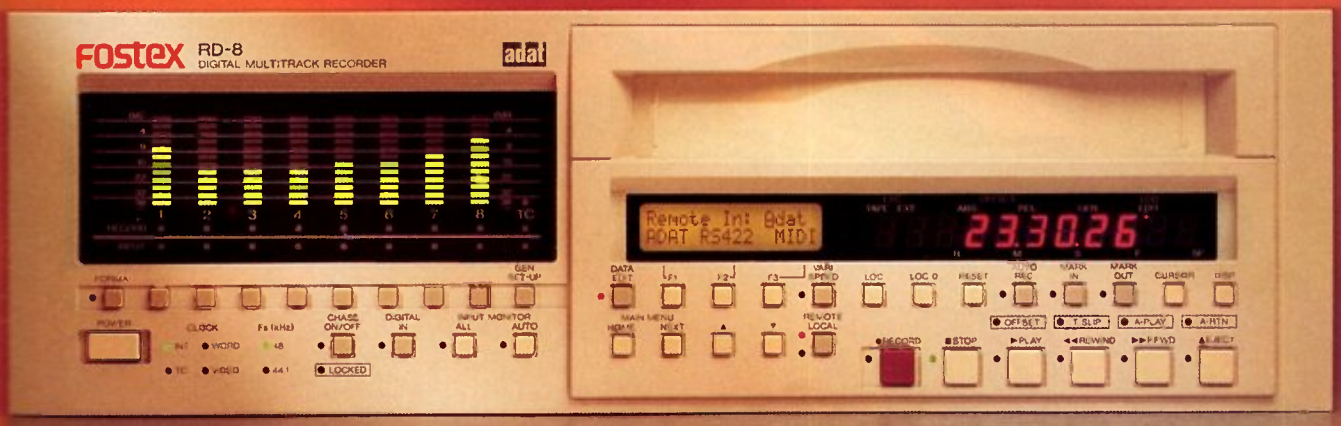
Keep the mixer level peaking around 0 maximum. Set your recorder's input level so its meters peak at +3 max (if analog) or –3 max (if digital) [check the specific owner's manual]. Finally, add effects.

Once you're happy with the mix, record about a minute of the tune. Then play it back.

continued on page 120

World Radio History

The RD-8. Now Performing At A Project Studio Near You.



Audio for Video Projects

Chris Taylor–Crossroads Studios

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

Post Production Projects

Brando Triantafillou–Editel, Chicago

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

MIDI Projects

Frank Becker–Frank Becker Music

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

Location Projects

Paul Freeman–Audio by the Bay

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

Composing Projects

Christopher Hoag–Composer

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

The RD-8 Digital Multitrack Recorder

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

FOSTEX

CIRCLE 90 ON FREE INFO CARD

World Radio History

MAST

E

T

V

IN THE PRO

World Radio History

TERING

EQ PRESENTS

THE WHO'S,

WHERE'S,

WHAT'S,

AND

WHY-THE-HECK-
YOU-NEED-IT'S

ROJECT STUDIO

World Radio History

What You Should Know About Mastering But Tend To Forget

MASTERING SHOULD BE A PART OF YOUR STUDIO LIFE. HERE'S WHY.

By Bobby Owsinski

The process of mastering is one of those things in life that we kind of take for granted. We know that it has to get done in order to complete the project that we've just worked so hard on, but we don't always take advantage of the many creative possibilities available to us. Instead we just leave it up to the mastering facility, or worse yet, bypass the mastering facility completely and blindly let the job get done by the duplicator. Well, it's time to jog the old memory banks as to the how's and why's of mastering so we can take full advantage of the mastering process and hopefully save some time and money along the way. Don't feel bad if you've forgotten (or even never knew) some of the following points, since our minds are so inundated with bits and bytes these days that it's easy to overlook such a seemingly mundane process.

What Is Mastering?

Mastering is the process of transferring the electronic impressions recorded on tape to a different medium. Not so long ago, this transfer went to the mechanical medium of vinyl (actually a softer version called cellulose nitrate, a distant cousin of nitro glycerin). Nowadays, we "prepare" for the transfer to compact disc and cassette. In the early days of vinyl, mastering was a black art practiced by technical curmudgeons who mysteriously made this transfer. There was a high degree of difficulty in this because the level applied to the vinyl lacquer was so crucial; too low a level and you get a noisy disc, hit it too hard and you destroy the disc and maybe the cutting stylus too. Along the way, mastering (sometimes called "transfer") engineers found ways to make the discs louder (and therefore less noisy) by applying equalization and compression. Producers and artists began to take notice that certain records would actually sound louder on the radio, and if it played louder then it sounded better and possibly even sold better. Hence, a new breed of mastering engineer was born, this one with some creative control and ability to influence the final sound of a record rather than just being a transfer jock from medium to medium.

Today's mastering engineer practices less of the black art of disc cutting but is no less the wizard as he or she continues to subtlety shape and mold the variations of frequencies and dynamics of a project.

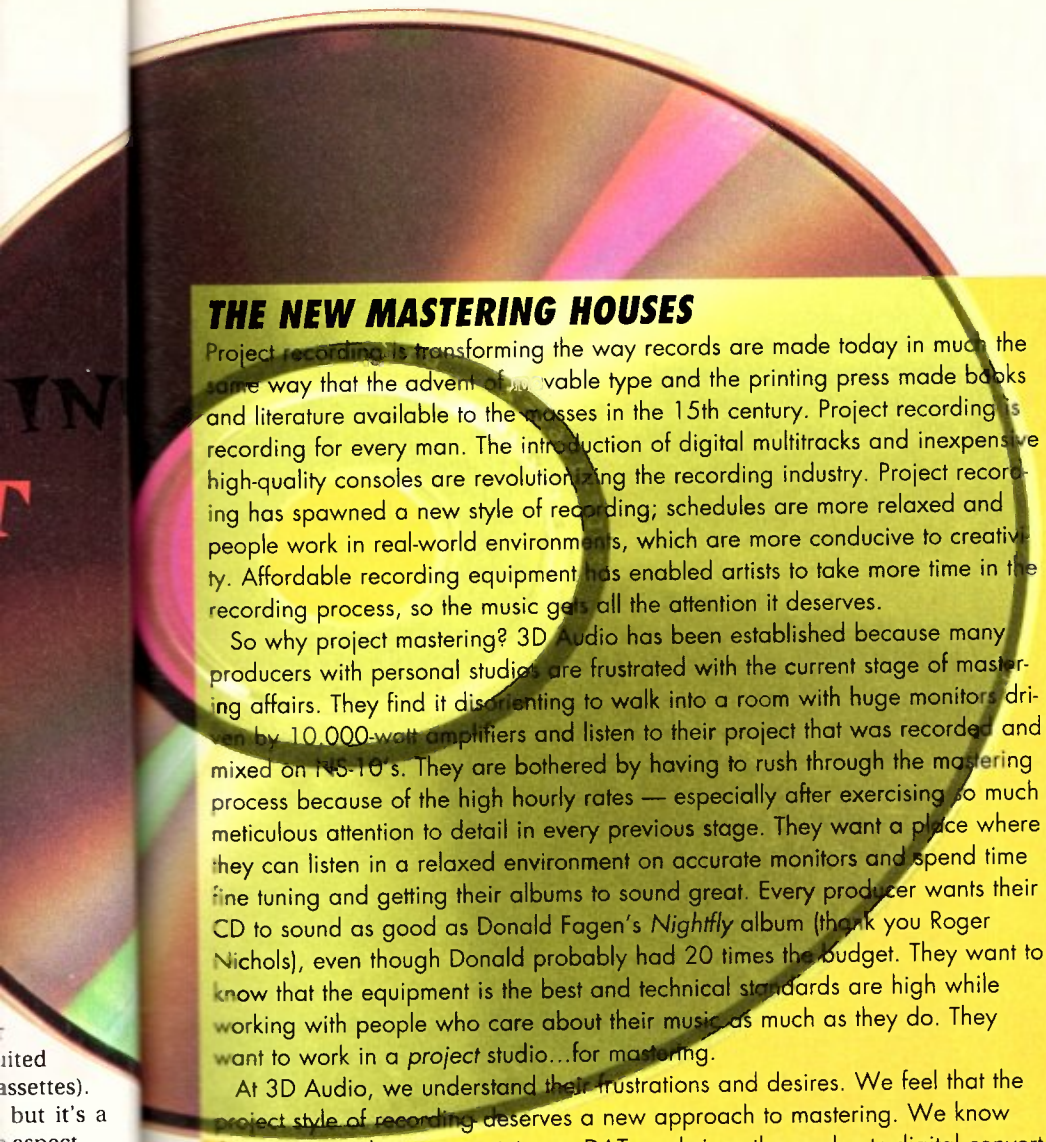
Why Do I Have To Master?

Mastering should be considered the final step in the creative process, since this is our last chance to polish and fix our project. This is the case in the United States, but in Europe mastering is looked upon as the first stage of the manufacturing process since this is where the electronic impressions on tape get transferred to either a mechanical medium (such as vinyl) or another electronic medium better suited for mass production (like cassettes). Both of these views are true, but it's a shame to overlook the creative aspect.

A project that has been mastered at a top-flight mastering house simply sounds better. It sounds complete, polished, and finished. The project that sounded like a demo now sounds like a "record." This is because the mastering engineer has added judicious amounts of EQ and compression to make your project bigger, fatter, richer, and louder. He has also taken your mix master and transferred it to either Sony 1630 3/4-inch U-matic format (the standard format expected by the duplicating facility) or CD-R recordable CD, which is quickly becoming the new standard because of its lower cost and inherently lower error count.

Going back to the creative aspects for a second, it's even a good idea to master a project even if it's only a songwriting demo and not intended to ever be released. I know many producers, artists, and songwriters who will buy an hour or so of mastering time just to get the benefit of making their demos sound more polished before they shop them around. Also, when

World Radio History



THE NEW MASTERING HOUSES

Project recording is transforming the way records are made today in much the same way that the advent of movable type and the printing press made books and literature available to the masses in the 15th century. Project recording is recording for every man. The introduction of digital multitracks and inexpensive high-quality consoles are revolutionizing the recording industry. Project recording has spawned a new style of recording; schedules are more relaxed and people work in real-world environments, which are more conducive to creativity. Affordable recording equipment has enabled artists to take more time in the recording process, so the music gets all the attention it deserves.

So why project mastering? 3D Audio has been established because many producers with personal studios are frustrated with the current stage of mastering affairs. They find it disorienting to walk into a room with huge monitors driven by 10,000-watt amplifiers and listen to their project that was recorded and mixed on NS-10's. They are bothered by having to rush through the mastering process because of the high hourly rates — especially after exercising so much meticulous attention to detail in every previous stage. They want a place where they can listen in a relaxed environment on accurate monitors and spend time fine tuning and getting their albums to sound great. Every producer wants their CD to sound as good as Donald Fagen's *Nightfly* album (thank you Roger Nichols), even though Donald probably had 20 times the budget. They want to know that the equipment is the best and technical standards are high while working with people who care about their music as much as they do. They want to work in a *project* studio...for mastering.

At 3D Audio, we understand their frustrations and desires. We feel that the project style of recording deserves a new approach to mastering. We know that many producers are mixing to DAT, and since the analog-to-digital converters in DAT recorders are typically the weakest link in the mixing chain, most listeners outside the mix session never fully realize the sonic potential of the original recording. We supply producers and engineers with the finest A/D converters available, the Mytek AD 2018, for their final mixdown. This enables them to make sure the music they have slaved over doesn't get lost on the jump to the digital domain. Many albums these days are cut and mixed on nearfield monitors, yet everyone wants their mixes to translate well to the real world. We make that happen. Not everyone mixes with automation and sometimes problems or noises slip through that can't be fixed in the mixing studio. We fix them. Not everyone can afford to cut their vocals on an AKG C-12 through a Massenburg preamp into a Pultec EQ and a Fairchild limiter, but we know that most people want it to sound like they did.

We appreciate that producers want sonic and technical excellence, so we use the finest digital signal processing available, including t.c. electronics M5000 with Mastering Dynamics software, Apple PowerPC and Quadra computers, and editing software from Digidesign (Sound Designer II), Opcode (StudioVision Pro), and OSC's Deck 2,2 (which we beta-tested). We know producers prefer to master their projects in an environment that is familiar and comfortable to them, so we even offer mobile mastering. We can do all the digital editing and mastering by bringing our entire setup to a producer's studio. We understand that a producer/musician, like everyone else, is looking for people who will work with them and help them realize their best self and accomplish

continued on page 122

PRICE+QUALITY+ SELECTION=

FULL COMPASS

SHURE beyerdynamic SONY AKG Fostex ATARI dbx Nakamichi lexicon MACKIE. RANE KRK Studiomaster Drawmer Symetrix RAMSA SOUNDTRACS audio-technica APHEX SYSTEMS marantz MTX DENON ART 3M CLONE TONE lowell BASF CARVER apollo Ampex ETA QSC Vega Ness Zoom Altman AKAI NEUTRIK crown TASCAM SENNHEISER Panasonic GE Technics

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

FULL COMPASS
5618 Odana Road, Madison, WI

CIRCLE 36 ON FREE INFO CARD

World Radio History

using a studio for the first time, many producers and engineers will also take a rough mix to their favorite mastering house just to make sure of what they're hearing. In fact, many top-of-the-line facilities don't even charge their better customers for this service.

Mastering Tips To Remember

1. Don't over-EQ when mixing. Better to be a bit dull and let your mastering engineer brighten things up. In general, mastering engineers have an easier time of it and can do a better job for you if you are on the dull side rather than the bright side.

2. Make sure you print tones. For analog, these should be done before mixdown on the same machine that you mix on rather than after the fact. Don't fudge these tones either. The mastering engineer couldn't care less if you had a perfect alignment or were 2 dB down on the left channel. All he wants to do is set up his playback machine to be a mirror image of your recorder so it plays back exactly the same. You must print 30 seconds or so of 1 kHz for channel balance, 10 kHz for azimuth adjust, and 50 Hz for low frequency compensation. The last frequency is particularly important. The oscillator on many older consoles can only output 100 Hz, but this is usually way higher than the head bump of the recorder and any small adjustment at this frequency will mean a huge adjustment in the head bump area. So 50 Hz will provide a far more accurate alignment. Also, print any Dolby alignment tones if Dolby was used.

For digital formats (such as DAT), a 1 kHz tone at anywhere from –8 to –15 dB (there is no standard as of yet) can be printed, but is not absolutely necessary since digital 0 is actually the same from machine to machine.

3. Documentation. The documentation expected includes any tape flaws, digital errors, distortions, bad edits, fades, shipping instructions, and matrix (record company identification) numbers. Don't be afraid to put down any glitches, channel imbalances, or distortions. The mastering engineer won't think less of you if something got away (you wouldn't believe the number of times it happens to everybody), and it's a whole lot easier than wasting a billable hour trying to track down an equipment problem when the problem is actually on the tape itself.

4. Check your phase when mixing. It can be a real shock when you get to the mastering studio and the engineer begins to check for mono compatibility and the lead singer disappears. Even though this was more of a problem in the days of vinyl and AM radio, this is still an important point since many so-called stereo sources (such as television) are either pseudo-stereo or only stereo some of the time. Check it and fix it if necessary before you get there.

5. Be careful when using Dolby. Dolby (A, B, C, S, or SR) can be a godsend or it can be trouble if you're not careful. Don't double encode if you can

CIRCLE 81 ON FREE INFO CARD

World Radio History

GLOBAL WARMING

The Only Analog Tape Saturation Processor For Digital Recording.

While we at RSP Technologies can't take all the blame for recent warming trends, we will accept our share, thanks to our new Saturator™. The world's first product designed to provide tube warmth for digital recording, the Saturator brings the analog tape "saturation" process to the digital domain, warming up digital tracks and putting an end to "brittle" audio. Nothing works like the Saturator's patent pending process to recreate the classic saturation curves of hotter signal level analog recording, while allowing you to retain the benefits of the digital medium. Select the required saturation, from just a hint to soften digital high end, to the massive amounts typical to needle-pinned rock and roll, and yet maintain the clarity and detail of your original digital recording. Get ready to saturate, and don't say we didn't warm you. You'll find the Saturator at your RSP Technologies dealer; it's the store with the bright glow coming from the windows.

RSP Technologies

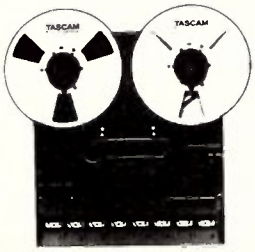
2870 Technology Drive · Rochester Hills, Michigan 48309 · 810 / 853 · 3055

CIRCLE 57 ON FREE INFO CARD

World Radio History

RECORDING EQUIPMENT

—All Major Brands—



FOR STUDIOS/HOMES CHURCHES/CLUBS

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

TASCAM
TEAC Production Products

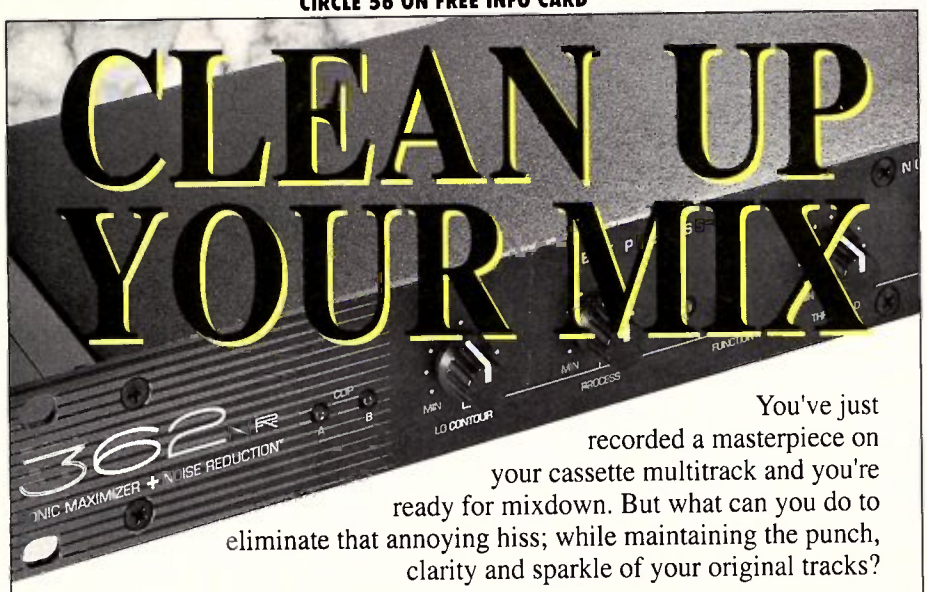
- **VOLUME DEALER**
- NEW & USED
- E-Z TERMS
- ALL MAJOR CREDIT CARDS
- PROFESSIONAL ADVICE

Call for pricing information.

RHYTHM CITY

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

CIRCLE 56 ON FREE INFO CARD



CLEAN UP YOUR MIX

You've just recorded a masterpiece on your cassette multitrack and you're ready for mixdown. But what can you do to eliminate that annoying hiss; while maintaining the punch, clarity and sparkle of your original tracks?

BBE 362NR is the answer

Combining our patented Sonic Maximizer and single-ended noise reduction in one unit allows you to cut hiss, AND, restore high-frequency detail and bass "punch".

BBE Sound Inc.®

Audition one today!
5381 Production Drive • Huntington Beach, CA 92649
FAX 714-896-0736 • 714-897-6766

CIRCLE 17 ON FREE INFO CARD

help it. For instance, don't use Dolby for multitrack recording, then for mixing as well. This can cause some very distinctive phase anomalies that you will hear emphasized in the mastering studio. If you must mix with Dolby (1/2-inch 15 ips with SR is the latest rage and it really does sound good), then it would help if you could bring the original Dolby encoders with you since there are subtle calibration changes that are hard to duplicate from unit to unit.

6. Go to the session if at all possible. Most engineers and producers will go to the first few sessions when checking out a new mastering engineer to see if he has the same musical and technical sensibilities. After that, a bond of trust develops and they will simply send the tape with any instructions. I like to go to all of the mastering sessions if I can because it always sounds different (and probably better) than what it sounded like during mixdown. This allows for some final creative decisions that only you can make.

7. Use caution when using DATs as a master. Make sure you always record at 44.1 kHz when mixing to DAT. The reason being that the CD sample rate is also 44.1 kHz and although 48 kHz might sound marginally better because of the extended frequency response, you'll still have to transcode (convert the sample rate) down to 44.1 kHz for the CD. Because the digital bit stream gets seriously manipulated, it changes the sound somewhat. If you want the sound to remain the same, stick with 44.1 kHz all the time when mixing. Also, don't change sample rates in the middle of a tape since a very loud glitch will usually occur.

Make sure that all songs have ID's written and logged. Ideally, we want to be able to tell the mastering engineer to go to ID 3, 7, 14, etc., for example. Nothing is more unprofessional than when a DAT has no IDs and the producer is unsure which take is the right one.

It's usually best to not record on a DAT master for the first couple of minutes since if any major errors are to occur, this is where they'll be. This is the reason why some manufacturers will have 32-, 62-, 92-, and 122-minute tapes instead of the standard 30, 60, 90, and 120's.

And it goes without saying that you've recorded simultaneously on a second DAT for backup, didn't you?

continued on page 122

World Radio History

The Best Music Equipment Catalog In The Business

FREE

Musician's Friend Gives You...

GREAT VALUE, SERVICE AND SELECTION

- All orders now shipped 2-DAY DELIVERY at no extra charge
- 45-day money-back guarantee
- Toll-free ordering 7 DAYS A WEEK
- Full technical support and customer service
- Customer satisfaction
- Immediate up-to-the-minute inventory and price information
- Major credit cards accepted

MONEY BACK 100% GUARANTEED 45 DAY SATISFACTION

FULL COLOR CATALOG FEATURING...

- Detailed product descriptions
- In-depth reviews of new products
- Informative product articles
- A huge selection of quality brand name equipment including *guitars, basses, amps, keyboards & MIDI, software, effects processors, recording equipment, PA gear, books, videos and tons more...*

Zoom · ART · DigiTech · Ibanez · Marshall · Roland · BOSS · E-MU · DiMarzio · Seymour Duncan Pickups · FURMAN · lexicon · SAMSON · NADY Systems · ESP Custom Guitars · Jackson · Gibson USA · Charvel · DOD · WASHBURN · KORG · EV · Epiphone · FOSTEX · ADA · TASCAM · Fender · ROCKTRON · crown · AKG

CIRCLE 65 ON FREE INFO CARD

For all of your music equipment needs call 1-503-772-5173 and ask for your FREE Catalog

Our Pledge
The best values, shipped to your door

❒ YES! Please rush me the next 3 editions of Musician's Friend totally FREE of charge!

Now's your chance to join hundreds of thousands of satisfied musicians in receiving the #1 catalog, absolutely free!
Call 503-772-5173, or mail in this coupon to Musician's Friend, P.O. Box 4520 • Dept. 114 • Medford, OR 97501.

Name _____

Address _____

City _____ State _____ Zip _____

World Radio History

SOME THOUGHTS ON MASTERING 1995

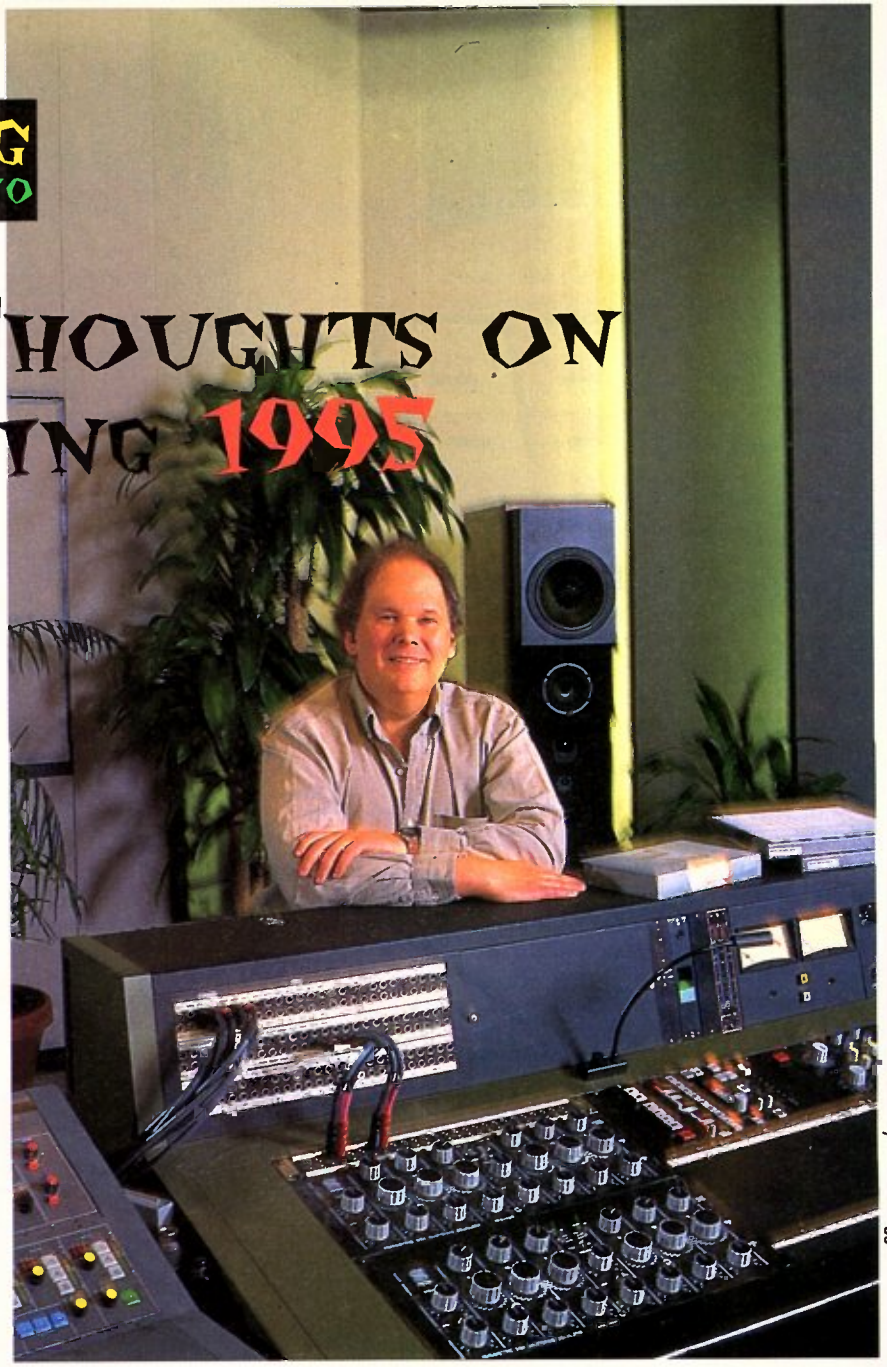


Photo by Dennis Griggs

The mastering process continues to evolve as the technology changes. There are so many different technical options available that many engineers/ producers are confused about how to approach the final stage of their recording project. The mastering sessions of 1995 do not look as they used to even a short while ago. I want to share my thoughts about what new ideas are good, not so good, and what old ideas still work!

ANALOG OR DIGITAL?

In my opinion, the *average* recording we receive to master tends to sound better mixed to analog rather than digital. To me, if you are mixing rock music, there is often nothing better than mixing to a good 1/2-inch Ampex ATR 102. With a great 20-bit analog-to-digital converter (properly re-constructed to 16-bit via an Apogee UV-22, Sony SBM, or Weiss ANR redithering scheme), the best one can say about the sound is that it sounds exactly like the output of the mix console. Of course, this is a great situation! However, many producers say mixing to analog sounds *better* than the console output— it sort of "glues" the sound together. If you are Bob Clearmountain or Hugh Padgham and the sound from the console is, in fact, *exactly* what you want, then digital can certainly be the best format. I usually suggest mixing to both and hearing which sounds best for the particular music.

Make several mixes of the same song, some with the vocal up higher and lower than you think is right. Many times, after the mastering process, the vocal up (or down) may prove to be better than what sounded best premastered.

If you decide to go analog, please write down the *kind* of analog machine you used. Ampex, Studer, Otari, Sony, MCI, etc., do not sound the same. I have four different kinds of analog playback at Gateway Mastering to ensure the tape is being reproduced at its best.

If you decide to go digital, please note what *kind* of DAT machine you used. The automation of the session depends on knowing what kind of code your machine recorded which will then be interpreted by the pro DAT machine timecode reader.

20-BIT RECORDING

Mixing to a proper DAT machine using a good DAT tape is probably the cheapest way to make a decent recording. But hey, it's 1995, and if you are a professional and you want to record digitally, there is no reason why you should not be mixing down with a 20-bit dynamic range. What is your excuse? Sony, Wadia, Prism, Yamaha, Lexicon, and others have been making 20-bit analog-to-digital converters for years and now Apogee is finally ship-

HOW TO KEEP UP WITH THE CHANGING WORLD OF MASTERING

BY BOB LUDWIG

World Radio History

Photo by Dennis Griggs

gital, please
achine you
the session
at kind of
rded which
by the pro
ader.

achine using
robably the
cent record-
if you are a
nt to record
on why you
n with a 20-
hat is your
sm, Yamaha,
been making
onverters for
finally ship-

"For the past ten years, I've used Hafler amplifiers here at Capitol's "Tower Mastering." I'm more than pleased with the sound quality and dependability they provide. The many artists I've mastered know they can rely on our monitors when they're powered by Hafler."

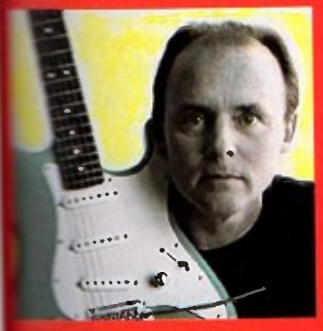
WALLY TRAUGOTT
TOWER MASTERING • CAPITOL RECORDS

"IT'S RIDICULOUS! Excellent bass control, great harmonic detail, the 9505 Trans•nova is another level up in overall performance."

TOM JUNG
DMP RECORDS

"...Once in a while a product comes along that is an incomparable value. Hafler power amps fit squarely into that category: pure abundant transparent power amplification, no gimmicks, and no high price tag. If only all equipment decisions were so easy..."

PAT SCHOLES
DIRECTOR OF ENGINEERING
ARDENT STUDIOS



"I mixed my new album, 'Music From Here' on Hafler. It was an exhilarating experience! While other amplifiers make claims of punch as well as transparency, Hafler delivers the goods consistently. NO OTHER AMP COMES CLOSE! End of story."

RONNIE MONTROSE
RECORDING ARTIST/PRODUCER

"Clean unleashed unmasked raw power at its best . Hafler amplifiers are the bitchenest amplifiers on the planet."

PATRICK WEBER
RECORD PLANT, MCA RECORDS,
CAPITOL RECORDS,
PATRICK WEBER ENGINEERING

Hafler's new Trans•nova reference amplifiers!
"Finally there's an amp I can really cheer for!"

PAUL HOLDGATE
LEAD SINGER OF SMG'S, THE FEAR
"AS FAR AS THE EYE CAN SEE"

Hafler®

THE SONS OF trans•nova ARE BORN IN THE USA !!!

"While I am not a full-time audio production professional, I do take my home studio projects very seriously. Armed with a computer and affordable hardware and software, I believe that a small studio like mine does have the necessary cutting edge tools to produce professional results. However, the one area where I believe that most studios fall short is in their choice of studio referencing equipment. Today's high-end, yet affordable, digital goodies demand equally affordable, pro quality outboard gear to bring out the best that these production tools have to offer. Face it, your PA amp with its noisy fan may be great at live gigs, and your cheap watt-per-dollar "unbalanced studio" amp may sound okay driving your stereo speakers, but they just don't cut it under studio monitoring conditions.

Hafler amps, however, deliver in both respects. The soundstage and depth that I get out of my "balanced" Hafler trans•nova is unbelievable, particularly when you consider the cost of this amazing amplifier. And my Hafler's crystal clear imaging creates a perfect mixing environment for my small studio which rivals those big budget mixing rooms downtown."

BILL REYNOLDS: SR. VP - SUTRO & CO. INC.
OWNER-BEAR LEFT STUDIOS, HOLLYWOOD, CA

9303/9505 7 yr. warranty $1300/$2200

P-3000 5 yr. warranty $799

P-1500 5 yr. warranty $549

Hafler introduces four brand new amplifiers, all with Jim Strickland's award winning and patented Trans•nova circuitry. Ultra high-end reference amplifiers at an amazing price.

MADE IN THE USA

Hafler Trans•nova Technology... A NEW STANDARD!

HAFLER PROFESSIONAL, A DIVISION OF ROCKFORD CORPORATION
TEMPE, ARIZONA 85281 USA
1-800-366-1619 • INTERNATIONAL FAX 602-967-8132

CIRCLE 50 ON FREE INFO CARD

World Radio History

ping theirs. Even if you do not think you need the extra 24 dB dynamic range, at least bits 14, 15 and 16 will probably be more accurate with a good 20-bit converter. You will record the noise floor more accurately, and it has been proven that music can be heard beneath the noise floor!

How does one store 20 bits? Lots of ways: D-2 video machines and digital Betacam machines store 20-bit. Sony, of course, offers the rather expensive but elegant Sony PCM-9000 Magneto-Optical 24 bit recorder. One can also use a Mitsubishi X-86 machine that has been converted for 20-bit recording. The cheapest way is to record on to a TASCAM DA-88 with the Prism MR 2024T box hooked up to it. This turns your Hi8, 16-bit 8-track machine into a 20-bit 6-track (or 24-bit 4-track if anyone ever successfully builds a 24-bit converter).

The PCM-9000 has built in sequencing features. For the other formats, dump the approved mixes to a SADiE, Sonic Solutions, or other 20-bit hard disk editing system, edit it, and dump it back to the DA-88/Prism unit or archive it at 20-bit with an Exabyte tape.

Of course, one can record directly on to one of these hard disk systems, archiving to Exabyte as one goes. The future holds high-density CDs and other means of storing 20-bit information.

DATS

If you are recording 16-bit, the Sony PCM-1630 can offer computer verification that the data has been recorded without any errors. Some pro DAT machines will tell you if it detected any errors while recording, but DATs as a rule are less dependable than the PCM-1630/U-matic format. These days, DAT is by far the most commonly received digital format. At Gateway Mastering Studios, the majority of *all* masters we receive to work on are 1/2-inch 30 ips analog.

Record at 44.1 kHz especially if your final product is going to be a CD. If one is going to work in the digital domain, converting from 48 kHz to 44.1 for the finished CD usually hurts the sound. I recently purchased a sample frequency converter from dB Technologies and it sounds good. Most sample frequency converters do not sound so good.

Besides writing what kind of DAT machine you used to record the tape, write down the sampling frequency, what kind of timecode (or lack of code) is printed along with the sound. Make sure that the tape is clearly labeled. If the tape and the box were to be separated, could you identify your tape amongst a pile of 20 other tapes?

IDs on DATs. When one is making a tape to send to a mastering facility, record a balance tone at the reference level you used at the beginning of the DAT. Please, with a big cherry on top, do not give the tone an ID number! Just start your DAT master, let it go for a few seconds, and begin the tone. As no one but the mastering engineer will ever want to listen to this tone, do not index it! Have the first song be the first index. Working with a client's DAT that says track "5" when it is actually song 4 drives me nuts and makes me make mistakes.

CIRCLE 30 ON FREE INFO CARD

World Radio History

Even with 512 user-adjustable programs, 2-octave pitch-shifting, true stereo operation and more, the most amazing thing is how it sounds.

SOUNDS. The reason Zoom is a recognized leader in digital signal processing worldwide.

To get those sounds into the new Studio Reverb, Zoom engineers sampled the world's finest audio environments to create powerful new algorithms*. They also insisted on a CD-standard 44.1 kHz sampling rate and massive 24-bit internal processing to ensure the highest level of audio over the full 20 Hz to 20 kHz bandwidth†.

Then they added the kind of features that just don't exist in a processor this affordable. Like 512 user-adjustable programs (32 different effects including reverbs, delays, gates, tremolo, chorus, flanging and more) with two dedicated edit controls that affect selected parameters. Giving you literally *thousands* of sound variations.

Plus a smooth 2-octave pitch shift for new harmonic possibilities. And true stereo operation so you can run stereo effects or two discrete mono effects. 2-band EQ. And Zoom Noise Reduction to keep everything studio-quiet.

The Zoom Studio. What it does will surprise you. How it sounds will amaze you.

**Our algorithms are complex, step-by-step computational procedures painstakingly created by Zoom digital engineers that ultimately determine the depth and sound quality of each environment (halls, rooms, etc.).*

†Yes, we know you've heard this before, but definitely not in a reverb costing $249.99.

THE 1202 STUDIO REVERB

ZOOM®

CATCH US IF YOU CAN

Zoom is distributed in the United States by Samson Technologies Corp., P.O. Box 9068, Hicksville, N.Y. 11802-9068 • Tel: (516) 932-3810 • Fax: (516) 932-3815

© 1995 Samson

CIRCLE 53 ON FREE INFO CARD

World Radio History

It may seem obvious, but if you are sending your DAT to be mastered, please be sure each song is properly numbered. If the song fades up, it is nice to have the index start at the beginning of the fade-up, not where the auto-ID feature of your DAT decides to put it! Especially if two songs are crossfaded into each other, it is nice to see exactly where the new track should begin for the CD PQ code (track numbers).

DIGITAL WORKSTATIONS

Digital workstations are wonderful things. It used to be that one took for granted that a sequenced recording coming into a professional mastering room would be properly put together. With tens of thousands of sometimes inexperienced operators now owning inexpensive digital workstations, this is unfortunately no longer the case.

The most common mistakes that occur are:

- Using the workstation in a way that it does not properly clone (make exact copies — the sound is being changed from the editing process). Most good workstations can clone, but many operators don't know when to turn dithering on or off, or if they should remove DC offset filters, and so on. Not knowing the answer can harm the sound of your tapes!
- Chopping off the ends of songs because of monitoring too softly.
- Using software that does not put a slight crossfade at the beginning of each song, resulting in a click from the DC shift. All these clicks will have to be removed.
- "Normalizing" or otherwise changing the level of the music during the editing process. Normalizing makes all the maximum *peak* levels the same. In mastering we try to make the *average* levels the same. If you are making a tape for the A&R department and want to even the levels out, go ahead, but the tape you send to the mastering house should only be edited, not level changed or "preEQ'd." Let the mastering house add it with good gear. Once the sound has gone through a bad digital EQ (and many of them are), that gritty, brittle sound can not be undone!

If you own one of the systems that prints out a nice track sheet but doesn't allow you to actually synchronize your machine to the actual timecode, please note it on your sheet! We professionals are used to getting timecode sheets that actually mean what they say. It is nice to know that your timing sheet, with timings purporting to be accurate to the 80th of a frame, in fact has little to do with the real timecode your DAT is putting out! I am not saying not to send the track sheet, but simply to note that it is all relative to when you actually started the DAT machine by hand.

FINAL THOUGHT

So much of my time is already wasted due to computers that crash or malfunction and tapes that drop-out and other acts of God that if it is possible to help the things we *can* control it will be a better world for me and a cheaper world for you! EQ

THANK YOU EQ READERS!

An open letter from Morris Ballen, Disc Makers Chairman

Dear Friends,

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

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

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

If you haven't seen our **brand new 1995 full color catalog,** call today for your free copy. We offer the most complete packages in the industry and, best of all, we provide the **fastest turnaround.** See for yourself why serious producers and musicians insist on using Disc Makers.

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

Sincerely,

Morris Ballen

Morris Ballen, Chairman

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

What is the Proof Positive™ Reference CD?

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

Call today for 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

CIRCLE 28 ON FREE INFO CARD

World Radio History

A Composer Lies In You

Robert Scovill
Def Leppard

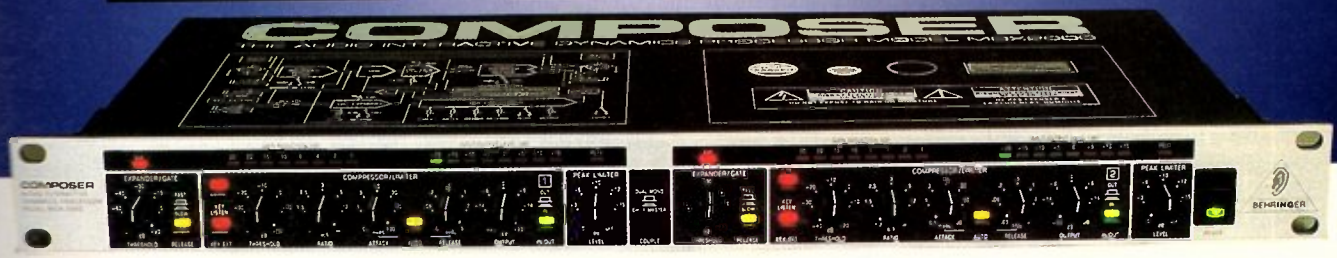
Jim Ebdon
Wet Wet Wet

Stan Katayama
Pink Floyd

Robbie McGrath
Simply Red

Your Name
Goes Here

'Big' Mick Hughes
Metallica



The COMPOSER from Behringer

A Composer Lies In You!

Creative genius. The province of songwriters, arrangers, producers and musicians. And sound engineers. With control over the audio signal at the final stage, you can make all the difference to the final result — but your creativity won't shine through unless you have the right tools for the job. Like a combined compressor/limiter/expander that encourages your talent. Meet the COMPOSER. It's the ultimate dynamics processor for your broadcast, studio and live sound applications. Because, like you, it understands music.

Interactive Technology Gives You Interactive Co-operation

Interactive Technology is the feature that makes the COMPOSER the choice of top sound engineers. Working in essentially the same way as you do, it 'listens' to the incoming signal, and on the basis of what it 'hears', it adapts its settings. However, being analogue computer operated, it is able to react in microseconds, before the human ear registers the need for an adjustment. The result is not only compression, expansion and peak limiting which is more transparent and musical than you'd find in any conventional unit, but also the elimination of side effects such as pumping, noise and distortion etc.

You Have Total Control Of The Sound Process

You can use the COMPOSER subtly, to preserve every nuance of the original material, or like a traditional compressor/limiter to smooth out awkward peaks and troughs. Better still, like the famous faces above, use it creatively to 'compose' the sound, adding your stamp to the overall mix. By putting control into your hands, the COMPOSER allows free rein to your inventiveness.

As you would expect, the COMPOSER can already claim to be an indispensable tool for the modern engineer. Along with Behringer's featured *Blue Riband* Engineers, over 25,000 people like you are already committed users worldwide. And, as you would expect from Behringer, we offer more technology like Safety-Hard-Bypass relays, jack and XLR connectors, and servo-balanced inputs and outputs. Plus, of course, the security not only of Behringer's reputation for high quality and reliable operation, but also of a five year warranty, because we know that once you have met your COMPOSER you'll want to be working together round the clock. In the words of Robert Scovill, the multiple TEC award winner for Mixer of the Year: "The COMPOSER is the unit that made my sound famous."

THE COMPOSER: Make yourself the next Sound Composer.

BEHRINGER®
Your Ear Is The Judge

Distributed by: **SAMSON TECHNOLOGIES Corp,** PO Box 9031, Syosset, NY 11791-9031. Tel: (516) 364-2244. Fax: (516) 364-3888.

CIRCLE 12 ON FREE INFO CARD

World Radio History

Project Record Co. In a Basement

Musicians with their basement project studios are always talking about cutting demos and presenting them to a record company in the hopes of landing a big record deal. Things like that do happen, but usually not to anybody you know personally. It is always someone else that gets the deal just like it is always someone else that wins the lottery. But you keep buying lottery tickets, don't you?

What if you decided to do the whole thing yourself? You have already decided to record your songs yourself, so why not do the editing, the mastering, the album cover design and production, make the CDs, and then sell the finished product to a distributor or press up a bunch of CDs to sell at your gigs? Well, you can do all of those things, and just to make sure it is possible, I decided to try it all myself with two different projects.

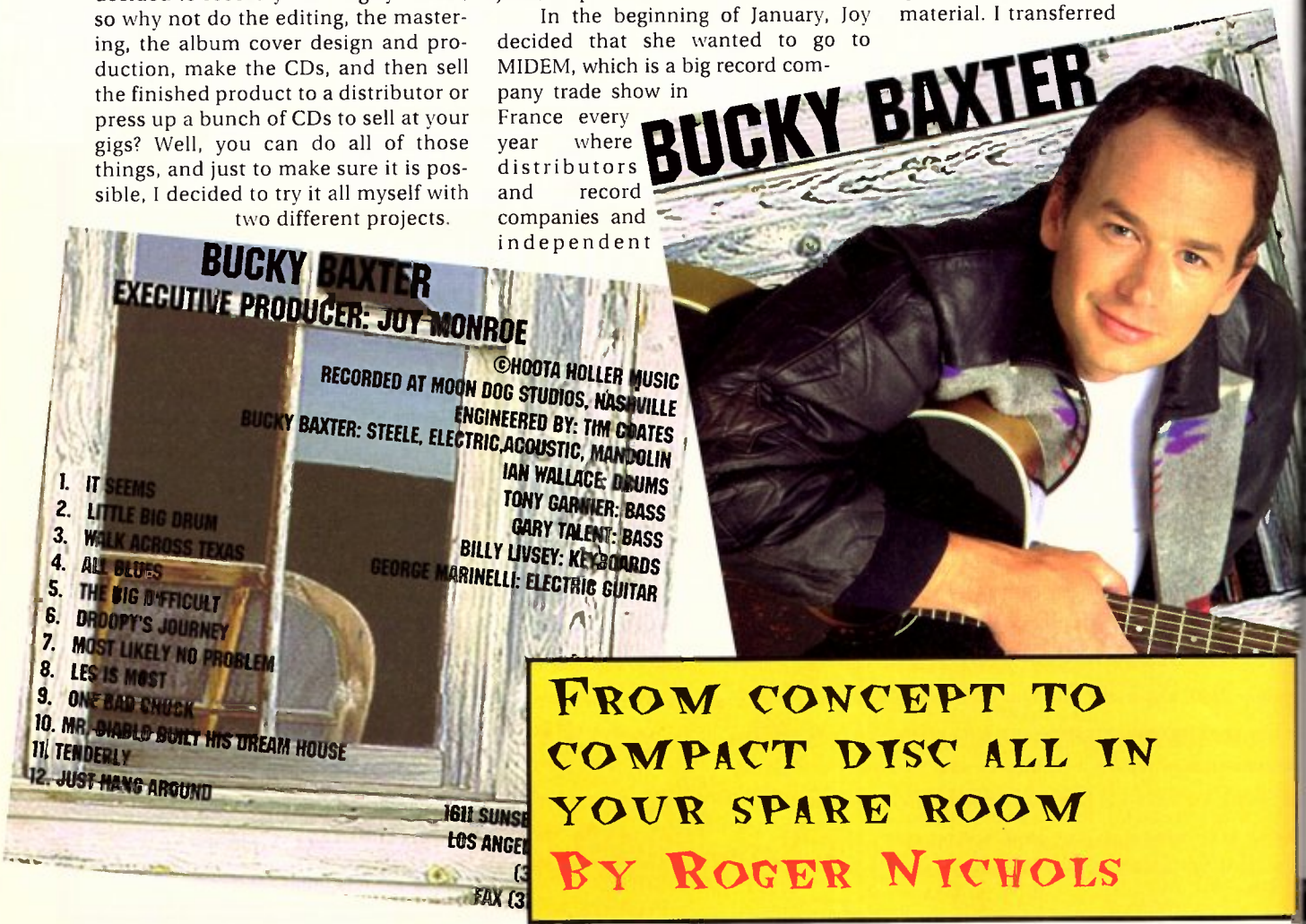
Project #1: Bucky Baxter

Bucky Baxter is a guitar player who plays steel guitar on the road for Bob Dylan. He wanted to do an album of his own, but couldn't get the interest of any record company. He happened to have a project studio of his own in a small, converted one-bedroom house in Nashville. He called up all of his friends and asked them to play, recorded an album's worth of tunes, and then asked me to mix the project. Joy Monroe, a friend of my wife, was the executive producer on the project (she paid the bills for the album).

In the beginning of January, Joy decided that she wanted to go to MIDEM, which is a big record company trade show in France every year where distributors and record companies and independent small companies get together to sell each other product. She was going to make a bunch of DAT copies of Bucky's album to hand out to prospective record companies. She asked me if I could make her 10 DAT copies. (My first reaction was to say "Poof... you are 10 DAT copies," but I thought better of it.) I realized that this would be the perfect opportunity to show off my basement, so I offered to make her 10 CDs instead.

The Music

The first thing I had to do was resequence the album for a better flow of material. I transferred



From concept to compact disc all in your spare room

By Roger Nichols

World Radio History

SWEETWATER HAS IT ALL!

PRODUCTS FROM OVER 100 OF THE BEST NAMES IN THE BUSINESS
IN STOCK IN OUR GIANT WAREHOUSE, READY TO SHIP RIGHT TO YOUR DOOR.

FRIENDLY, DEPENDABLE ADVICE FROM OUR SALES ENGINEERS
ALL OF WHOM HAVE REAL WORLD MIDI AND STUDIO EXPERIENCE.

OUTSTANDING TECHNICAL SUPPORT AND AFTER-THE-SALE-SERVICE
THAT'S FLAT-OUT THE BEST IN THE ENTIRE MUSIC INDUSTRY.

OUR EXCLUSIVE, INDUSTRY-FIRST MONEY BACK GUARANTEE
YOU SIMPLY CAN'T GO WRONG!

In short, everything you need to compose and record great music is right here at Sweetwater Sound. What's more, we treat you like family! See, there's really no excuse for poor performance in this business — there are dozens of dealers who are more than happy to take your hard-earned cash. At Sweetwater, we go the extra mile to make sure all our customers get exactly the right product for their needs at affordable prices and we back up that sale with the best service and technical support on the planet.

Digidesign ▪ TASCAM ▪ Mackie ▪ Korg ▪ Alesis
Genelec ▪ Roland ▪ AKG ▪ Opcode ▪ Neumann
Sony ▪ KRK ▪ Panasonic ▪ JBL ▪ Kurzweil ▪ ART
Mark of the Unicorn ▪ KAT ▪ Marantz ▪ Fostex
Event ▪ Apex ▪ Akai ▪ Lexicon ▪ Fatar ▪ Digitech
Furman ▪ Summit ▪ TOA ▪ DBX ▪ Shure ▪ Crown
Carver ▪ Sennheiser ▪ Passport ▪ Rane ▪ Coda
Tannoy ▪ Soundcraft ▪ TAC/Amek ▪ JLCooper
Dynatek ▪ BBE ▪ 3M, Ampex and Denon Tape
Glenfide ▪ Mac & IBM Software & MIDI Interfaces
OTHER MAJOR BRANDS TOO! CALL FOR LISTING!

TASCAM DA-88 DIGITAL MULTITRACK

DIGIDESIGN SYSTEMS FOR MAC & PC

KURZWEIL K2000 SYNTH/SAMPLER

GENELEC 1031A MONITORS

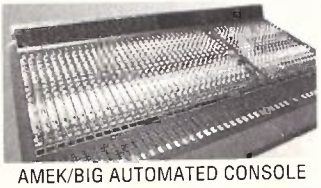
SONY MDR-7506 HEADPHONES

DIGITECH GSP2101 PREAMP/PROCESSOR

TANNOY PBM 6.5 II

KAT TRAPKAT

LEXICON PCM-80 DIGITAL REVERB


AMEK/BIG AUTOMATED CONSOLE

KORG X3 SYNTHESIZER

E-MU SYSTEMS EIV SAMPLER

AKG C12 VR MICROPHONE

JBL SR-SERIES PA SPEAKERS

AKAI DR8 DIGITAL MULTITRACK

APHEX SYSTEMS DOMINATOR II

ROLAND JV-1080 SYNTH MODULE

DBX MODEL 266 COMPRESSOR/GATE

NEUMANN TLM193 MIC

QUICK-LOK SL-200 TWO-TIER STAND

ALESIS ADAT DIGITAL MULTITRACK

MACKIE DESIGNS 8-BUS MIXER

CROWN POWER BASE 3 AMPLIFIER

AUDIO TECHNICA AT4050 MIC

KRK K ROK MONITORS

FOSTEX RD8 DIGITAL MULTITRACK

MARK OF THE UNICORN SOFTWARE

OPCODE SYSTEMS SOFTWARE

MARANTZ PROFESSIONAL CD RECORDER

PLUS TONS OF OTHER GREAT PRODUCTS WE JUST DON'T HAVE ROOM FOR HERE!

SWEETWATER IS ON THE INTERNET!
Contact us at "sales@sweetwater.com"

ARE YOU KIDDING? Of course I want to receive a full year of Sweetwater Sound's SWEET NOTES newsletter absolutely free!

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
PHONE ( ) _____
Mail coupon to address below or call for your free subscription!

Not your average music retailer ...

Sweetwater SOUND INC.®

VISA · MasterCard · American Express Cards · Discover · Sweetwater Sound Inc. Technology Card

CIRCLE 67 ON FREE INFO CARD

5335 BASS RD., FT. WAYNE, IN 46808 **(219)432-8176** FAX (219)432-1758

World Radio History

each tune from DAT onto the optical discs of my Akai DD-1000. In the optical disc recorder I cleaned up the front and back end of each song and adjusted the playback levels for better transitions from tune to tune. You would be amazed at how much more "finished" a song sounds if you don't hear any hiss or noise just before the music starts. After the first playback of the entire album in its new order, I decided to change some of the spaces between songs. A few little tweaks (high-tech term) to the edit list, and I was ready to roll.

The length of the album was about 48 minutes, so I used 63-minute CD blanks. I loaded one into the Marantz CD-R 610 CD recorder, set the input to digital, pressed Record-Pause, and played the album back from the Akai to make sure that the signal was getting there properly. This comes from years of experience in making tape copies when I would start the record machine, start the playback machine, and wonder why nothing was showing up on the record machine meters. It was always "one more button" that I forgot to press before I started. After doing the same thing with my CD recorder a few times, I thought it was better to attempt a dry run than ruin a CD by recording blank space at the beginning. Remember, you can't go back and erase mistakes on a CD. The dry run worked fine, and I was almost ready to go.

Right here I would like to touch on START IDs. START IDs are the codes that are put on the CD so that you can find the beginning of each tune. A START ID on a CD is much like the START ID on a DAT tape. On a DAT machine you can select AUTO START ID and the machine will automatically place one on the tape at the beginning of each song. Because the DAT machine doesn't know to record the ID until after the music gets loud enough to trigger it, the START ID is always a little late. In early DAT machines, when you skip to the next tune, the machine would fast forward to the next START ID and then start playing. You usually missed the first few milliseconds of the song (I know that is my favorite part of any song, the first few milliseconds). Some players, like the Sony PCM-2500, would allow you to go to each tune and move the START ID earlier to avoid this problem. Current DAT machines are much smarter. When you skip to a START ID, the machine knows that the ID is late, so the machine goes up to the ID, and then backs up a little to get a running start at the tune.

CD players don't do that. CD players expect the START ID to have been placed about 1/2-second before the music actually starts. There was no need for all of the fancy software because there was not ever supposed to be recordable CD recorders with AUTO START ID. When a CD master is produced, a sheet of paper with timecode information lists the timecode of every START ID on the CD. This information is entered into the computer that cuts the glass master. The computer then places the START ID information in the Table Of Contents of the CD (located at the beginning of the CD before the music starts). So, anyway, the point is that if you use the AUTO START ID feature of the CD recorder, whenever you skip to the next tune, you will miss my favorite part of the song.

The reason for this little side trip is that I didn't want anyone to miss the first few milliseconds of Bucky's songs, so I listened to the transitions between songs and wrote down the times for each START ID. This, hopefully, was after one song faded out and about half a second before the next song began.

The SADiE hard disk editing system automatically produces an edit list and will automatically send START ID commands down the digital audio link to the CD recorder. The Akai DD-1000 does not provide this feature, so I had to watch the time display and press the manual START ID button before the start of each tune.

HHB, in London, sells a box that connects digitally between a DAT machine and a CD recorder. The box has some delay memory for the digital audio, and converts DAT START IDs into CD START IDs. Because the audio is delayed but the START IDs aren't, the CD start ID is placed before the music starts. What a concept! I have heard rumors that some of the next generation of CD recorders may have this feature built in, but not in time for this article.

So here we go, the Akai is ready, the CD recorder is armed, all that is left to do is grab whatever you grab in intense situations and jump in. I took the CD recorder out of Record-Pause, and pressed Play on the Akai. Everything worked fine, and the first blank disc was burning its way toward CDness [EDITOR...don't change this, it is a real

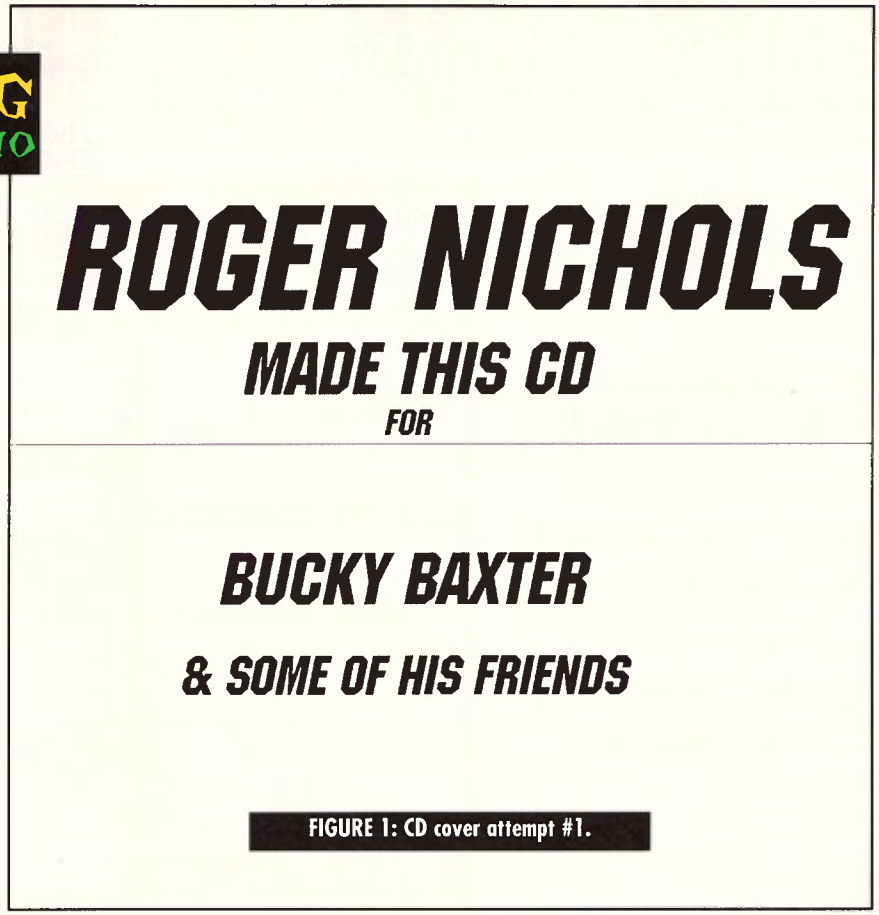


FIGURE 1: CD cover attempt #1.

World Radio History

HEAR THE FUTURE

DIC'S NEW 8MM DIGITAL AUDIO CASSETTE IS DESIGNED FOR DIGITAL AUDIO MULTI-TRACK RECORDING!

Split personality?..Not this cassette!

It bridges the gap for Tascam DA-88 users who require a true digital audio cassette designed to deliver the highest levels of performance possible. Today's tape based digital 8 track recorders incorporate technology originally designed for video but that's where the similarity ends. Video technology compensates for the drop outs inherent in video cassettes but Digital Audio Multi-track Recorders require drop out free performance. **That's what DIC's new 8mm Digital Audio Cassette is all about... Digital Audio Multi-track Recording! No identity crisis here!**

DROP OUT FREE TECHNOLOGY: DIC's premium professional grade metal particle tape.100% certified for critical applications where drop out free performance and high speed shuttling are required.

SPECIAL BACKCOATING: Specifically engineered for audio recording (totally different than mass produced video tape) engineers can shuttle the tape in during editing with confidence that the backcoating will not be shattered.

REALTIME LENGTHS: In realtime lengths of 15, 30, 60 and 120 minutes unlike a 120 video cassette that actually provides only 108 minutes of recording time.

Additional Audio/ Video Products :
DAT cassettes • DAT drive cleaner. • Optical discs. • Recordable CD's
• 4mm & 8mm data cartridges. • 8mm video cassettes. • SP Beta Products.• plus more!

MADE IN USA

DIC///DIGITAL™

You'll hear the future..today!

CIRCLE 25 ON FREE INFO CARD

Glenpointe Centre West, 500 Frank Burr Blvd., Teaneck, NJ 07666.
Phone: 201-692-7700 or 1-800-328-1342, Fax: 201-692-7757

World Radio History

word, honest). A the correct times, I punched the START ID button and after the CD was done I pressed Stop. First one down, nine more hours to go. (Maybe this wasn't such a good idea to volunteer for this job after all, but hey, I do live in the Volunteer State).

Remember, I said that in CD production, the Table Of Contents is written to the CD before the audio. Well, when you are recording your own CDs, the machine does not know where the tune is going to be until after it is recorded, right? So, the way it works is the recorder skips over the Table Of Contents area while you are recording. It waits until you have recorded all of the selections and pressed the START ID button wherever you wanted. After you are done recording, you press a button labeled Finish. When this happens, the recorder goes back and writes the Table Of Contents area of the disc. After this is complete, the disc is no longer recordable, and can be played back on any CD player.

Art: More Than a Guy's Name

During the recording of the CDs, I thought about printing up labels for the front of the CD jewelbox to list the contents. You know: the names of the songs, who produced it, who played on it, and who spent ten hours making the CD copies. My initial impression was to do something like fig. 1, but I was trying to help the project, not hurt it.

The light bulb went off in my head as I was cruising through my computer and realized that I had a copy of Adobe Photoshop 2.5 that I had stolen from a friend. I had been looking for an excuse to play with it for a long time, and now was my big chance. I decided to see if I could make these ten CDs look like they had just come from the New Release bin at Tower Records.

After talking with Joy about what should be on the cover, she told me that she had spent a lot of money on portraits of Bucky, and could I use one of them for the cover. She sent me a 2-1/4 by 2-1/4-inch transparency of the picture she wanted to use. I found a service bureau in Nashville that would scan the transparency and place it on a Kodak Photo CD for $40 including the CD. Any additional photos would be added to the CD for $20 each. I got the CD back the next day, and proceeded to load it into Photoshop. It looked great!

My kids had (I used "had" because they are not getting it back) an Apple Color Style Writer 2400 color ink jet printer. The printer's resolution is 360 dots per inch, and so that was the resolution I selected for the Photoshop project.

The scanned photo that I was going to use for the cover of the CD booklet had just a white background. I wanted to put something behind the photo. Bucky is sort of a Country guitar player and we are in Nashville, so what wood (pun, not bad spelling) be more appropriate than the side of an old barn. Placing the barn wood behind Bucky was much easier in Photoshop, and I didn't have to scrape off

WANT TO RECORD SOUND LIKE A PRO? OF COURSE YOU DO!

That's why you need the award winning *Shaping Your Sound* video series.

Renowned teacher and engineer **Tom Lubin** shows you everything you need to know about **MICS, REVERB & DELAY, MIXERS & MIXING, EQ, COMPRESSORS & GATES,** and **MULTITRACK RECORDING.**

These 5 videos include hundreds of demos, animations and live music examples in hi-fi stereo. Used in recording schools worldwide, *Shaping Your Sound* is crammed with 132 lessons in 6½ hours.

You've spent thousands on hardware — now learn to get the most out of it!

FIVE VIDEOTAPES ONLY $99.95

VISA/MC/AMEX
shipping and handling extra

11 Rating! MIX Magazine

call today.
800-777-1576
First Light Video Publishing (310) 558-7880

CIRCLE 35 ON FREE INFO CARD

Shopping for E-mu's ESI-32?

InVision Guarantees You the Best Deal — Anywhere!

After you've called around, make your *best deal* on an ESI-32 at InVision. We guarantee that our prices are unbeatable. Why? Because you'll need samples and we own a 100-title CD-ROM library full of the industry's best samples! Orchestral, pop, ethnic, dance — whatever sound and size you need.

And we get crazy with our CD-ROMs. We'll throw in CD-ROMs and CD-ROM drives just to make you a deal. We'll quote you on RAM, SCSI, hard drives, and you'll think we accidentally quoted you wholesale prices.

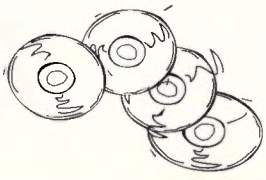
Just purchased an ESI-32? Don't worry. We'll upgrade it with the world's largest E-mu sample library and the hardware that will make your system *smoke.*

Just more advertiser hype? InVision has put together more ESI-32 packages than any E-mu dealer. For what you could (or did) pay, you'd best call us and find out why.

Call 800.468.5530

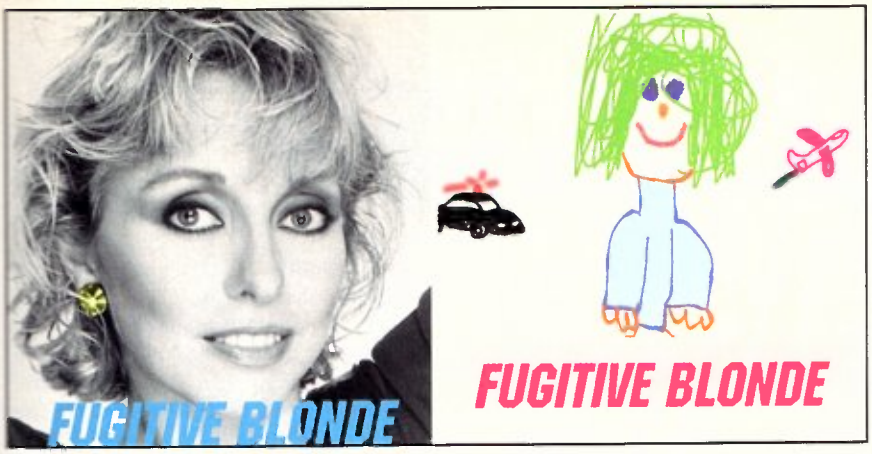
Mention Q495

InVision INTERACTIVE



CIRCLE 82 ON FREE INFO CARD

World Radio History



HAVE YOU SEEN THIS WOMAN?: Two views of the Fugitive herself.

my shoes after the session. I then created the text for the title. In a highly creative moment I decided on *Bucky Baxter* for the CD title.

I wanted a background for the text and credits on the inside of the CD booklet. I found a stock photo of an old window. I loaded it into Photoshop and then proceeded to mess with the brightness and contrast controls to make the picture light enough so that the text that was going to be placed on top of the photo would show up. I typed in all of the text and then experimented with different sizes and fonts until I came up with something I liked. I then placed it on top of the photo to produce the results depicted here.

The next step was to place the credit picture next to the cover photo so that they would print on a single piece of paper. This would allow you to fold the printed copy and slip it into the CD jewelbox just like the big guys do. I changed the size of the canvas in Photoshop and copied the credit picture to a place alongside of the cover photo. Done.

The final task was for the back of the CD. This area is bigger than the CD booklet and includes two little strips that become the front and back spine of the CD box. This vertical area is where the titles go so that you can read the name of the CD when they are stored on your CD shelf.

The dimensions of the CD booklet is 119 mm high by 119 mm wide when folded. The back of the CD case is 116 mm high by 152 mm wide including the end strips, which are each 7 mm wide. I wanted the same information to be presented on the back of the CD, so I decided to use the same picture (which they do on most commercial CDs). To fill in the extra area, I cloned part of the wood around the window and copied it into the empty space. I then typed the text that I wanted to show on the end spines, rotated it vertically, and placed it over the picture. After printing, the picture needs to be folded 7 mm in from each end to be placed properly under the plastic insert in the CD jewel box, so after the first printing and unsuccessful folding attempt, I placed fold marks in the proper place on the picture. Try to remember, I didn't just fall off of a pineapple truck. That was a few years ago.

Time to print the pictures. Hewlett Packard makes some glossy paper for ink jet printing that is perfect for CD applications. Discounted it sells for $51 for 50 sheets, so I try not to waste very many sheets. The CD back picture would fit two to a sheet of paper, so I produced a two-up version of the back for printing purposes. Prepare to spend some time waiting for the printer to crank out the photos. It took about 20 to 30 minutes per page for the printing to take place. If you have the extra money, get a nice Kodak or Techtronix dye-sublimation printer for the job. They can process the same picture in about two minutes. If you want someone else to print it up for you, Kinko's has a dye-sub printer and Photoshop software, so you can do everything at Kinko's, or just take your disk down there for printing. I hope you have a removable SyQuest drive for the Kinko's run, though, the print files are about 20 MB each at 360 dots per inch.

The last thing to do before the CDs went out the door was to write the name of the artist on the actual CD so that you would know what it was when it wasn't in the jewel box. What usually happens is that a label is typed and placed on the back of the CD, or you just write on the back with a Sharpie. Well, not me, president of the Gear Sluts. I went down to Kinko's and had an overnight rubber stamp made that said BUCKY BAXTER with letters 1/2-inch high and a text length of three inches. I then used a permanent ink stamp pad and stamped BUCKY BAXTER on each of the CDs.

Pop out the plastic insert, bend the tabs and place the back photo, replace the plastic insert, put in the CD (don't forget this part), fold and

BE A RECORDING ENGINEER
★ TRAIN AT HOME ★

Learn to become a professional recording engineer at home . . . at a fraction of the cost of most resident schools.
Easy Home-Study practical training in Multitrack Recording including the latest in Digital and MIDI.
Join the Audio Institute's successful working graduates or learn how to build your own studio. Career guidance. Diploma. Job placement.
SEND FOR FREE INFORMATION
Audio Institute of America
2258-A Union Street, Suite AN
San Francisco, CA 94123
For A Sound Education™
AIA

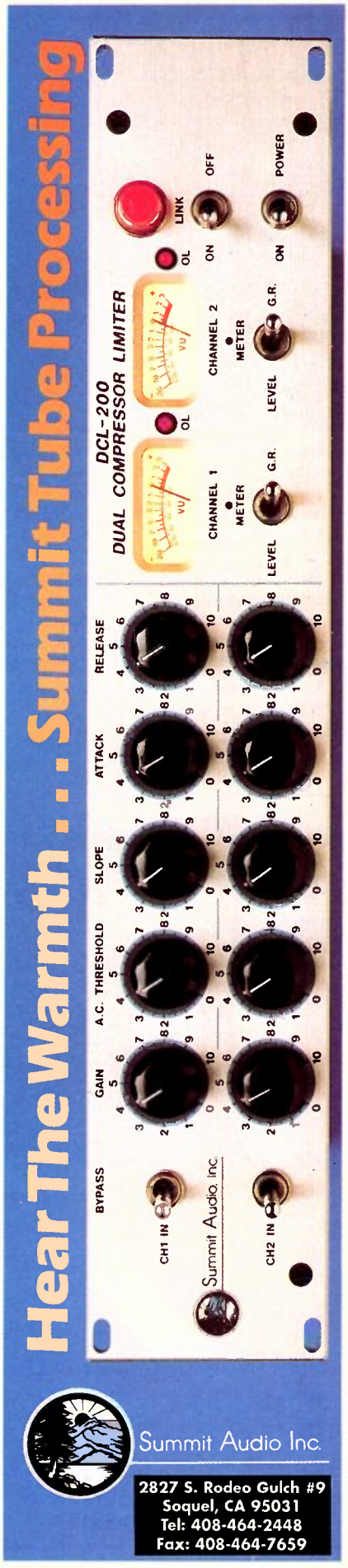
CIRCLE 14 ON FREE INFO CARD

SONEX IS NOW BETTER.

New and improved SONEX will ensure that every sound rings true, without echoes or reverberation. illbruck's family of SONEX products is setting new standards, with completely **FIBER-FREE** acoustical solutions in exclusively **CLASS 1** materials. Send today for a free brochure.
illbruck
Minneapolis, Minnesota
1-800-662-0032
(612)520-3620

CIRCLE 41 ON FREE INFO CARD

World Radio History



CIRCLE 83 ON FREE INFO CARD

MASTERING IN THE PROJECT STUDIO

slip in the booklet, and bingo, finished product out the door.

Project #2: Fugitive Blonde

Not to be out done by Bucky's CD, my wife who is lead singer and songwriter for a new band called Fugitive Blonde (we won't discuss the reasons for the name choice) decided to go with her friend Joy to MIDEM. "Gee, that looks easy, why don't you make some CDs of my songs to take along?" she asked. "Sure," I said, thinking that doing it one more time would still be fun.

Audio Clean Up

The recordings for Fugitive Blonde had been compiled over quite a few years on many different machines. They included Akai MG-1212 analog 12-track, ADAM 12-track digital, Fostex G-24S, and Alesis ADAT. The mixers used ranged from a Roland 24-input keyboard mixer, to an SSL 4000E (well, so I took the ADAM to the studio one day as a test, OK?). The mixing environments ranged from studio control room to untreated spare bedroom. Most of the material was on DAT tapes, except for a couple that were on Sony F-1 with emphasis (OK, so I made a mistake once).

I was originally content with the idea of just copying the songs to CD for the purpose of obtaining interest at a record company so that there would be a budget to recut the material. I started by digitally transferring everything to one DAT tape for ease of handling. I decided to try running one of the songs through the t.c. electronics M5000 digital audio processor to play with the new 3-band digital limiting software that is available for that box. I started messing around with the compression parameters and the crossover frequencies between bands, and all of a sudden it sounded like a finished, mastered record, but with a little hum and hiss. It sounded so much better that I ran every tune through the compressor. I didn't always use compression; most of the time I would just raise the level of the upper band to make the mix sound a little brighter and compress the low end to add some meat to the bass and kick drums. Cool! I started getting excited.

I then transferred the results into Digidesign Sound Tools on the Mac. Once in Sound Tools, I loaded in each song and listened to the beginning. About half of them contained some hum, or hiss, or both. I happened to have DINR in my Sound Tools, so I let it analyze the hiss before the downbeat of the song and set its filters as it saw fit. I usually chose about 10 dB of noise reduction and then processed the file. If there was any hum, I also ran it through the hum removal section of DINR. It worked great. Finally, I trimmed the noisy space off of the beginning of each tune. Ready to start cranking out CDs.

With all of the tunes in Sound Tools format on the Mac hard disk, I used Masterlist CD to sequence the songs for transfer to the CD. I simply opened each audio file in the order I wanted them played, and selected the space I wanted between songs. The start and end times of each tune are displayed automatically, and a running timer lets you know where you are so you can punch the START ID button on the CD recorder. Digidesign says that there are hardware limitations that will not let Masterlist CD automatically write START IDs to an external CD recorder. Another brownie point for SADiE.

Enter Pinnacle Micro

Like the Lone Ranger arriving just in time to save the day, the new Pinnacle Micro RCD-1000 CD recorder arrived on my doorstep. It is a little half-height unit that looks like an external CD-ROM player, except it records! I wouldn't have to stand around and manually record START IDs any more.

It took less than 10 minutes to hook up the new box, load the software, and re-boot the computer. The audio data was already on the hard disk...(Wait just a darn second, here. A computer hard disk is spelled with a "k," but an audio disc is spelled with a "c." Now that I have digital audio on my hard disk (disc), how am I supposed to spell it? How about disck?) Anyway, where was I? Oh yes, I loaded the disc-writing software and placed a blank disc in the RCD-1000. They have a cool drag and drop interface that lets you set up the CD-R recording session. You just select Audio as the format for the CD and drag the names of the songs over to the audio portion of the display. Choose Create from the menu and get ready to write.

As a safety factor when writing to CD,

continued on page 119

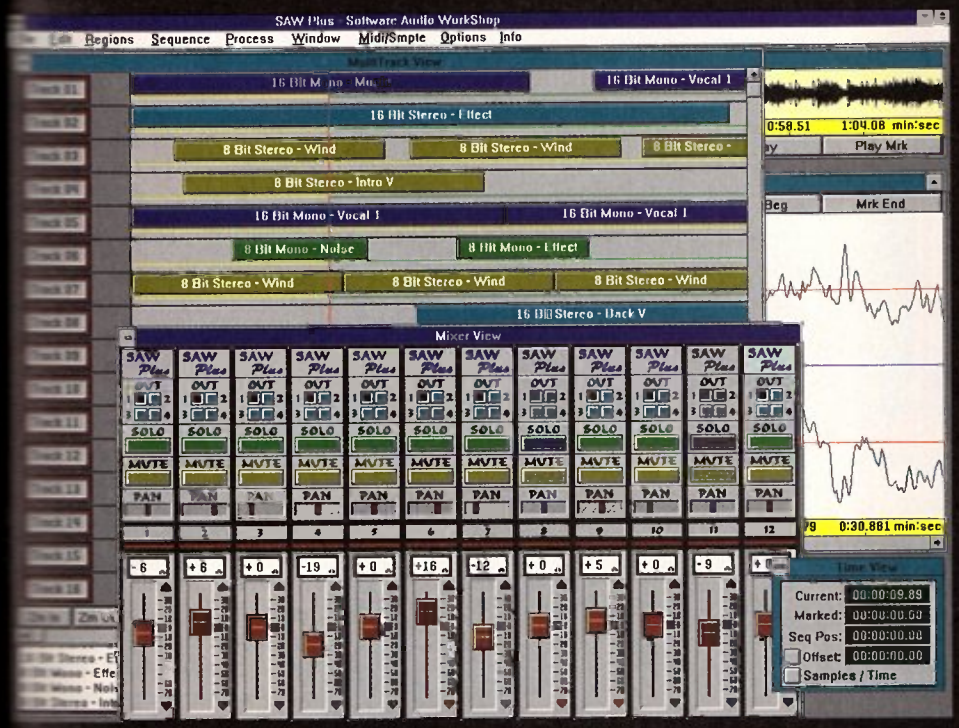
World Radio History

Innovative Quality Software, designers of the Award Winning SAW Software, announces:

SAW Plus
Software Audio Workshop

PUSH YOUR PC PAST THE LIMITS!

With Assembly Language Programming Power



- ➤16 Live Virtual Track Playback On Any Windows™ 16 Bit Sound Card.
- ➤Auto Conversion & Live Mixing of 8 & 16 Bit Resolution SoundFiles.
- ➤Multiple Card Outputs. (Up to 4 Cards)
- ➤Live Blending Of Mono & Stereo Tracks For Up To A Maximum 32 Track Playback On A High End Machine.
- ➤Complete Drag & Drop Non-Linear Editing.
- ➤Graphic EQ, Gate/Compressor & Echo Effects Built In.

Suggested Retail Price $999.00

Unquestionably the Fastest, Most Cost-Effective 16 Track Non-Linear Hard Disk Editing Solution for the PC!

Other products from Innovative Quality Software:

SAW
Software Audio Workshop
A professional 8 track (4 stereo pairs) Hard disk editor

SAW UTILITIES RACK #1
High quality effects processing for the SAW Software

SAMM
Software Audio Midi Mixer
A revolutionary software interface to the Yamaha ProMix-01 digital mixer

INNOVATIVE QUALITY SOFTWARE
2955 E Russell Rd
Las Vegas NV 89120-2428
Tel: (702) 435-9077
Fax:(702) 435-9106

CIRCLE 43 ON FREE INFO CARD

World Radio History

BOTH SIDES NOW: A REPLICATOR'S VIEW

It is impressive how much enthusiasm, talent, and effort the typical studio puts into a project. It seems like no effort is too great in achieving that special sound. Yet no matter how perfect that effort is, there is always one final step between your studio and the customers ears. That step is the one where your creation actually becomes a product the consumer can buy and enjoy.

Even with the incredible attention to detail expressed in the studio, sometimes the simplest things get overlooked when the master goes out for replication. Many engineers consider such details to be trivial; yet failing to deal with them correctly at the studio can have catastrophic effects on your project. These effects can be anything from sonic degradation to intolerable delays. To avoid unnecessary hassles, here are a few things to consider.

SLIPPED DISCS: There are things you can do to help the replicator make your CD sound the best that it can

Keep a back-up. It's amazing to think about the number of one-of-a-kind original masters that get sent to replication plants each year. After weeks, months, even years of energy heaped into these projects, it should be considered an absolute necessity to prevent your efforts from being lost. Always make a clone or back-up of some type before submitting the project for replication. Every engineer knows that the odds of something going wrong with an original are always greater than the chance the copy will become defective. Murphy's Law guarantees this. Remember: machines fail, tape cartridge housings fail, and so on. Occasionally the unthinkable happens, like a machine eats your tape, it gets damaged in shipping, or perhaps it just grows legs and walks away — never to be seen again.

With digital technology as it is today, there is just no excuse for an original master to leave the studio. If lost, the energy of that original project will most likely be gone forever.

A master isn't a master without proper documentation. The only documentation accompanying some masters is the word "RUSH." About all a replicator can do with those masters is hurry up and put them in the "hold" file. If you want to avoid delays, perhaps nothing is more important than the "technical contact's" name and phone number. After all, who knows more about a master than the person responsible for it. Critical information such as the number of IDs, the start and ending times, and the total length of the CD are frequently omitted from J-cards and track sheets. Even alignment tones are frequently missing from analog masters.

It just isn't possible for the replicator to give you what you want, unless you tell them exactly what you want, and information is the tool that enables them to do just that. It is not likely that you will provide the replication plant with too much information, so be thorough. There isn't enough time for the engineer to "premaster" before premastering. To be even more helpful, include the sampling rate. Note if it changes between cuts. Mention "hidden tracks" and their spacing relative to other cuts. If you are sending a DAT or 1630, and the track IDs on the tape are not correct, please note this as well. Mastering engineers are

THE PATH TO A GREAT CD LEADS THROUGH GOOD COMMUNICATION WITH YOUR REPLICATOR

BY ELLEN THREATT

World Radio History

"Can I trust my masters to DAT?"

Apogee

Digital audio unveiled.

"Yes."

Over the years, Apogee has focused its efforts on one goal: making digital audio better. The **Apogee DAT** carries on the tradition. It addresses all your concerns about using the DAT format in the professional world. Consistency. Minimal errors. Reliability. And above all, longevity.

We collaborated with major Japanese surface technology specialists KAO to improve their already impressive DAT specification, adding features critical to the needs of the pro-audio industry. Every element has been re-engineered: from the tape surface to the shell itself.

Our tests indicate that the Apogee DAT has an archive life of over 30 years – the longest in the industry – thanks to proprietary passivated metal particles that, quite simply, won't rust away. The graded magnetic coating yields vanishingly small error rates, yet makes the tape more durable. Output levels are as much as 10% higher than other DAT tapes. The heat-resistant housing minimizes static electricity problems and significantly improves tape handling. The special hubs minimize end-of-tape damage. The Apogee DAT exceeds even the tough DDS (Digital Data Standard) criteria, which require less than one error in 360,000 flux transitions—five times better than required by the IEC60A audio standard.

The result is a truly professional DAT tape: a tape that sets a new standard in DAT mastering. Now you can sleep at nights, knowing your masters are safe – and not slowly rusting away.

Trust your masters to Apogee DAT and you'll be in good hands. Our tape will deliver when you need it... for a long, long time.

APOGEE ELECTRONICS CORPORATION
Sales & Marketing: 3435 Ocean Park Boulevard #211, Santa Monica, CA 90405. Tel: 310-314 1700. Fax: 310-452 4343
Business & Engineering: 3145 Donald Douglas Loop South, Santa Monica, CA 90405. Tel: 310-915 1000. Fax: 310-391 6262

CIRCLE 11 ON FREE INFO CARD

World Radio History

MASS
Modular Acoustic SubSpace
TOTAL ACOUSTIC CONTROL

at the mic...
with the QSF System

at the mix...
with the ATTACK System
ASC ACOUSTIC SCIENCES CORPORATION
Pro Studios / Project Studios
1-800-ASC-TUBE
CIRCLE 02 ON FREE INFO CARD

LEARN THE ART OF RECORDING
You can get the practical, real-world skills needed to successfully start your career as a recording engineer, producer or studio musician. •Hands-on approach, learning by doing •Previous experience not required •Complete 300 hours of training in less than 2 months •6 studios filled with the latest equipment •Small classes, excellent personal attention •Job placement assistance •Financial aid available •Low cost, on-campus housing
For free brochure, call or write today
1-800-848-9900 1-614-663-2544
The Recording WorkShop
THE RECORDING WORKSHOP
455-Q Massieville Rd
Chillicothe, Ohio 45601
Ohio State Board of Proprietary School Registration #80-07-0696T
CIRCLE 70 ON FREE INFO CARD

MASTERING IN THE PROJECT STUDIO

not mind readers, and they are under pressure to PQ and process your masters efficiently and correctly the first time around. Supplying this information right on the source will ensure swifter service and a happy outcome.

Does the engineer think the way you do? Editing systems allow audio to be manipulated in a multitude of ways. If you cannot prepare a master completely for replication and have to rely on the premastering engineer for the last few details, make sure you communicate succinctly. It is quite possible to interpret a client's wishes when it comes to sequencing and ID placement, but the infinite editing possibilities make adjusting fades, levels, and equalization a matter of talent and taste. Do not assume the engineer will hear problems and automatically correct for them. What is artistic expression for some is a defect to others.

Providing written or even verbal instructions for the more artistic processes is woefully inadequate. In a perfect world, the project studio engineer could say "Raise 2k 3 dB, with a Q of 4," and the pre-mastering engineer could successfully perform the task. However, in the real world, achieving the desired effect usually means sending Ref's back and forth, costing time and money. If you must entrust these fine-tuning adjustments to the premastering engineer, you may want to make an appointment to sit in on the process. Otherwise, you may just have to settle for his/her interpretation of what you want.

Master reliability. For clients who have little experience interchanging masters with other studios, they are often unpleasantly surprised to find that their masters don't always playback properly in the replicator's machines. Even minute alignment variations can create big problems. Though virtually all media is capable of compatibility errors, contact media is especially vulnerable. The more often these masters get played, the more likely they are to develop audible problems. Choose your blank media carefully. Lots of advertising and paid endorsements do not necessarily indicate product quality. Real reliability is usually a combination of blank product consistency, machine maintenance, and proper handling.

In a typical week, we receive many unusable masters. Although the 1630 format is very robust, the failure rate can approach 5 percent. With R-DAT, the number hovers between 5 and 10 percent. Optical media fairs much better with handling damage being the major contributing factor.

Preferred format. If you work with analog formats, make sure your replicator is equipped to handle your track format and any noise reduction system you may be using. There are so many variations, it is difficult to support them all. Any replicator eagerly welcomes PQ-encoded digital masters with accurate timing tables. These masters go straight to glass and can cut time off the manufacturing process. However, all replicators do not work with the same formats, so be sure you inquire as to which format they will prefer. If you submit a PQ-encoded DAT and your replicator cannot read the PQ table from the DAT, then there is usually a delay while your DAT has to be transferred to a 1630 or PMCD, and rePQ-encoded.

Sony 1630's and PMCDs are the most commonly used formats for glass mastering because the mastering systems were designed with them in mind. Not everyone is aware that multisession, write-once, read-many CD-Rs contain higher numbers of concealed errors than the single-session PMCD. These errors occur during compilation when the sync clock is interrupted and then restarted to compile each segment of the session. During each stabilization of the clock, track-pitch variations and jitter usually occur. Since the clock is never interrupted on the single-session-type PMCD, they will not contain these errors.

Most glass-mastering systems are designed to abort the process when detecting a certain level or type of errors. When glass mastering from multisession CD-Rs it is usually necessary to disable the error detection process. It is then not possible to monitor the master for errors that may result from other causes. This means these errors transfer to the finished CD product. Although these CDs will play fine in carefully cali-

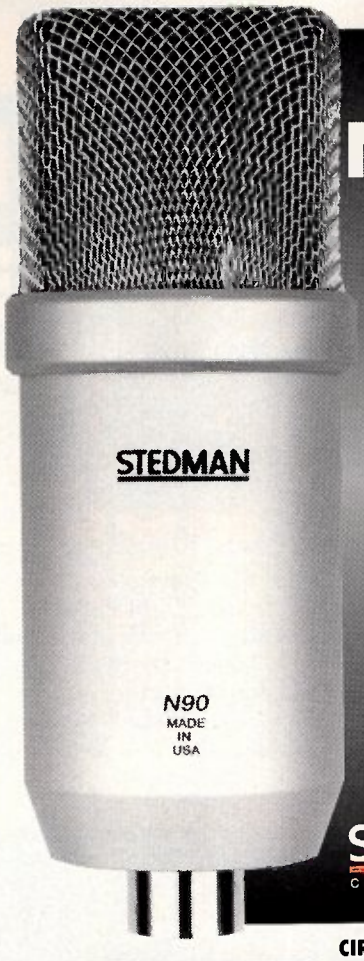
World Radio History

brated reference players, as well as most machines, there is always a risk that performance will be less than desirable in certain players. Poor performance can be exhibited in the form of mutes, glitches, noise, or audible distortion. This problem can be an important consideration if your product finds its way into first generation players, low cost portables, and car units.

Consider format limitations. It is important to consider the practical limitations of not only your mastering format, but the finished CD as well.. We once received a master from a client who designed a game that worked in conjunction with an audio CD. He already had the boards dye cut and printed and invested well into six figures on the project. When we received instructions with the master, we were told to it was supposed to have 120 tracks. What a bitter lesson. Maximum audio data storage for both PMCD and CD-R formats are 74:15, with 99 cuts. Though it is possible to mold discs from tape-based digital formats that extend beyond this, it is not recommended. The molding process tolerance window narrows with respect to play ability as you push beyond 75 minutes.

Summary. These guidelines should be useful both to the first time CD customer as well as the experienced project engineer. While not quite as exciting as other aspects of recording, working with your replicator can go a long way toward making your project a success.

Ellen Threatt has been director of mastering and audio quality control at American Multimedia, Inc., for 11 years. A.M.I. is one of the largest independent replicators in the U.S. with an output of several million CDs and tapes monthly. Ellen has personally mastered over 20,000 titles. Her department receives over 200 masters per week and she currently oversees production in five suites, that operate six days a week, three shifts. She is experienced in many facets of mastering including nearly all popular analog and digital formats.



NOTHING BETTER
than a BIG SOUND...

The N90 gets it!

Ask your dealer or call us today!
1-800-873-0544

List $399
Optional Shock Mount $49.50

STEDMAN CORPORATION
4167 Stedman Dr
Richland MI 49083
Phone 616-629-5930 • Fax 616-629-4149

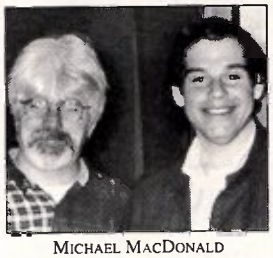
CIRCLE 62 ON FREE INFO CARD

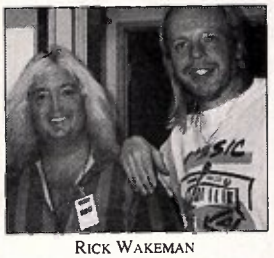
WEST L.A. MUSIC
GUARANTEED LOWEST PRICES!

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!

Stevie Wonder
with Rick Waite - General Manager


Michael MacDonald
with Sandy Sobel - Advertising Dir.


Rick Wakeman
with Glenn Noyes - Drum Dept. Mgr.

"WHERE THE PROS SHOP"

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

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

CIRCLE 72 ON FREE INFO CARD

World Radio History

MASTER(ING) PIECES

dB Technologies dB3000

dB TECH dB3000

Simultaneous control over sample-rate conversion and data format parameters has been made a reality by dB Technologies' dB3000 Digital Optimizer, a digital audio processor for sample rate/data conversion, monitoring, and measurement. The 3000 features a converter that has 96k of algorithm coefficients. The Acoustic Bit Correction feature offers a dynamic range increase to 18–19 bits on 16-bit format. Selectable dither types range from flat, high-pass, triangular, and off. Retail price is $4350. For more details, contact dB Technologies, 8804 Spargur Loop Road, Bainbridge Island, WA 98110. Tel: 206-527-1948. Circle EQ free lit. #123.

CEDAR AUDIO DH-1

Get real-time without real noise with CEDAR Audio's DH-1, a rackmount device that removes broadband noise in real-time without using signal destructive filters and without the need for encoding/decoding. The DC-1 DeClicker, CR-1 Crackle Remover, and the AZ-1 Azimuth Corrector are all standard with the DH-1. For more details, contact Independent Audio, 295 Forest Ave., Suite 121, Portland, ME 04101-2000. Tel: 207-773-2424. Circle EQ free lit. #124.

SONY CDP-3100/CDS-3100

Sony's CDP-3100 (player)/CDS-3100 (remote) CD player system employs an 18-bit D/A conversion system with 8x oversampling and a linear power supply. Features like the JOG search function, END and BEGIN functions, Variable Speed Playback, Last Cue Memory, and Fader Start function make this a pair to be reckoned with in any professional studio. For more details, contact Sony Electronics, 3 Paragon Drive, Montvale, NJ 07656. Tel: 800-635-SONY. Circle EQ free lit. #125.

Sony CDP-3100 player and CDS-3100 remote

COREL CD CREATOR

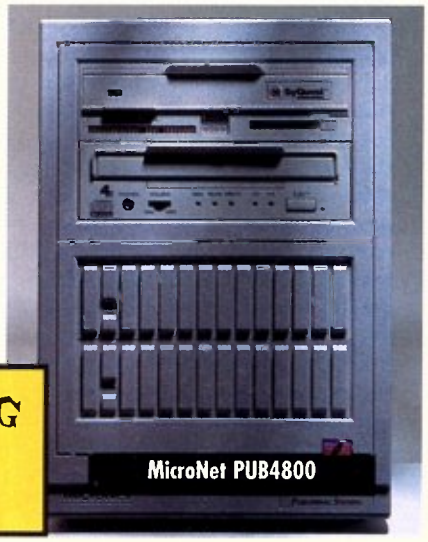
The Corel CD Creator records CD-ROM, CD audio, and mixed-mode discs in a few steps. Included in the CD Creator is a Disc Wizard that guides the user through the steps of the CD creating process, a .WAV file editor, and the mixed mode, which allows for both data and audio to be recorded on the same disc. To find out more, contact Apex NV, Bosdel 52, 3600 Genk, Belgium. Tel: 011-32-89-306-313. Circle EQ free lit. #126.

HIT LIST

Digidesign's MasterList CD Mastering Program provides users of Macintosh-based hard disk and recording and editing systems the ability to create fully Red Book-compatible, master-ready CDs. The CDs come with PQ-code encoding in a standard format that is accepted at duplication plants worldwide. MasterList CD creates a playlist of stereo soundfiles generated by any of Digidesign's hard disk recording systems. For details, contact Digidesign, 1360 Willow Rd., Menlo Park, CA 94025. Tel: 415-688-0600. Circle EQ free lit. #127.

MICRONET PUB4800

MicroNet's PUB4800 contains a Master CD Pro, a 200 MB SyQuest removable cartridge drive, and the 4 GB Raven disk array. This disk array provides transfer rates of up to 19 MB per seconds. To get more details, contact, MicroNet Tech, 80 Technology, Irvine, CA 92718. Tel: 714-453-6000. Circle EQ free lit. #128. EQ


MicroNet PUB4800

HERE ARE SOME MASTERING TOOLS FOR YOUR ARSENAL

World Radio History

World Radio History

LEXICON'S L

The successor to Lexicon's popular PCM 70 is put to the test. Find out if it belongs in your rack...

By Howard Massey

THE PCM 8 RE

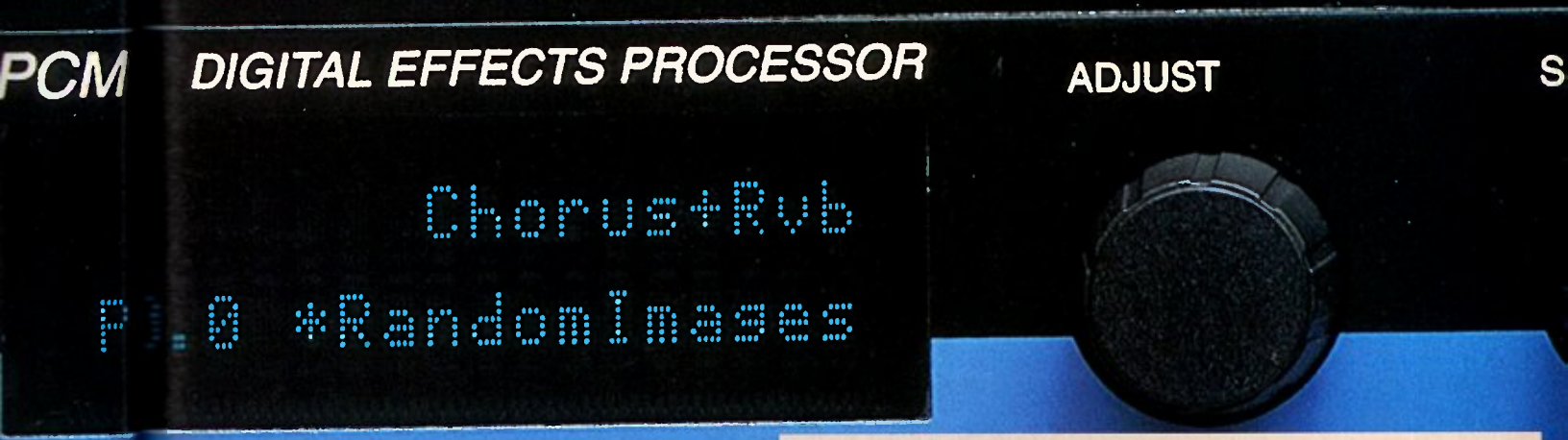
World Radio History

S LEGACY

's

o

Our story begins with the stupidest person ever hired by a well-known delivery company, which shall remain nameless but whose initials are UPS. My house, you see, has one actual entrance — complete with steps, door, and welcome mat — but it also, I'm ashamed to say, has an overgrown driveway leading to what may at one time have been a rear entrance (which was last used some time in 1936). Needless to say, this is where Mr. or Ms. Einstein chose to leave my long-awaited PCM 80 and Reflex review units. None of this would have any relevance to this review but for the fact that both sat out in the pouring rain for the better part of



BOREVIEW

MANUFACTURER: Lexicon, Inc., 100 Beaver Street, Waltham, MA 02154-8425. Tel: 617-736-0300.

APPLICATION: Multieffects processor.

STRENGTHS: Excellent sound quality, including lush reverbs, killer flanges, and ambiance/spatialization effects; digital input/output as well as balanced analog I/O; comprehensive MIDI features; software expandable.

WEAKNESSES: No pitch shifting, harmonization, or distortion effects; editing can be somewhat convoluted; no edit "recall" buffer.

PRICE: $2495 **EQ FREE LIT. #:** 129

World Radio History

LEXICON PCM 80 REVIEW

NEW & IMPROVED: Many new effect algorithms and enhanced MIDI control highlight the PCM 80's performance over its predecessor.

three weeks before I accidentally discovered them among the weeds one morning. Though the outer boxes were almost completely dissolved, I elected to give the units a couple of days drying out indoors before very gingerly plugging them in and hitting the power button. To my happy surprise, they both worked perfectly — which is more than can be said for the delivery person. Indisputable proof that Lexicon is the Timex of the '90s — give their products a licking and they keep on ticking!

The PCM 80 is the successor to Lexicon's ever-popular PCM 70, even though, at the time of this writing, the 70 continues to be manufactured. At the same list price as the PCM 70, it adds a slew of improvements, including a number of new effects algorithms, friendlier editing procedures, enhanced MIDI control, and improved audio specs. Still present are those great Lexicon reverbs (Hall, Plate, Chamber, Inverse, and Infinite), which are remarkably warm even when tailing off, exhibiting none of the graininess present in many other digital reverbs. In direct A/B listening tests, I found the sound of the PCM 80 to be smoother and less "in your face" than that of the PCM 70, and I found this subtlety to be pleasing, though I can see how the PCM 70 might still be preferable for some applications.

QUITE EFFECTIVE

But the PCM 80 is much more than just a reverb unit. With the notable exceptions of pitch shifting, harmonization, and distortion, you'll find pretty much every other kind of effect here. Among the 200 excellent factory presets are chorusing, flanging, digital delays, rotary speakers, filtering/equalization, vocal eliminators, autopanning, ambiance/spatialization, tremolo, vibrato, and resonant chord effects. There's also a "freeze" function that allows the PCM 80 to be used as an on-the-fly sampler (out of the box, you can capture up to 5 seconds of material — expandable to up to 42 seconds with the addition of standard SIMMs). Of particular note are the flanging effects (which provide the kind of deep, "killer" sweeps I'm a sucker for); the strikingly realistic ambiance/spatialization effects (which can be made compatible with Dolby Surround); and the resonant chord effects, which enable the creation of spooky, electronic sounds from everyday signal sources.

Any of these presets can be tweaked to your heart's content and stored in 50 user "Registers." There are three different editing levels provided: First, each preset has one or more parameters factory-assigned to the front-panel Adjust control so that simply turning this one knob will alter the effect in some useful way (the "Adjust" assignments themselves can be edited if desired). Second, each preset has up to ten significant parameters factory-assigned to a "Soft" row. When the PCM 80 is set to what is called "Go" mode (the factory default), only these ten parameters will appear ready for tweaking when you press the front-panel Edit button (again, the "Soft" assignments themselves are editable). Finally, if you really want to roll up your sleeves and dig into the guts of an effect, you can place the PCM 80 into "Pro" mode, where all available parameters (typically 50 or more) will be accessible for editing. My only complaint here is that a number of parameter screens provide subparameters, which are accessed by pressing the "Load" button — something I found less than intuitive. A dedicated Compare button allows you to instantly switch back and forth between the original preset and your edited one, and storage is simple and straightforward.

One feature I really like is that you are always offered the next empty ("Available") Register (assuming one exists) for storage, thus saving you from having to manually scroll through your Registers in order to locate an empty one. On the down side, there is no edit "recall" buffer, so there is no way to bring back your tweaks if you forget to store them before loading another preset.

ANALOG AND DIGITAL

One of the PCM 80's most advanced features is its ability to input and output stereo S/PDIF digital signal

SPEC STORY

- 200 presets ("Programs")
- 50 user memory slots ("Registers")
- Software updates and additional data storage via PCMCIA card
- Delay/freeze memory expandable from 5 seconds to up to 42 seconds (stereo) via standard 30-pin SIMMs
- Stereo input/output
- Balanced analog I/O (1/4-inch TRS); –10/+4 rear-panel switch
- S/PDIF digital I/O (coaxial RCA)
- AES digital input recognized
- External control inputs (one expression pedal input and one dual-switch input)
- 18-bit A/D and D/A conversion
- Internal power supply (3-pin grounded AC)
- Frequency response: 10 Hz to 20 kHz ±0.5 dB
- S/N Ratio (20 kHz bandwidth): 90–100 dB
- THD (10 Hz to 20 kHz): 0.004% (A/D); 0.006% (D/A); 0.008% (A/A)

World Radio History

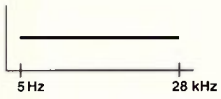
Two new Studiophones. Two different curves.

Two good reasons to retire your monitor 'phones.

Two high-performance acoustic designs

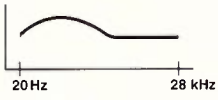
Great headphones need to be comfortable and reliable, but not everyone prefers the same sound.

ATH-M40



"Exact Realism"

ATH-D40



"Lots of Bass"

That's why our two new closed-back Precision Studiophones offer different responses:

- **ATH-M40 with flat, extended response** for exact reproduction of the original mix.
- **ATH-D40 with enhanced low-frequency response** for extra punch from the bass and drums.

Power and precision

Both models provide the same 1,600 mW of power handling with high efficiency. And both maintain exceptional clarity and linearity, even at high SPLs.

Comfort and convenience

A-T Precision Studiophones provide superb comfort, plus rotating earpieces for one-ear listening and a single-exit cable.

The quality you need; the sound you want

Prove it to yourself. Compare your present 'phones to both new Precision Studiophones at your dealer. Or for more information, call, write or fax.

Audio-Technica U.S., Inc.,
1221 Commerce Drive, Stow, Ohio 44224
(216) 686-2600 Fax: (216) 686-0719

audio-technica.

CIRCLE 15 ON FREE INFO CARD

World Radio History

BACK TO THE FUTURE: The PCM 80 includes both analog and digital I/Os for whatever format you work in (or plan to work in).

audio
video
film
and
multimedia
education

- Accredited by ACCS/CT
- Financial Aid available to those who qualify
- Aggressive Job Placement Assistance

Since 1979, **Full Sail** Graduates have been building successful **careers** in the entertainment industry. Three vital factors contributed significantly: extensive **hands-on training**, instruction by **industry professionals**, and labs equipped with the **latest technology**. Today **Full Sail** is poised on the *cutting edge* of **interactive media** and the information highway. Launch your career in movies, television, interactive media and sound recordings at the internationally acclaimed **Full Sail Center for the Recording Arts**.

Full Sail Center for the Recording Arts
3300 University Boulevard
Winter Park (Orlando), FL 32792

(800) CAN-ROCK

CIRCLE 84 ON FREE INFO CARD

(incoming stereo AES digital signal can be recognized also), as well as analog signal. What's more, both signals can be processed simultaneously if required, with the input level of each independently set. The provision of digital I/O should be of interest to anyone working with hard disk recording or multitrack digital tape systems. In practice, I found the onboard 18-bit D/A and A/D conversion to be so accurate that there was almost no difference between analog or digital input or output signal — the audio is clean as a whistle either way.

Although the current software (1.0) does not allow left and right input signals to be independently routed to different effects, this will be remedied soon with Lexicon's impending release of a Dual FX Algorithm Card. This PCMCIA card will add 25 reverb/effects combinations that can be used in series (reverb into effects or effects into reverb) or in parallel, as well as an internal submixer to control send and return levels within each algorithm. What's more, these routings, will be continuously variable, allowing you to create effects "morphing," similar to those provided by the Lexicon Vortex.

MIDI MACHINE

The PCM 80 also provides superb MIDI implementation. Almost any MIDI message you can think of can be "patched" to most editable effects parameters — and up to 10 of these patches can be assigned in each preset. Tempo can be controlled via incoming MIDI clocks (making it easy to synchronize delays with a MIDI sequence — even one with tempo changes) or by simply tapping the front-panel Tap button in rhythm (you can also set absolute tempo times or echo/beat tempo ratios). Incoming bank select

World Radio History

$20 OUT OF THE BLUE!

$20 REBATES ON SHURE BETA MICROPHONES.

FROM MARCH 1st THROUGH APRIL 30th 1995.

Shure Beta microphones have become the microphones of choice for performers who want the best in sound reproduction. And now, out of the blue, you can earn a $20 rebate on Beta 57, Beta 58 and Beta 87 microphones. So, you get premium quality sound and money back. That should leave you sky high!

SHURE'S "OUT OF THE BLUE" REBATES:

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

*Name*_____

*Address*_____

*City*_____ *State*_____ *Zip*_____

*Phone*_____/_____

*Qty. purchased: Beta 58*_____ *Beta 57*_____ *Beta 87*_____

*Age*_____ *Occupation*_____

Rebate applies to Models Beta 58MR, Beta 57MR and Beta 87 only. Wireless versions not included. Rebates are limited to a maximum of four per customer, household, family, or organization. Offer valid only on consumer purchases made at retail between March 1, 1995 and April 30, 1995. Rebate claim forms must be postmarked no later than May 31, 1995. This is a consumer (end user) offer only. Shure microphone distributors, retailers, their employees or their families are not eligible for rebates, nor may Shure microphone distributors, retailers, their employees or their families claim rebates on behalf of consumers (end users). Rebate requests not including proper documentation (official coupon, actual black model number label (no substitutions) from end of carton, and dated sales receipt with retailer's name) will be ineligible. Shure is not responsible for late, lost, or misdirected mail; insured or certified mail is recommended. Offer good only on purchases made in the U.S.A. and open to U.S. residents only. Void where taxed or prohibited by law. Allow 6 to 8 weeks for delivery of rebate check. Coupon face value 1/4¢. Rebate eligibility as determined by Shure is final.

SHURE®

CIRCLE 79 ON FREE INFO CARD

World Radio History

CONTACT CLEANERS ARE NOT CREATED EQUAL

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.

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 (1-10 years) 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	Federal Express	Honeywell	Switchcraft
Boeing	General Electric	McIntosh Labs	Tektronix
Diebold Inc.	John Fluke Mfg.	Motorola	Texas Inst.
Dolby Lab.	Hewlett Packard	Nakamichi	Xerox Corp.

CAIG LABORATORIES, INC.
16744 West Bernardo Drive, San Diego, CA 92127-1904
TEL: (619) 451-1799, FAX: (619) 451-2799

1-800-CAIG-123

CIRCLE 88 ON FREE INFO CARD

PCM 80 REVIEW

and program change messages can be used to call up presets (or Registers) and two user-specified MIDI maps are provided. In live performance, MIDI program change messages can be used to call up any of ten "chains," with each containing links of up to ten presets/Registers. You can then step through each link in the chain using any MIDI controller or with a footswitch connected to the PCM 80 rear panel. Finally, MIDI sys ex support allows for data dumping to external storage devices and enables control from MIDI patch editors.

Big studio or small, the PCM 80 is a worthy addition to anyone's effects rack. Its versatility and superb sound definitely put it on my top ten list of signal processors I'd most like to be stranded on a desert island with!

Howard Massey heads up On The Right Wavelength, a MIDI consulting company, as well as Workaday World Productions, a full-service music production studio. He is not related to John Cameron Swayze.

LEXICON REFLEX

For about one-fifth the cost of a PCM 80 ($499), this remarkable unit delivers many of the renowned Lexicon reverbs along with excellent flanging, chorusing, delay, and resonator effects. Sixteen factory presets are provided along with another 128 user "Registers" (filled with 96 more factory effects), and all of them sound good, with more than a few coming close to the quality of top-level signal processors.

If you want to dig in and tweak these presets, a certain amount of editing power is provided. Three parameters (Decay, Delay, and FX Level) can be instantly altered from the front panel, while an additional 7–10 parameters can be accessed by entering an "advanced programming mode" (Reflex is also compatible with all LXP-1 editor/librarians). A rear-panel footswitch can be used to step through registers and a user-specified register chain can be programmed. MIDI controllers can be used for real-time control of up to four parameters in each preset/register, and delay tempo can be slaved to MIDI clocks; there is also provision for external sysex data dump.

Admittedly, Reflex's user interface leaves a bit to be desired, as programming often requires two buttons to be held down simultaneously or a button to be held down with one hand while a knob is moved with another, but this seems to be a small price to pay for so much power in such an affordable unit. If you're on a limited budget, it's hard to see how you can get better bang for your buck.

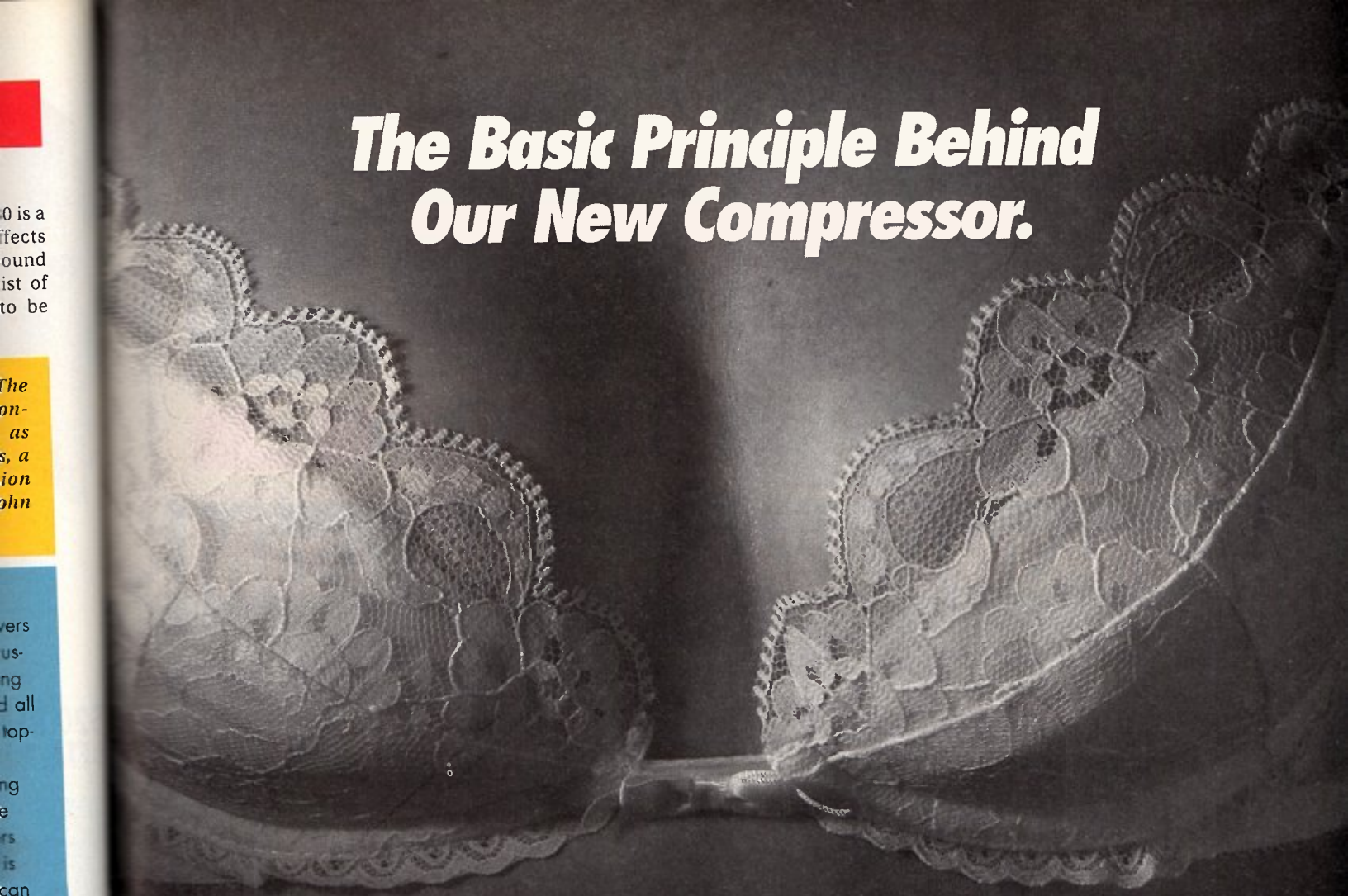
Just the Specs

- 16 presets; 128 user memory slots ("Registers")
- Unbalanced analog (1/4-inch) stereo input/output
- 9 VAC "wall wart"
- A/D conversion: 16-bit linear
- Frequency response: 20 Hz to 20 kHz ±0.5 dB
- Dynamic range (20 kHz bandwidth): 85 dB
- THD + N: 0.025%

—Howard Massey

World Radio History

The Basic Principle Behind Our New Compressor.



The Wonderbra® and our new 488 DYNA-Squeeze™ Compressor/Interface were designed to perform the same, remarkable feat: To gently squeeze and push up.

While the result of the Wonderbra is strictly visual, the effect of the DYNA-Squeeze is purely audible. And that's where this seemingly ridiculous comparison ends.

With the eight channel DYNA-Squeeze connected between your console and digital recorder, critical gain riding instantly becomes a faded memory. Now you can get back to recording hot, just like the good old analog days.

And by gently pushing more sound into the upper end of your recorder's dynamic range, DYNA-Squeeze lets you maximize resolution, while simultaneously minimizing low level distortion.

To get your hands on a DYNA-Squeeze, ring us toll-free at 1-800-288-8855.

At $579, it may not improve your looks, but we guarantee it'll do wonders for your sound.

Symetrix

Wonderbra is a registered trademark of Canadelle, Inc.

CIRCLE 63 ON FREE INFO CARD

World Radio History

WE'VE BEEN PIONEERING AMPLIFIER TECHNOLOGY FOR OVER TEN YEARS.

BUT DON'T TAKE OUR WORD FOR IT.

Since 1984, when Stewart Electronics manufactured the first amplifiers with our efficient, lightweight, power supplies, our competitors, using old technology, have insisted that our approach would not work.

Ten years and over 600,000 amplifiers later, we've proven this technology world wide.

Currently every one of our major competitors has introduced, or is working on, lightweight amplifiers using our Award winning High-Speed Switching Power Supply Technology (patent pending).

The Stewart PA-1400 has been awarded the 1994 TEC Award for outstanding technical achievement in amplifier technology.

Coupled with features like **Harmonic Shift Correction**™ for unparalleled sound quality (another Stewart first), **7 stage Circuitguard protection**, real 2 ohm stability, 21 step precision attenuators, and a **Full Five Year Warranty**, the Stewart Amplifier Line is not just the best, but the only choice.

The Stewart PA-Series includes the PA-500, PA-1000, PA-1400, and the remarkable PA-1800.

For the location of the Stewart Professional Audio Dealer nearest you, and our complete product information kit, call us at 1-800-316-7626.

PA-500	110w x 2 @ 8Ω
1 rack space	190w x 2 @ 4Ω
10lbs.	275w x 2 @ 2Ω
PA-1000	225w x 2 @ 8Ω
1 rack space	420w x 2 @ 4Ω
11 lbs.	580w x 2 @ 2Ω
PA-1400	390w x 2 @ 8Ω
2 rack space	650w x 2 @ 4Ω
16 lbs.	880w x 2 @ 2Ω
	1400w @ 4Ω bridged
PA-1800	450w x 2 @ 8Ω
2 rack space	775w x 2 @ 4Ω
17 lbs.	1050w x 2 @ 2Ω
	1800w @ 4Ω bridged

Stewart ELECTRONICS

Handcrafted in **USA**

©1995 Stewart Electronics

11460 Sunrise Gold Circle • Rancho Cordova, CA 95742 • Phone1-800-316-7626

CIRCLE 66 ON FREE INFO CARD

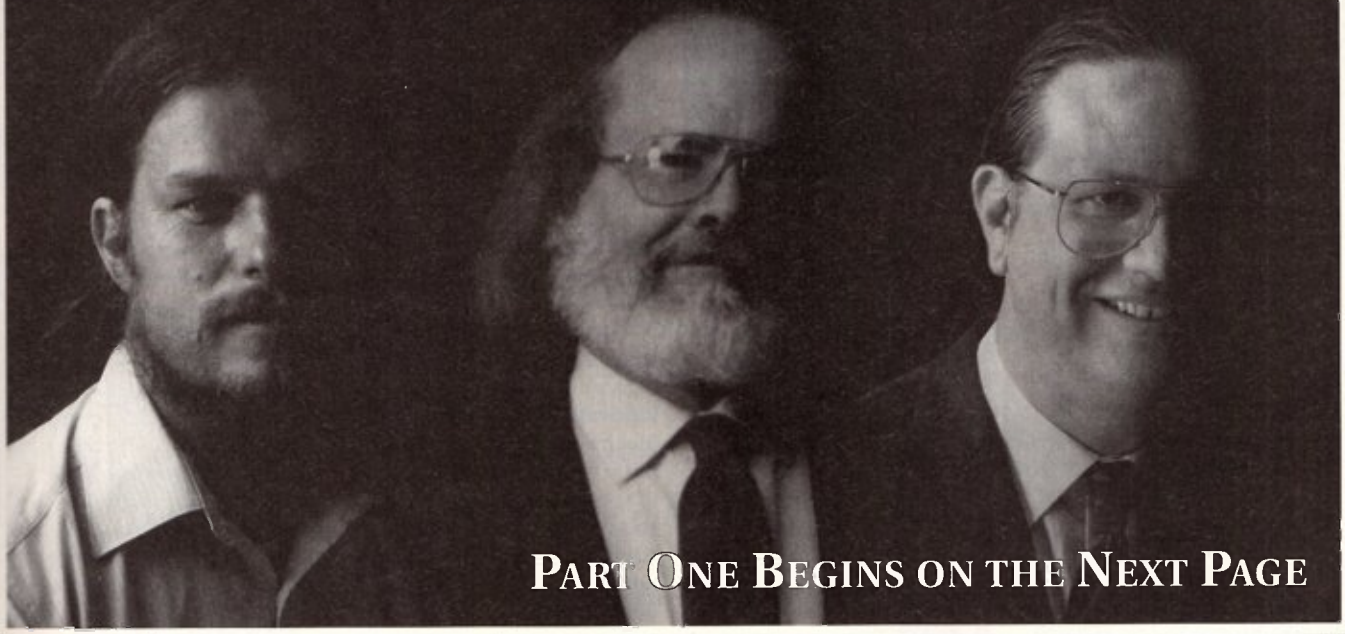
World Radio History

EQ LIVE

New Gear For Your Next Gig

Page 102

Meet the Speaker Tweaks



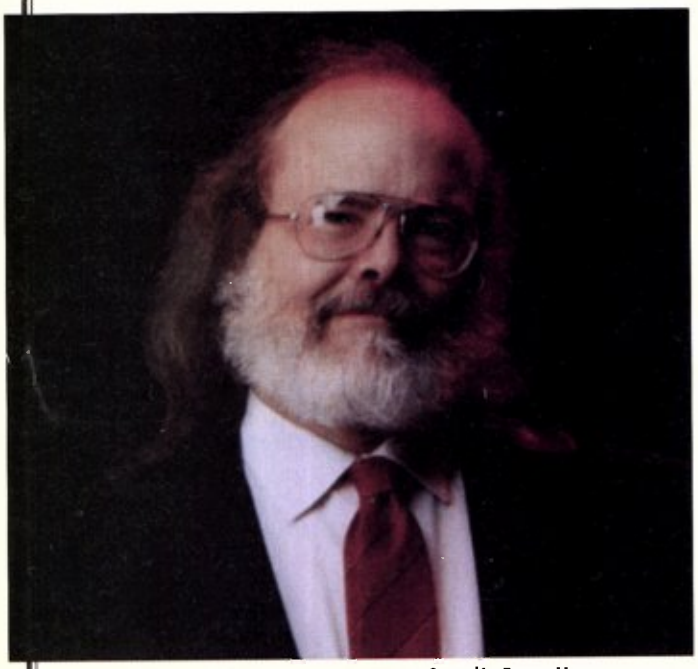
Part One Begins on the Next Page

CIRCLE 21 ON FREE INFO CARD

World Radio History

EQ LIVE

THE UNSUNG HEROES OF LIVE SOUND



COMMUNITY SERVICE: Community Sound's Bruce Howze

AT SOME POINT or another — and we don't think we're going out on a limb here — every person in the pro-audio field will use a loudspeaker. And we are all aware of how to use loudspeakers and of the companies that manufacture them. But what about the people who design these things? What about those who gut it out in a lab refining his or her design until it is ready for all the world to hear? These people are the Unsung Heroes of Live Sound. *EQ* spoke to several heavyweights in loudspeaker design to get their perspective on how the art is evolving and how it will develop in the coming years.

BRUCE HOWZE/ COMMUNITY SOUND

As the founder and president of Community Light & Sound, Bruce Howze is one of the most respected designers in the loudspeaker field. Howze started Community in 1967 when he began designing custom lighting control systems. Today Community is one of the few manufacturers capable of taking a design from the drawing board to the demo room totally in-house. Howze's designs, all made in Community's factory, include loudspeakers, loudspeaker systems, fiberglass horns and components, and all related electronics. Howze will be a guest instructor at the Synergetic Audio Concepts workshop, "The Theory and Design of High Performance Professional Loudspeakers" to be held June 22–24 in Nashville, Tennessee.

Howze relates his start in the SR industry: "In the late 1960s, when I was out touring as an engineer, there really was no touring sound industry. Most bands were playing large clubs (2–3000 capacity) that demanded big PA's, but basically there were none. Some people took cinema systems out on tour, but these systems were designed to be installed and left in place. I saw the need for movable loudspeaker systems for the touring industry so I started Community Light & Sound."

When asked about the use of new materials and technology to produce loudspeakers, Howze notes that he doesn't feel that there have been any real innovations or revolutions in loudspeaker design, but that many refinements can be made in design efficiency and in the materials used — particularly in diaphragm material. Howze mentions carbon fiber as a new material that Community is working with more frequently due to its high stiffness-to-weight ratio. Community has a long history of using fiberglass, not only in its horns but also in the complex faceplates of its larger touring cabinets. These innovative designs allow the one-piece molded faceplate to support high-, mid-, and low-frequency horns with equal path-lengths from the loudspeakers.

Howze identifies one trend that he sees in the touring sound reinforcement industry: "The full-range cabinet has definitely become more widespread. You used to see a stack of woofers, a stack of mid-packs, and a stack of tweeter horns on top, but that is gone now. It was difficult to array. Full-range systems are easier to move, connect, and fly but still offer most of the advantages of separates. The only exception is the subwoofer, purely due to the physical nature of low-frequency sound. It is not practical to put the subwoofer in the same cabinet — it's too big and too difficult to fly. I see the future of the industry as a continuation of the present with continued growth in the MI, touring, and contracting markets."

JOHN MEYER/MEYER SOUND

John Meyer became involved in audio in the 1960s when he studied engineering at the Heald Institute of Technology and worked for Berkeley Custom Electronics. While working with that company, John consulted for the Steve Miller Band, and it was then that he identified problems with prevailing low-frequency horn-enclosure designs. Meyer was able to show that some systems of that period suffered by not excluding input signals below the horn's design cutoff frequency (this uncontrolled low-frequency energy could literally tear the driver cones apart because the horn did not provide an acoustical load at those frequencies). He later designed loudspeaker systems for Harry McCune Sound Service and was invited to consult for the Institute For Advanced Musical Studies in Switzerland on an extensive research program involving audio transducers (this work would yield Meyer his first patent for a high-frequency horn design that dramatically reduced horn throat distortion). As the founder and chairman of Meyer Sound, John has been granted a patent for the trapezoidal loudspeaker enclosure and has earned TEC awards for his Source Independent Measurement (SIM) technique and his HD-1 High Definition Audio monitor.

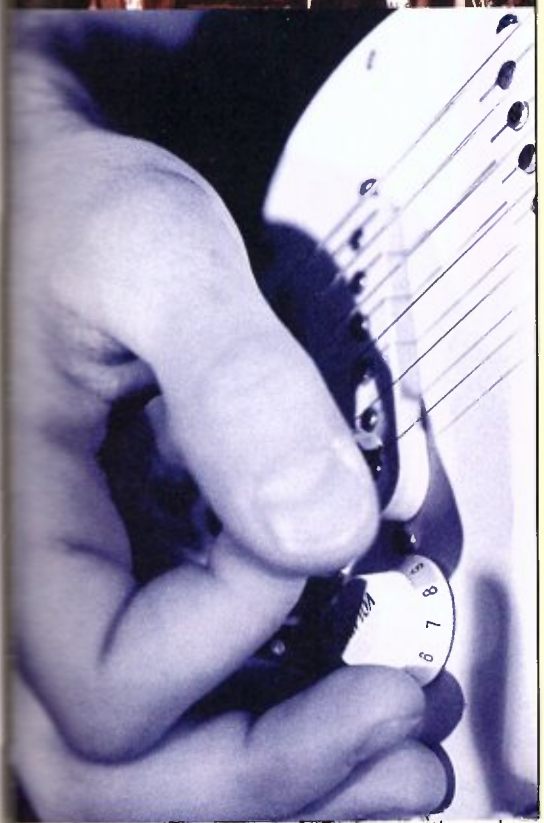
In 1969, Meyer left Berkeley Custom Electronics to form

PART ONE: IF YOU'VE EVER USED A SPEAKER — AND WE KNOW YOU HAVE — THESE ARE THE PEOPLE TO THANK

BY STEVE LA CERRA

World Radio History

NO ONE COULD HEAR YOUR SOUND THE WAY YOU DO



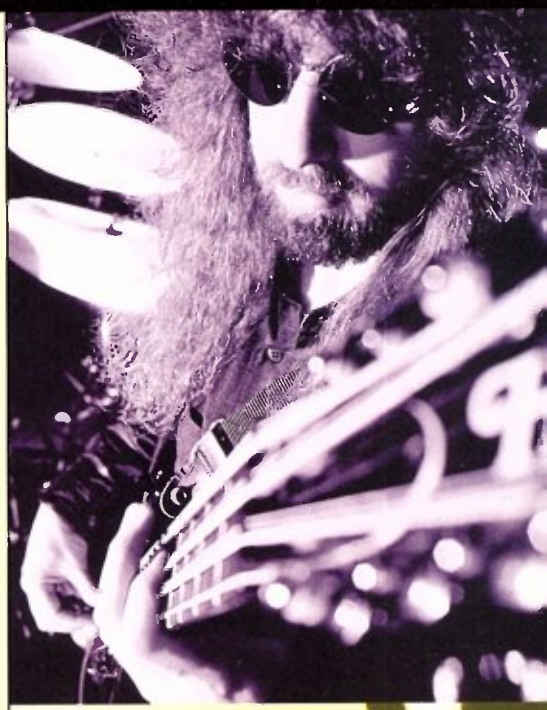
EVERY CROWD MAKES THE SAME NOISE. EVERY INDIVIDUAL HAS A UNIQUE, UNREPEATABLE SOUND.

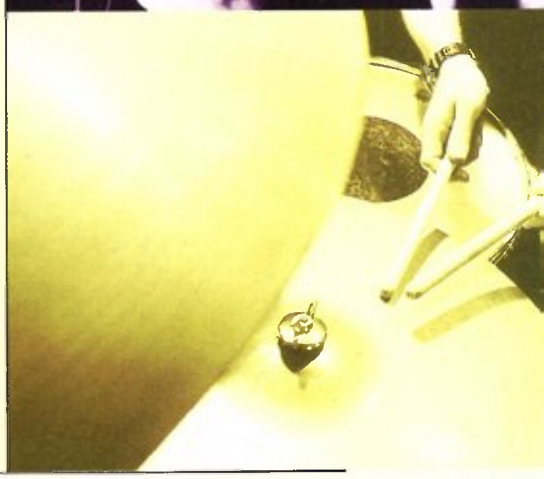
IT MIGHT BE A NEW SAMPLE YOU SPENT ALL NIGHT TWEAKING. A GUITAR TONE THAT COMES OUT OF YOUR SOUL, NOT OUT OF A BOX. A VOICE THAT'S UNMISTAKABLY YOUR OWN. IT MIGHT BE WHATEVER IT IS THAT HAPPENS WHEN A BAND FALLS TOGETHER.

IT TAKES A SPECIAL KIND OF DEDICATION TO FIND YOUR OWN SOUND. A SPECIAL KIND OF GUTS TO STAND UP AND MAKE THAT SOUND IN FRONT OF A CROWD. BUT NO MATTER HOW MUCH YOU PUT INTO YOUR SOUND, YOUR PA HAS BEEN PUTTING OUT THE SAME OLD NOISE.

LA

Performance Audio Redefined





music. Ultimately in 1979, I through a show was 50 per-

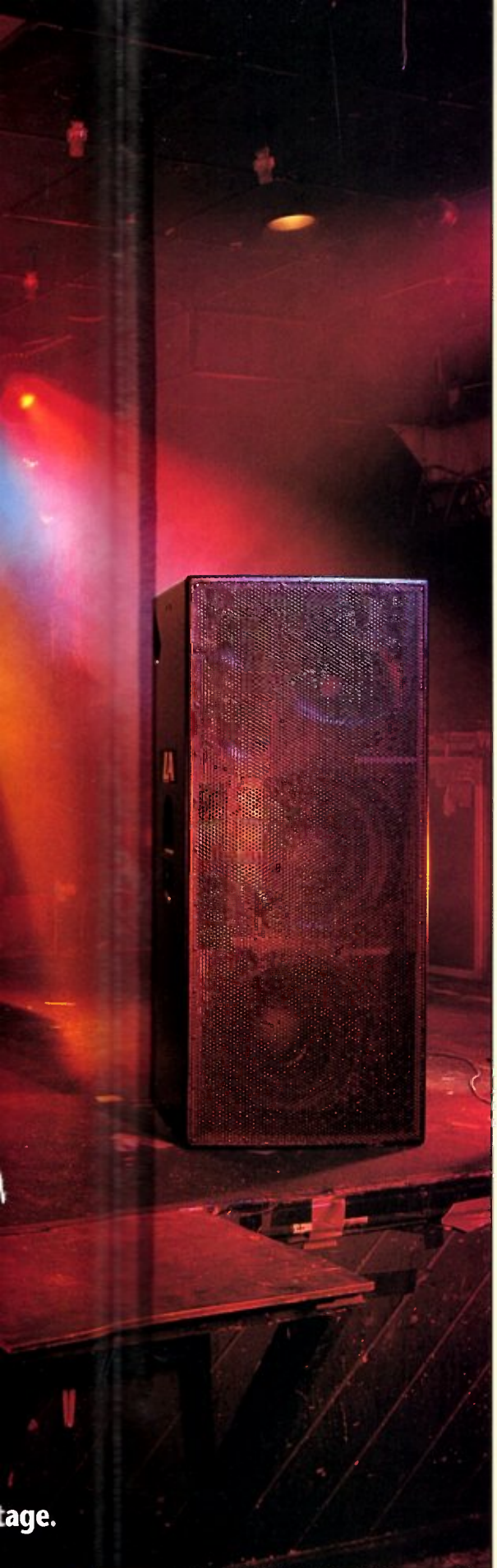
CIRCLE 73 ON FREE INFO CARD

World Radio History

the few manufacturers capable of taking a design from

so I started Community Light & Sound."

World Radio History



Welcome to LA

Linear Activation: The Next Stage In Sound Reinforcement

Linear Activation is an advanced approach to speaker design that draws on years of experience with professional touring systems. When you're ready to stand out from the crowd, the LA Series of Linear Activation loudspeaker systems is engineered to take you beyond the same old noise, to something no one else has ever really heard: your own sound.

Until now, the only place you could really hear the details that define your individual sound was the studio "sweet spot." The LA Series delivers studio monitor clarity to the entire audience. That's because the Linear Activation design process optimizes each LA Series system's total acoustic output to put high definition, high impact sound everywhere you want it. Simple idea. Took us over a year to make it a reality. There's a lot of our soul in these boxes – let us take you on a tour.

The LA325's dual 6.5 in. cones are specially treated to dampen spurious resonances. We mount them in a line array subenclosure to direct acoustic energy away from ceilings and floors. This separate midrange system delivers the character of voices and instruments without the distortion that makes ordinary PA speakers sound harsh or "mushy."

Why is this crossover so complex that it took a computer program to help design it? Because integrating five high performance transducers into a single acoustical unit is not as simple as wiring up a couple of capacitors and inductors.

You've seen waveguides on high end studio nearfields, but no one has ever seen anything like this: our Elliptic Conical Waveguide™. It works with the LA325's 2-in exit compression driver (like the ones in our large touring systems) to project high definition upper octave detail in live sound nearfield applications (15 to 65 feet).

LA

Performance Audio Redefined

CIRCLE 73 ON FREE INFO CARD

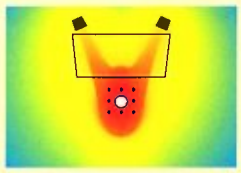
World Radio History

LINEAR ACTIVATION: A NEW APPROACH TO LOUDSPEAKER DESIGN

Any PA can fill a room with noise. The goal of Linear Activation design is to fill the space with high definition, detailed, studio monitor quality sound. Linear Activation design concepts apply the lessons learned in years of professional touring sound reinforcement to "near field" sound reinforcement applications.

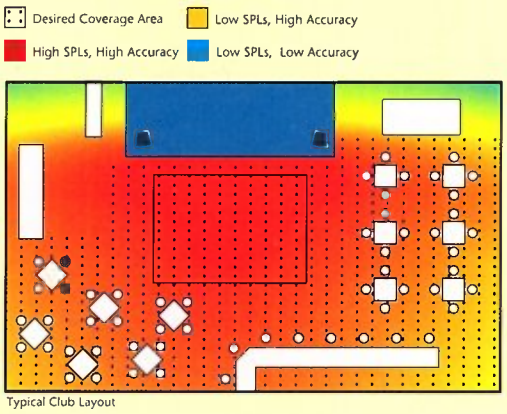
THE NEAR FIELD: TWO DEFINITIONS

In the studio, "nearfield" means a spot where the direct output from the loudspeakers is the only factor determining sound quality. Room reflections arrive so late and are so much softer than the direct sound that they play no part in the listening experience. Studio nearfields are designed to operate at a distance of 1 – 4m (three to fifteen feet) and provide a reference to one or two listeners. Because the coverage area is so small (about one square foot, the size of the average human head) and reflected sound is not a factor, the only essential requirement for speakers of this type is flat on-axis frequency response. This can achieved through the use of active or passive equalization. High SPL output capability is not required, since the listening distance is so short.



Studio monitors provide an accurate reference – but only in a small "sweet spot" a few feet away from the speakers and directly on axis to both of them.

Typical Recording Studio Layout



Typical Club Layout

Linear Activation loudspeaker systems are designed to project "studio monitor" definition, detail and dynamics, but over a broadly defined coverage area that encompasses the whole audience.

In typical live sound reinforcement applications such as clubs, corporate presentations, or worship services, "nearfield" means the entire listening area within roughly 15 – 65 feet from the loudspeakers. Much of the audience will actually be closer to the side or rear walls than to the speakers, so the reverberant field is a major part of the sound. The coverage area is hundreds or even thousands of square feet – extremely high output capability is required to provide "adequate" levels throughout such a space. Sound quality should be consistent throughout, so that all listeners can hear and appreciate the performance. When the reverberant field is very different in tonal balance from the direct sound, the ear is confused, intelligibility is low and the sound quality is perceived as "hollow" or "harsh." Hours of tweaking with equalizers cannot solve this problem, because equalizers cannot change the dispersion and coverage angles of the loudspeaker system.

TOTAL ACOUSTIC OUTPUT

Linear Activation design recognizes that it is the loudspeaker's total acoustic output that determines how it activates a given listening area. When total acoustic output is optimized, coverage is consistent, the spectral content of the reverberant field matches that of the direct sound field (as it would in an unamplified performance) and every member of the audience can have a satisfying listening experience.

One of the keys to Linear Activation design is the requirement that the dispersion angle as well as the on axis amplitude remain consistent throughout the frequency range. Consistent coverage angle must be designed into the system from the beginning – it cannot be added later with equalizers.

In the course of optimizing the total acoustic output of the new LA Series of Linear Activation systems, EAW engineers have developed innovations such as the Elliptic Conical Waveguide used to control high frequency dispersion. But these new technologies are only useful because they are integrated into professional loudspeaker systems that produce Linear Activation of a small to medium size venue.

CALL 800/992-5013 for a free copy of The LA Story: From the Concert Stage to the Next Stage.

Linear Activation Loudspeaker Systems by Eastern Acoustic Works, One Main Street, Whitinsville, MA 01588 Tel 508/234 6158 Fax 508/234-8251

the few manufacturers capable of taking a design from

so I started Community Light & Sound."

World Radio History

Meyer Sound's John Meyer

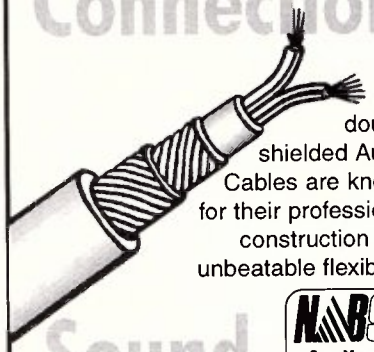
decided to start Meyer Sound "

In the late '60s and early '70s, Meyer and his associates began to recognize the need for sound reinforcement systems that could easily be moved. "When I went over to McCune's and worked with Creedence, I knew we would have to do a lot of shows and one-nighters. The one and two week-long setup times for some of these systems was totally inadequate in terms of cost. It was very expensive and accountants were coming in — bands wanted to start to make some money."

When asked about the use of new materials in loudspeaker construction, Meyer voices a strong opinion. "The materials and techniques don't really matter. What really matters is what you hear. There may be all kinds of techniques involved, but the materials don't really guarantee that it's going to sound good — they just are there for marketing. Paper is strong and light and makes a very good cone. It's hard to beat and treated properly it will last long time. We built a cone with balsa wood sandwiched between layers of carbon fiber and it behaved almost exactly like a paper cone. It makes more sense to try to build the sophistication into how you drive those parts. We have built some very good speakers with very good impulse response working around the inherent problems of drivers and cones and then correcting those problems electronically. That trend was barely possible in the '70s."

Meyer explains that 20 years ago the rate of getting through a show was 50 per-

his first independent company (Glyph) where he developed an all-horn PA system optimized for efficiency (this was important in a time when a 100-watt amplifier was considered high-powered). He comments, "At that time people were just starting to put together systems for large outdoor shows, and we built a sound system with our own 100-watt tube amps. We built a large system for a club called Pepperland with these eight-foot long exponential horns." Working with artists like Pink Floyd, Frank Zappa, and Joan Baez attracted a lot of attention for the up-and-coming speaker designer. Then in 1971, Meyer (with McCune Sound Service) built the JM-3, a full-range horn-loaded system with its own dedicated phase-corrected crossover. Meyer continues, "We performed a lot of experiments to reduce horn-throat distortion, and at The Institute For Advanced Musical Studies in Switzerland we spent a year (and millions of dollars) building 'next generation' systems for opera and classical music. Ultimately in 1979, I

Gotham
Superior Audio Cables
Sound Connection

Our double shielded Audio Cables are known for their professional construction and unbeatable flexibility.
NAB95 See You At BOOTH #4605
Sound Perfection
DELTRON
Superior Connectors
DGS PRO-AUDIO 800-292-2834
Deltron/Gotham Stateside US Sales & Stocking Warehouse
P.O. Box 170426, Arlington, TX 76003
CIRCLE 24 ON FREE INFO CARD

COMPACT DISC
AUDIO/VIDEO CASSETTE
CD ROM & CDI
DUPLICATION
At WMG, we offer the highest quality Compact Disc, Audio & Video Cassette, CD ROM & CDI duplication in the industry. Let us help you with the most professional and friendliest service to guide you and your project every step of the way.
Complete services include
DIGITAL MASTERING • GRAPHIC DESIGN • TOTAL PREPRESS
PRINTING • CUSTOM PACKAGING • SHIP ORDER FULFILLMENT
Our prices, quality product and service cannot be beat. All work guaranteed.
WMG, INC.
WORLD MEDIA GROUP
NAIRD NARM
8472 BROOKVILLE ROAD
INDIANAPOLIS, INDIANA 46239
317/353-1113 FAX 317/353-0750
CIRCLE 73 ON FREE INFO CARD

World Radio History

Soundscape

Digital • Audio • Workstations

"Soundscape seems to be a remarkably stable system in that I didn't experience a single glitch, crash, or hiccup during the entire review period. It's a credit to the developers that every operation worked smoothly and as advertised. That is not something you can take for granted."
Dennis Miller. ***Electronic Musician Nov '94***

"Soundscape is one of the few digital recorders that permits recording while chase locking without an expensive hardware add on to control it's sampling rate. The SSHDR1 currently provides the most cost effective solution for this application."
Jim Aikin. ***Keyboard Nov '94***

"The quality of the converters seems particularly high; I couldn't detect any coloration when comparing recorded material with the original. A lot of effort and care has been devoted to this crucial side of the system."
Dennis Miller. ***Electronic Musician Nov '94***

"Ever since the introduction of the DAT format, the world has looked for a replacement for the razorblade. Soundscape is a sharp, affordable replacement with extras."
Eddie Ciletti. ***EQ Feb '95***

"Everybody reported that their system had never crashed and that they had never found any bugs, not even on preliminary alpha or beta versions ..."
Paul Tingen. ***User review for Audio Media Dec '94***

"Soundscape does offer everything that you could want from a professional quality hard disk recording system ... it is cheaper, more powerful and more stable than many similar systems. But most of all it is so easy to use, allowing you to concentrate on the music."
Philip Moore. ***Australian Digital Mar '95***

"Having used Soundscape for three months in post producing audio for corporate programmes mastered on Betacam SP, it is now unthinkable to return to the old way of working ... Soundscape is reliable, simple to learn, easy to use and produces very high quality results."
Nic Blinston. ***Business Video Mar '95***

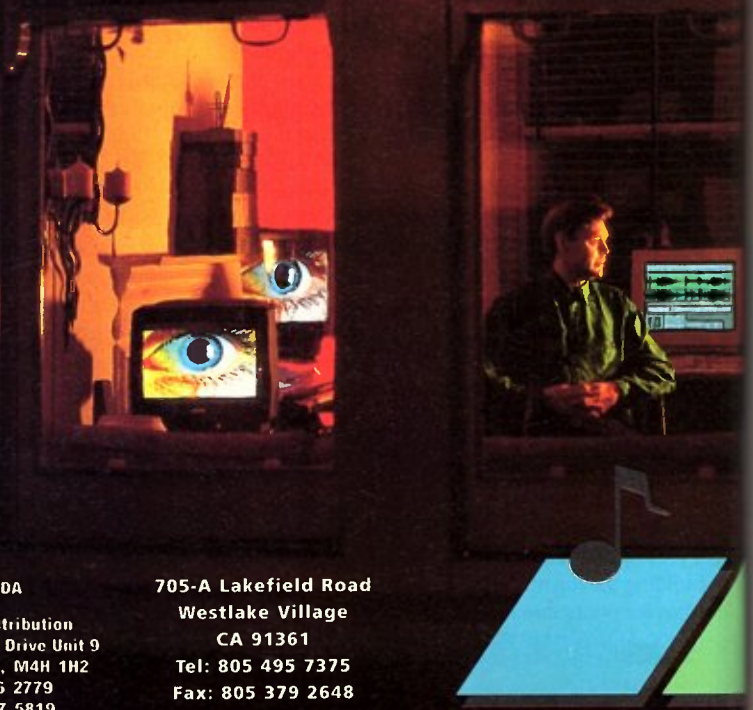
"Soundscape could well find it's way replacing the analog tape recor up and down the country ... a welcome addition to any studio set u for the sheer freedom it offers when it comes to laying tracks dow quickly and easily in order to make the most of that creative muse"
Bob Walder. ***Music Technology Jul '93***

"I've been playing around with Soundscape's hard disk recorder th week and feel almost as though I've had a religious experience."
Brian Heywood. ***MIDI Monitor Issue 11***

"I wanted to really check out the vari sync mode. I slowed the vide down to a crawl, Cubase locked in and the sequenced music was playing slowly ... a bit faster ... and ... yes the Soundscape synced u and was recording. The SSHDR1 has lots of features, creative usage available power, sounds great, syncs great, straightforward, easy to use and expandable."
John Zulaikha. ***Connections Feb '95***

"The next stage of the Digital Revolution starts here."
Bob Walder. ***Home and Studio Recording Jul '93***

Need we say more.



SSHDR1-R*

CIRCLE 89 ON FREE INFO CARD

* Unit shows NEW optional professional drive carriers

IN CANADA

Gerr Audio Distribution
2 Thorncliffe Park Drive Unit 9
Toronto, Ontario, M4H 1H2
Tel: 416 696 2779
Fax: 416 467 5819

705-A Lakefield Road
Westlake Village
CA 91361
Tel: 805 495 7375
Fax: 805 379 2648

SOUNDSCAPE DIGITAL TECHNOLOGY

World Radio History

cent. His goal was to create a situation similar to the one Sony created with its televisions — a very low failure rate. "It's the reliability that people care about. As we started to gain reliability, we could pursue high-Q systems. Even the first MSL-3 was a medium-Q system, 70-degrees wide. If you put two side by side and one went down, the other could cover most of the audience. We became very concerned with getting through every single show every single time. Then we spent the next 15 years learning how to make our speakers so reliable that you could have one high-Q speaker covering a single area and avoid multiple arrival times."

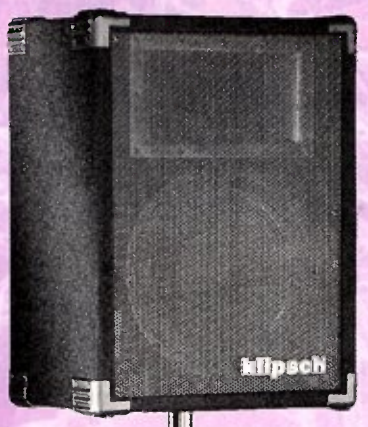
Meyer feels that the gear being manufactured these days does have an improved rate of reliability. "We have a return rate of less than one percent on our gear. We sell to remote locations and we don't want problems with warranty returns. Overall reliability has increased, and we experience fewer problems. We are not interested in repair. Some companies are into the spare parts business. They make it easy to recone and they don't care whether it's done right or not. Meyer Sound provides reliable, high-quality sound. Our group (the entire pro-audio industry) must look professional and not try to fool our customers. We are the technical people trying to bring the artist to the audience. That is our mission in the industry."

MARK GANDER/JBL

Mark Gander has been a member of the JBL family since 1976 when he started as a transducer engineer. Mark has held the positions of applications engineer, product manager, and vice president of engineering. He is currently JBL's vice president of strate-

continued on page 119

Stick Your Pole Into a "Stubby-Sub™"



Perfect for the working musician, Klipsch Professional packages the full-range KP-2000-C with the KP-1000-C-X "Stubby-Sub" to create a flexible system that delivers incredible fidelity and low-end punch at a surprisingly affordable price.

Mounted above the "Stubby-Sub", the KP-2000-C is a compact, two-way system that provides exceptional intelligibility. The low-frequency section accommodates a proprietary woofer for tight bass and reliability, while the Tractrix Wave™ horn delivers excellent high-frequency coverage even in the most difficult rooms.

Featuring a built-in crossover, the "Stubby-Sub" provides extended bass response from 150 Hz to below 40 Hz for chest-thumping low end. The optional KP-36-T pole allows easy mounting of the KP-2000 C and other Klipsch systems.

Check out the new Klipsch "Killer Combo" at your local dealer and experience the legendary Klipsch sound.

- High efficiency
- High output
- Earth shaking low-end
- Built-in crossover in Stubby-Sub
- Rugged construction
- Heavy-duty carpet covering
- Recessed handles
- KliP™ protection circuitry
- Locking 1/4" Neutrik™ connectors
- Fully transferable five-year warranty

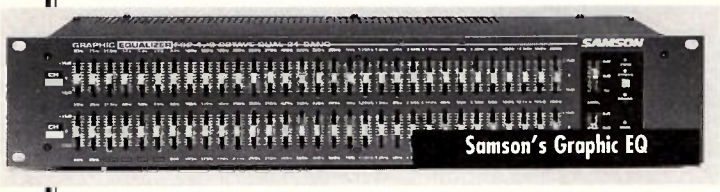
klipsch®
PROFESSIONAL

149 N. Industrial Park Rd. • Hope, AR 71081
(501) 777-0693 • FAX (501) 777-0593

CIRCLE 45 ON FREE INFO CARD

World Radio History

New Gear For Your Next Gig



Samson's Graphic EQ

Two EQ

Samson Audio has released two new graphic equalizers, the E62 and the E30. The E62 is a 1/3-octave stereo 31-band graphic EQ that offers features such as two hard-relay bypass switches, independent left and right output level controls, dual-peak overload indicators, balanced XLR inputs/outputs, and balanced TRS inputs and outputs throughout. Each of the 62 faders feature ±15 dB of boost or cut. The E30 is a 1/2-octave stereo 15-band graphic EQ that offers 15 dB of cut and boost for each of the 30 faders. Other key features include an internal power supply, parallel filter design, and fail safe relay as protection against loss of power. The E30 is housed in a 1U chassis and the E62 is housed in a 2U chassis. Retail prices are $349.99 and $299.99, respectively. For more information, contact Samson Technologies Corp., P.O. Box 9031, Syosset, NY 11791-9031. Tel: 516-364-2244. Circle EQ free lit. #130.

Take DAT With You

TASCAM once again proves that you can take it with you with the DA-P1 portable DAT recorder. The DA-P1 is one of the few portable DATs on the market that offers a two-head design and two direct-drive motors. Also included are XLR-type mic/line inputs complete with phantom power, which are designed to accept a broad range of signal levels from –60 to +4 dBm. The DA-P1 also offers unbalanced RCA connectors for both input and output and S/PDIF digital I/O for direct digital transfers. Also on board are next-generation A/D and D/A converters, as well as support for multiple sample rates — 48 kHz, 44.1 kHz, and 32 kHz, and SCMS-free recording. The DA-P1 features a mic limiter and a 20 dB pad to cut out outside disturbances. Battery operation lasts for two hours, and recharges in one and a half hours. For more information, contact TASCAM, 7733 Telegraph Rd., Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #131.

TASCAM DA-P1

Telex Like It Is

Operating 50 simultaneous systems without compromising operating range or audio quality? That's what Telex is proposing with their new FMR-450, a professional UHF wireless microphone system. The new system operates from 524 MHz to 746 MHz (UHF TV channels 23–60) and is designed to operate up to 50 simultaneous systems using handheld or belt-pack transmitters. Included on the FMR-450 is the patented Pos-i-Phase true diversity. Telex has also incorporated their Pos-i-Squelch II, which addresses system quieting. There's a new design for the compander, and the signal-to-noise ratio is greater than 110 dB. Other features include a 1/2-wave collinear ground independent antenna system, a receiver that features RF, audio, and diversity LED indicators, and a transformer-isolated balanced mic level output with attenuation control. The receiver measures one-half rack space wide by one rack space high. The transmitter has a new sculpted silent-on switch and separate mic mute, overload/low battery LED, removable antenna, and gold-plated LEMO mic connector. The transmitter can operate for 12–14 hours on a standard 9-volt alkaline battery. For more information, contact Telex Communications, Inc., 9600 Aldrich Ave., South, Minneapolis, MN 55420. Tel: 612-884-4051. Circle EQ free lit. #132.

Telex FMR-450

Re-Gain Control

Gefen Systems is offering the AGC100 Automatic Gain Control. Each input channel offers a recessed volume control and four LED indicators. Signal levels begin at –40 dB, with the next reference at –10 dB, followed by 0 dB, and a peak level set at +10 dB. The AGC circuit allows the threshold of the master output to be set as required. The threshold output level can be set from a range of –30 dB to +15 dB. The master offers recessed level control and four LED indicators, starting at –10 dB with the next reference at –3 dB, followed by 0 dB and the peak level at +10 dB. Gefen Systems has included a remote master volume control using a modular jack with a range of 2500 feet. To get more details, contact Gefen Systems, 6261 Variel Ave., Suite C, Woodland Hills, CA 91367. Tel: 800-545-6900. Circle EQ free lit. #133.

World Radio History

Precision Series™ Power Amplifiers

1400 W into 4 ohms

900 W into 4 ohms

550 W into 4 ohms

Dynamic Signal Processing™

The Electro-Voice Precision Series™ power amplifiers were engineered to maximize the performance of the best, most powerful speaker systems in the world—our own.

So we didn't compromise.

Precision Series™ amplifiers feature the most innovative performance and protection circuitry available.

And they're built to last...long after other amps have been recycled.

To ensure this level of performance and reliability, we subject every circuit in every amplifier to the most demanding test parameters in the industry...

but the most important test can only be provided by you.

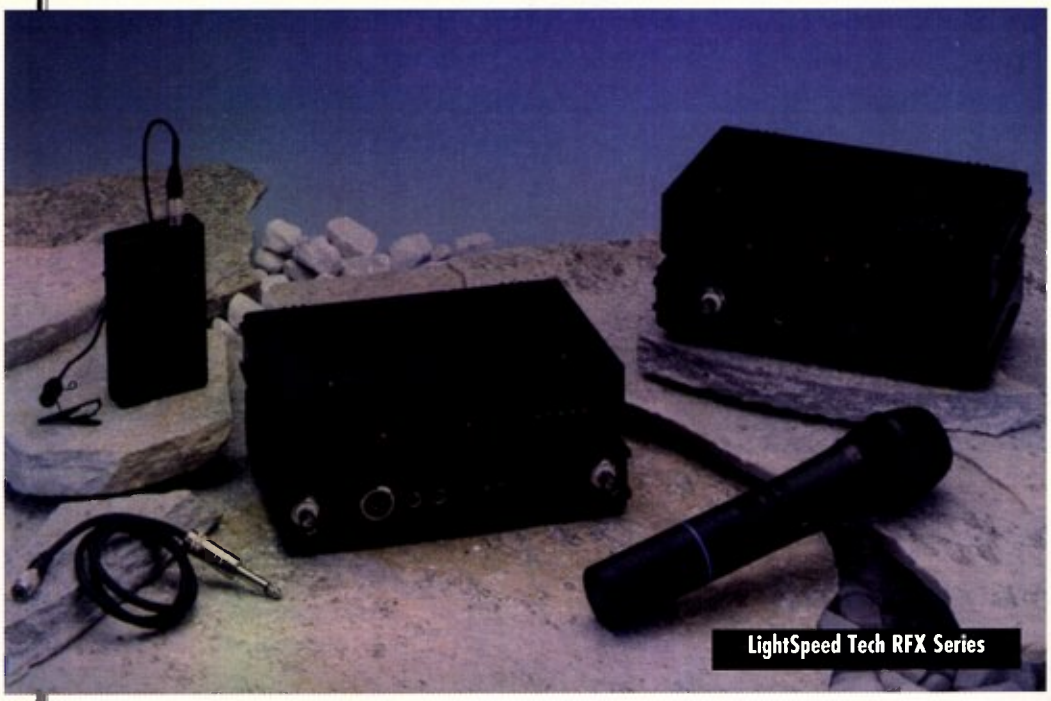
Call 800/234-6831 for a demo, a brochure and all the details you need.

Designed to Please the Two Most Stringent Testing Devices...

CIRCLE 33 ON FREE INFO CARD

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

World Radio History



LightSpeed Tech RFX Series

See the Light

LightSpeed Technologies has introduced a new RFX Series of VHF wireless microphones. The RFX Series consists of two new receivers plus new handheld and beltpack transmitters. All of these new products utilize the proprietary Pilotone to achieve significant improvements in anti-interference reception. The RFX 1500 and 500 are rackmountable half-rack units. The RFX 1500 is a dual-tuner true-diversity receiver with a carrier frequency range of 160–250 MHz VHF. The RFX 500 is a single tuner receiver with a fixed frequency. The new BP-150 belt-pack transmitter features a high-impact plastic case for good durability. The HM-50 handheld transmitter is available with four popular microphone capsules. The entire RFX Series wireless microphone systems are offered in lapel, handheld, headset, and guitar system configurations. List prices range from $390–$650. Interested? Contact, LightSpeed Technologies, Inc., 15812 SW Upper Boones Ferry Rd., Lake Oswego, OR 97035. Tel: 800-732-8999. Circle EQ free lit. #134.

Earry Feeling

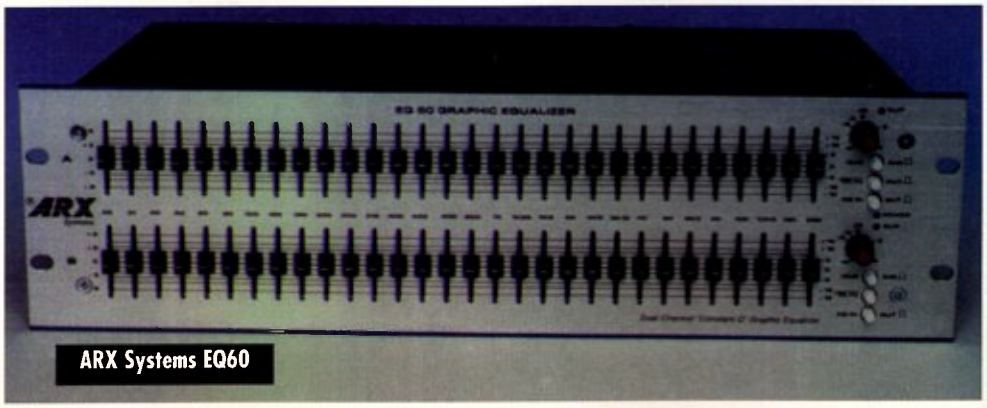
As in-ear monitors become more popular, prices have been dropping. This trend is seen in Nady's new E03 wireless in-ear monitors. The system consists of one wireless transmitter with 300-foot range and any number of wireless bodypack receivers equipped with earbuds. The transmitter operates on one of eight factory switchable channels in the 72–76 MHz band, and can be used on the same stage with existing VHF (170–216 MHz), or UHF (459–950 MHz) wireless microphones and instrument systems. Located on the transmitter's rear panel is a 1/4-inch jack, an input gain adjust, and internal circuitry to provide 30 dB of automatic level control. Located on the front panel of the transmitter is a 1/4-inch microphone input for use in cueing performers on stage. The EO3's receiver can be powered by a 9-volt alkaline or rechargeable battery that also can be recharged without removing. Retail price is $299.95. To hear more, contact Nady, 6701 Bay St., Emeryville, CA 94608. Tel: 510-652-2411. Circle EQ free lit. #135.

Winning Team

Combine the Sony TCD-D7 portable DAT recorder and the Sony SBM-1 adapter, and you get a team that's ready-to-go for on-location recording. You get to reap the rewards of Super-Bit Mapping (SBM), and achieve virtually 20-bit performance on fully compatible 16-bit DAT cassettes through the analog input. Other features on the SBM-1 adapter include built-in 20-bit A/D converter, manual recording level control, and an LED battery indicator. For more details, contact Sony, 3 Paragon Drive, Montvale, NJ 07656. Tel: 800-635-SONY. Circle EQ free lit. #136.

Aussie EQ

ARX Systems, the Australian-based pro audio manufacturer, has introduced the EQ60 Constant Q dual 1/3-octave graphic equalizer. This graphic EQ features a signal to noise ratio of –94 dB unweighted, and a dynamic range of 118 dB. Distortion rates at a low .004 percent. The EQ60 features switchable ±15 dB or ±6 dB of equalization on center-grounding damped sliders, electronically balanced inputs and outputs, hardwire bypass, and input level controls with up to 6 dB of gain. For information, contact ARX, 9400 Culver Blvd., Suite 203, Culver City, CA 90232. Tel: 310-837-1380. Circle EQ free lit. #137. EQ



ARX Systems EQ60

World Radio History

Matica™ Power Amplifiers Are Audio Machines

Introducing the Alesis **Matica™ 500** and **Matica™ 900 High Speed Wide Bandwidth Dual Channel Power Amplifiers**. The first amplifiers to offer accuracy, precision and refinement with the performance of brute force audio machines. These are terms not often associated with professional audio amplifiers. But this isn't the first time Alesis has rewritten the rules.

ACCURACY

In the studio, the Matica amplifiers can handle the most critical reference monitoring situations. To accurately reproduce every nuance of today's digital recording, your amplifier must be able to keep up with the fastest audio transients. This ability is called slew rate. Matica's slew rate is a blazing 80 volts/micro-second and the frequency response is flat out to 80 kHz, for crystal-clear definition of high frequency detail without phase and amplitude distortion...a must for a great mix. The wideband noise is better than 103 dB below full output, A-weighted, and the typical midband distortion is better than .009%, making Matica an incredible amplifier for *any* recording studio application. Especially yours.

PRECISION

Matica amplifiers also have the muscle needed for professional live sound reinforcement. Most amplifiers have problems dealing with the low impedances typical of many live sound applications. We designed Matica amps to maintain their brilliant sonic characteristics while producing exceptional 2 ohm power ratings (350 and 680 watts for the 500 and 900 respectively). Matica uses the latest generation of ultra fast, linear power semiconductors, with high SOA (Safe Operating Area) ratings for improved reliability. Matica's high density, high efficiency, bobbin-wound power transformers produce more power and less heat than conventional units. The Matica amplifiers do not skimp on the important protection circuits needed for the most demanding professional applications. Matica's high current output relays protect the amplifier and your speakers from turn on/off transients, over temperature, DC offset, audio signals below 5 Hz, and excessively low line voltage. Bipolar output current limiting, RF interference protection, and a resettable AC mains circuit breaker are also provided.

aLink™

REFINEMENT

Matica amps employ balanced, 1/4" gold-plated TRS/XLR connectors and, for permanent installations, barrier strip inputs. Outputs are on five-way binding posts that accept heavy-gauge speaker wire and banana plugs. A recessed rear panel switch allows you to select stereo or bridged mono modes. Matica also features the new aLink™ Amplifier Interface, a 25-pin rear panel jack that is a platform for system level accessories from Alesis and 3rd party manufacturers. Future aLink interfaces will expand Matica's capabilities by allowing you to control levels, interface crossovers and signal processors, and monitor protection circuitry from a remote location. Finally, Matica's CoolSync™ (Patent Pending) Thermal Management System combines a whisper-quiet, dynamically controlled, brushless DC fan with a massive extruded aluminum heat sink to keep the operating temperature under control. CoolSync eliminates thermal cycling, which hinders both output power at low impedances and long-term reliability of other amplifiers. It makes Matica amplifiers cool by any definition.

The Matica 500 and 900

were designed by experienced engineers who have created extremely high-end reference amplifiers as well as bullet-proof touring amps. Now, with Matica, they've created what could be their crowning achievement. Gear up for the ultimate in amplification at your Alesis Dealer.

Matica. The Power of Alesis.

For more information on the Matica 500 or Matica 900, call 1-800-5-ALESIS or see your Alesis Dealer.
Matica 500, Matica 900, aLink and CoolSync are trademarks of Alesis Corporation.

ALESIS STUDIO ELECTRONICS

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016 1-800-5-ALESIS ALECORP@Alesis1.usa.com

Amplifier	8Ω - 2 CH	4Ω - 2 CH	2Ω - 2 CH	8Ω - BRDG	4Ω - BRDG
Matica 500	162 Watts	250 Watts	350 Watts	500 Watts	650 Watts
Matica 900	270 Watts	450 Watts	680 Watts	900 Watts	1350 Watts

Matica Power Output Rating — *Typical, 1kHz 1%THD, both channels driven.*

CIRCLE 07 ON FREE INFO CARD

World Radio History

GET OFF YOUR FEED

HOW TO GET RID OF THE ANNOYING SQUEAKS AND SQUEALS OF FEEDBACK

BY STEVE LA CERRA

ONE OF THE MOST common problems faced by musicians performing live is feedback. Most of us can easily recall the two main flavors of feedback: a high squealing type and a low howling type of sound. Of course, feedback can also be caused by facing an electric guitar towards a guitar amp that is cranked up to a loud volume. But we'll assume that your guitar player has her Hendrix imitation under control and that this type of feedback is not your main concern right now.

START AT THE SOURCE

The biggest source of feedback for club musicians comes from the stage monitors, and placement of the stage monitors relative to the vocal microphones is critical to controlling feedback. Take a look at fig. 1: it shows a monitor placed at the front of the stage facing where a performer would stand (and thus facing the back of the microphone). Given a microphone with a cardioid pickup pattern, this monitor is placed at the "null" point of the mic — the spot where the cardioid pattern rejects sound — and its position will help control feedback.

Now take a look at fig. 2: this diagram shows a microphone placed on stage with two monitors, one on either side of the mic. This monitor placement is ideal for a hyper- or supercardioid mic because these pickup patterns reject sound coming from the two spots where the monitors are situated. The monitors are still pointing towards the performer's ears, but they are moved slightly to the side of the mic stand. If you are using a hypercardioid mic with the monitor placed directly in front of the performer (as in fig. 1), there will be a tendency for the system to feedback because most hypercardioid mics have a pickup "lobe" at the rear (whereas a cardioid mic does not). It is worth mentioning that an omnidirectional mic really is not desirable in a live situation — it will make feedback virtually impossible to control.

If the budget permits, feedback problems due to monitor placement can almost be eliminated by outfitting the members of the band with in-ear monitors.

Even with the monitors properly located, there is still a chance for feedback to occur when the band starts to crank up loud. One way of further reducing the possibility of feedback is to leave the monitors at a low level. This is guaranteed to annoy the lead singer who will complain that he or she cannot hear their own voice over the din. A widely used tactic in the war on feedback is equalizing the monitors to attenuate the particular frequency or frequencies at which feedback happens. A graphic or parametric EQ can process the cue send from the console, but systems with multiple monitor mixes will need an equalizer for every cue mix. The engineer will have to "ring out" each monitor mix to remove the offending frequencies.

FIGURE 1: Placing the monitor at the null point of the m

Some engineers find it helpful to roll off frequencies below about 200 Hz, but this is most effective in situations where the musicians are hearing only vocals in the monitor system. If drums and bass are being mixed into the monitors, this kind of equalization will make the mix thin and wimpy.

The process of EQing monitors is made more complex when there are different brands and models of microphones being used for vocals (this is especially true in cases where an entire band is sharing one or two monitor mixes). Each microphone has its own characteristic frequency response, and when you have the monitors EQ'd for the lead singer's mic, it is quite possible for the guitar player's vocal mic to still feedback. The solution for this is to get everyone in the band to use the same microphone (and the same monitor). Although it may take some negotiation among the band members, the monitors will be *far* easier to EQ, and the likelihood of feedback will be greatly reduced. Make a careful decision about which mic should be used — the amount of gain-before-feedback varies greatly within the current generation of mics.

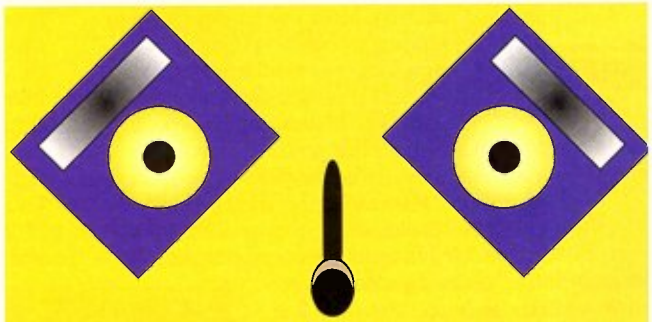


FIGURE 2: Placement for hyper- or supercardioid mic.

GOING CHEAP

There is one technique for reducing feedback from the monitor system that might not cost you anything. You can try reversing the polarity of the specific microphone from the rest of the audio system. This can be accomplished simply by hitting the mic polarity switch at the console. It sometimes works.

If you have applied all of these techniques and are still having problems you might want to try one of Sabine's Feedback Exterminators. These devices detect the frequency at which feedback is happening and automatically apply a digital filter.

Although the majority of feedback problems occur due to interaction problems between the mics and the monitor system, there are certain measures that can be taken to reduce feedback from the PA mains. Using directional microphones is a good idea. And though obvious, make sure that the mains are positioned in front of the band. I am amazed at how often I see a band using their PA speakers placed behind them. This is asking for feedback. The only feedback that you want from the house is positive feedback! EQ

World Radio History

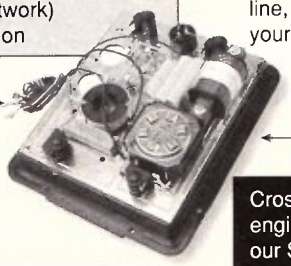
IF YOU'RE LOOKING FOR GREAT SOUND, THERE'S NO BETTER DEAL

(Listen to SoundTech and Compare)

Live Series model LS5HC

With over 25 speaker enclosures in the SoundTech line, there's one perfect for your application.

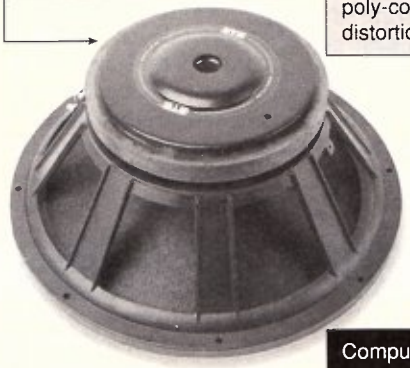
High powered passive crossovers feature D.A.C.N. (Dynamic Analog Compression Network) HF driver protection



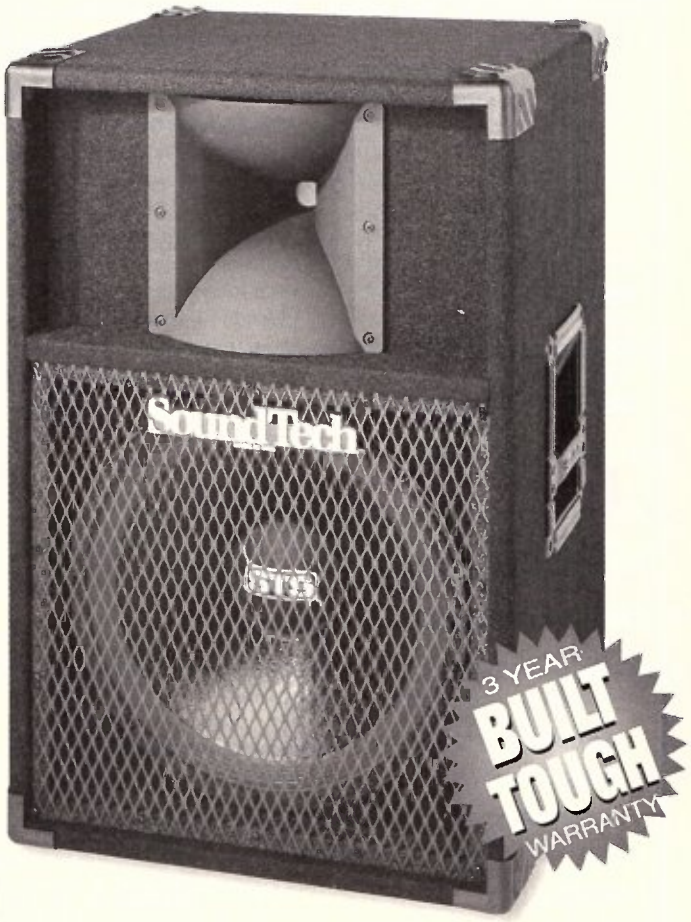
Crossovers are engineered to match our STS components

"Domed" back plates allow for extra long cone excursion. Delivers more bass because the voice coil can't "bottom-out".

Speaker cones are specially poly-coated to eliminate cone distortion and to resist moisture.



Computer tuned cabinets are made of Duraply™ and Marine grade, solid-core plywood.



Watts in a Name

If you don't shop around for pro audio, you're going to pay too much. There are plenty of trusted names out there, but they can carry a heavy price tag. Want to *save money* and still get *great sound?* Listen to a SoundTech speaker system. Hear the clear, articulate sound and smooth frequency response, then compare us to the other major brands. We guarantee you'll be amazed by the sound *and* the price.

For the location of a stocking Sound Tech dealer near you... Call 1-800-US-SOUND, ext. 131 / 132

STS™

STS is a trademark of SoundTech

No Compromise

So you're thinking, "What's the catch?" There isn't one. SoundTech enclosures are built tough, loaded with quality components and *made in the USA*. So why does the competition cost *so much more*? Please ask them, we're wondering too. Get a better deal for your audio dollar, buy SoundTech.

SoundTech™

PROFESSIONAL AUDIO

255 Corporate Woods Parkway
Vernon Hills, IL 60061-3109 USA (708) 913-5511

CIRCLE 60 ON FREE INFO CARD

World Radio History

EQ LIVE

TL Audio Dual-Valve EQ

PROVING THAT TUBE EQ need not be expensive, TL Audio (Tony Larking Audio) is offering two independent channels of switched shelving HF and LF, peaking mids, and line and phantom-powered mic inputs for considerably less than you'd expect to pay for a single-channel unit.

Each channel uses two twin triode tubes, and, after a low-noise semiconductor front end, they're divided between the voltage amp (which means you can push the gain to distortion if you want), the HF and LF bands, and the LM and HM.

This is no Tube Tech, but the switches are totally silent and the pots have a smooth, if slightly loose, feel. [*The manufacturer informs* EQ *that the "slightly loose feel" is no longer a problem with the latest pots.—Ed.*] This device is incredibly quiet.

Connections are electronically balanced mic and line inputs on XLRs. Outputs are electronically balanced on XLRs and switch selectable on the rear panel for –10 dBu or +4 dBu operation. Line inputs/outputs are duplicated on unbalanced 1/4-inch connectors. Each channel has a separate unbalanced insertion point available on the back panel as a stereo jack socket.

You also get an instrument level input that increases the versatility and the amount of use you'll get out of your investment. This normally feeds Channel A, but flicking a switch in the middle of the panel cascades this into channel B for 8-band mono operation. It verges on overkill, but I'm sure there will be times when it'll be of use.

Part of the charm of switched EQ is the fact that it makes some of the decisions for you, putting you into a position where you have to make do with what there is. Combine this with very broad bandwidths in the mid bands and 12 dB/octave slopes on the HF and LF shelves and the frequencies stop meaning that much. It creates an attitude where you reach for a band — in all cases you've got four nicely spaced frequencies to choose from — and then simply decide how much. The results are immediately satisfying and you can get a sound up very quickly. You can then spend the time you've saved congratulating yourself on how good it sounds.

The arrangement of the bands is useful and the breadth and delicacy of the curves mean they perform more like traditional tone controls than snazzy parametrics. To give you an idea of just how wide these curves are, if you put maximum cut on each band and step up in frequency through the bands starting at 500 Hz in the LF, your average mix all but disappears.

The TL Audio Tube EQ sounds good and smooth. The LF section 60 Hz gives an almost imperceptible super-low lift without complicating matters further upstream, while the same shelf at 120 Hz was made for kick drums. The higher settings here do wonders for sources lacking whoomph.

All sections have a lot of overlap, which means that while the mid bands can be made to interact, the width of their bells means you're not going to be able to pull a notch out while boosting widely in the same vicinity. However, that's not what this equalizer was designed for. This is a sweetener and gentle corrector with the HM section having perhaps the most profound effect on the overall space in the source.

The HF is superb and works like you'd imagine an HF shelf would work if you'd never actually heard one. Just a smooth lifting or dampening of the top end. A peculiar effect of this type of unit is that as you roll off the HF you detect the desired reduction in high frequencies but it doesn't sound less bright. It's as if the remaining upper end has been compacted rather than ripped out. It's very pleasing.

With a bit of care you can overdrive the front-end tube and generate some subtle harmonics, particularly at the bottom end. This is addictive. In fact, the unit is addictive. It's not a replacement for more variable and adjustable units, but if you're into EQ and you like the idea of tubes, then it has got to be worth it for this money. EQ

Road Test

MANUFACTURER: TL Audio, North American distributor: SASCOM Marketing Group. Tel: 905-420-3946.

APPLICATION: Studio and live equalization.

SUMMARY: Dual-channel, tube-based 4-band switched EQ with mic preamps and instrument input.

STRENGTHS: Characteristic tube sound; wonderful broad EQ bands; instantly satisfying to use; cheap for tubes.

WEAKNESSES: A sweetening tool not a corrective one; some may find the switched frequencies limited.

PRICE: $1395 **EQ FREE LIT. #:** 138

BY ZENON SCHOEPE

World Radio History

like adding a new power amp and your own personal sound engineer

Imagine having a device that gives you individual feedback control for any channel on your mix, makes your system louder, and increases the clarity of your mains and monitors. And while you're dreaming, make it automatic and affordable. Well, there's no need to dream. Sabine presents the latest member of our patented FBX Feedback Exterminator family: the **FBX-SOLO**, a miniature version of the award-winning FBX-901. One SOLO controls feedback on one input channel — you decide which feedback-prone inputs get automatic feedback control and maximum gain, from one channel to all your channels. It's like having your own personal sound engineer and adding a more powerful amplifier, for a lot less money!

MAXIMUM GAIN

THE FBX-SOLO SL-610: LINE LEVEL FOR CHANNEL INSERTS.

stop shooting flies with shotguns

How do we do it? Until Sabine invented the FBX Feedback Exterminator, the only practical solution for controlling feedback was the old-fashioned 1/3-octave graphic EQ. They're great for shaping your sound, but even the best EQ filters are actually one full octave wide, spaced out on 1/3-octave centers. Using those extremely wide filters to eliminate feedback is like shooting a fly with a shotgun — you're bound to damage something. The FBX replaces those wide filters with adaptive digital filters that are **ten times narrower**. Like all FBXs, the SOLO's patented algorithm automatically senses feedback and places these extremely narrow filters only as deep as they need to be to eliminate feedback. These precisely placed FBX filters remove the feedback without damaging your sound.

no feedback*

big sound — little package

We're using the latest advances in digital circuitry to make the FBX-SOLO very small. Six of them fit side-by-side in our single-space rack tray. Vocalists can carry one in their gig bag for personal feedback control at every performance. You can have more freedom than ever with your wireless microphone knowing the SOLO is taking care of feedback. Acoustic guitarists thrive on all that extra gain and clarity from such a small package. And the SOLO makes monitor engineers heroes, because they can patch a SOLO on every offending channel. Your monitors will **finally be loud enough**, and your mix will sound clearer, too, because those narrow FBX filters surgically remove the feedback without ruining your sound. And, by the way, the SOLO does it all automatically.

The SOLO comes in two versions: the **SOLO SL-610** for line level insert points on your mixer's inputs, and the **SOLO SM-610**, with mic level input (XLR & 1/4"), line level output for use with mixers that don't have insert points. The SM-610 includes a microphone pre-amp and phantom power. Both units are ruggedly built and fully digital.

USE ONE FBX-SOLO PER CHANNEL; UP TO SIX UNITS PER RACK TRAY. MIX MIC AND LINE VERSIONS TO MATCH YOUR SYSTEM REQUIREMENTS.

louder, clearer, better... all at a price you can afford

The FBX-Feedback Exterminator is the industry standard for automatic feedback control. Now the FBX-SOLO allows you to put the best feedback controller on any channel in your mix. And **the SOLO is very affordable** — it even costs less than most graphic EQs! The FBX-SOLO — the fastest, most accurate, and most affordable way to get maximum gain before feedback, keep your sound clean and clear, and do it all automatically. Make us prove it. Visit your dealer or call Sabine today to arrange a demonstration of the FBX-SOLO.

The FBX-SOLO targets feedback without taking a big chunk out of your sound. Digital FBX filters are 10 times narrower than graphic EQ filters. You get back over 90% of the power you lose with a graphic EQ!

(MINIMUM PRICE)

MADE IN USA

FBX Feedback Exterminator is a registered trademark of Sabine, Inc., and is the brand name of its line of automatic feedback controllers. Covered by U.S. Patent No. 5,245,665. Other patents pending.

*Feedback automatically detected and eliminated in 0.4 seconds, typical @ 1 KHz

SABINE™
ADAPTIVE AUDIO

Sabine, Inc.
4637 N.W. 6th Street
Gainesville, FL 32609
Telephone: 904/371-3829
Fax: 904/371-7441

SOLO.FPA1.02/08/95

CIRCLE 52 ON FREE INFO CARD

World Radio History

Symetrix 488 Dyna-Squeeze

EQ LAB REPORT

MANUFACTURER: Symetrix, 14926 35th Avenue West, Lynnwood, WA 98037. Tel: 800-288-8855.

APPLICATIONS: Allows digital recorders to react more like analog tape by letting you "push" levels for a more compressed sound.

SUMMARY: The Dyna-Squeeze is an effective way to cut "hotter" tracks with digital recorders, but it's important not to overcompress.

STRENGTHS: Relatively inexpensive; does what it claims to do; sonically unobtrusive when properly set up.

WEAKNESSES: Not really flexible enough to use as a conventional compressor, too; no connector block for mating with ADAT/D8.

PRICE: $579 **EQ FREE LIT. #:** 139

DIGITAL MULTITRACKS are wonderful machines, but many engineers miss the forgiving nature of analog tape, which "soaks up" excess levels due to a phenomenon known as tape saturation. Although saturation produces compression and distortion, the distortion is a "warm" distortion that adds a subjective feeling of power, while the compression gives punch and brings out lower-level signals that could otherwise be buried in a mix. Exceed digital's limits, though, and you get a very nasty kind of distortion — so you have be very careful about watching peak levels.

WHAT IT DOES

The 488 helps bring back the "feel" of analog tape by adding eight channels of compression between your mixer bus outputs and digital multitrack inputs. (Note that the 488 does not add "crunch," just compression.) Signals above the threshold level undergo soft-knee compression at a gentle 2.5:1 ratio, which brings down peaks and lets you increase the overall level, thus raising softer signals. Restricting the dynamic range gives more punch and also lets you be a little more sloppy about setting levels (particularly helpful for live recording).

HOOKUP

The rear panel has individual input and output phone jacks that mate with balanced or unbalanced lines. There is no connector for direct interfacing with the ADAT or D8 connector blocks; however, adding one Elco and two DB-25 connectors would have meant a serious price increase, so we'll let it slide.

The output level switch is deceptively useful. It has two positions: unity gain and output level drop so you can feed a –10 dB tape recorder with a +4 dB console. In the latter position, you can take full advantage of the console's headroom without

World Radio History

causing distortion at the multitrack.

The 488 has a fast attack/slow release action. Attack time is fixed at 1 millisecond and release at 1 second, so the only controls you need to adjust at the 488 are the master threshold and output controls, which affect all channels simultaneously. This may seem like a limitation at first, but the threshold setting is referenced to the recorder's clipping point rather than the signal itself; therefore, it doesn't make sense to try to treat this as a conventional compressor, where you want to vary the effect for different signals. For those applications, you can insert a traditional compressor in-line. (However, note that its effect will be augmented by any compression added at the 488, so you might want to back off a bit on the compression ratio you'd normally use, or put the 488 into bypass mode when recording a traditionally compressed track.)

MAKING IT SO

Setting levels is a bit unusual because there aren't any level controls, other than the mixer outputs feeding the 488. The manual recommends an initial setup procedure that matches the 488 to your console; for more compression and a hotter sound, increase the console level going to the 488, and for less compression, reduce the level.

It sounds simple, but in practice even 5 dB of gain reduction is a substantial amount. It's easy to overcompress because the action is fairly transparent...until you overcompress, at which point it sounds squeezed and unnatural. (Note that you can often hear the effects of the compression before the first gain-reduction LED lights.) For best results, make friends with the Bypass switch. If you hit the same peak levels in active and bypass modes, but the active version sounds "hot" without sounding compressed, then you've found the right setting.

SO DOES IT WORK?

At $75 per channel of compression, the Dyna-Squeeze is quite cost-effective, and it can really enhance your tracks. However, despite its simplicity, it does take practice to get the most out of the 488. Some people will not take the time to set levels correctly, overcompress eight channels at once, and pronounce the 488 as sounding "bad." It's very important to send the right levels to the Dyna-Squeeze, but when you do, the 488 delivers on its promise: hot tracks, even with digital gear. *—Craig Anderton*

Spec-Tacular

Channels: Eight

Inputs/outputs: 1/4-inch phone, balanced/unbalanced jacks

Gain reduction element: THAT 4301 VCAs

Power: Internal supply, three-wire cord

Master controls for all channels: Threshold (–40 to +10 dB), output trim (–10 to +10 dB), active/bypass switch, output level switch (+4 or –10)

Meters for each channel: 4-step LED gain reduction meter, 5-10-15-20 dB

Note: Download a recorded AIFF sample of the 488 that shows the difference between active and bypassed modes. Go to "Craig Anderton's Sound, Studio, and Stage" area (keyword: SSS) on America Online, then click on "EQ On Line."

The 488 helps bring back the "feel" of analog tape by adding eight channels of compression between your mixer bus outputs and digital multitrack inputs.

World Radio History

Steinberg/Jones ADAT Interface

EQ LAB REPORT

MANUFACTURER: Steinberg/Jones, 17700 Raymer St., Northridge, CA 91325. Tel: 818-993-4091

APPLICATION: Interface box provides two-way communications between one or more Alesis ADATs and an MMC-compatible sequencer.

SUMMARY: The ACI provides sync from an ADAT without sacrificing an audio track, but really comes into its own when teamed with an MMC-compatible sequencer.

STRENGTHS: Generally simple to use and set up. Reasonably priced. Designed to accept future sequencer updates that provide more control over ADAT functions.

WEAKNESSES: Cannot change tempos when generating MIDI clocks. Awkward to use with nonmultiport computer interfaces.

PRICE: $399 **EQ FREE LIT. #:** 140

THE BIG REMOTE CONTROL (BRC — reviewed in the January '94 issue) unlocks the full synchronization and automation potential of any ADAT system. As its $1995 price tag implies, however, this is an "everything-but-the-kitchen-sync" device that may be overkill for those with more modest needs.

Enter Steinberg/Jones' ACI, a "baby BRC" for those who simply want a tight ADAT/sequencer connection. It provides sequencer or drum machine sync directly from ADAT — without giving up an audio track — by translating ADAT's proprietary timecode to MIDI Timecode (MTC) at four different frame rates (24, 25, 30, and 30 drop frame) or MIDI clocks with song pointer. Add a MIDI Machine Control (MMC)-compatible sequencer, and the ACI can, among other things, translate the sequencer's "transport" window or record-enable commands into MMC-compatible messages that control ADAT. Sound like fun? Well, it is.

The ACI has connectors for MIDI in, MIDI out, ADAT sync in, ADAT sync out, and power (provided by a 9V AC external transformer). Hookup is easy with single or multiple ADAT setups, and the ACI includes all the necessary ADAT-related cables.

When using the ACI to generate MTC, those with single-port MIDI interfaces will need a merger to combine the ACI's MIDI out with whatever controller you're using to play data into the sequencer. (When generating standard MIDI clocks, the ACI merges the input and clock data, so the sequencer will "hear" a keyboard playing into the MIDI in.) Furthermore, unless you can tell the program not to echo sys ex information from the MIDI in to the MIDI out, the ACI will go into a MIDI feedback loop (not disastrous, but things won't work either). You can add a sys ex filter, but this adds to the total system cost.

World Radio History

The ACI is much more at home with a multiport interface, since you can dedicate a MIDI in and out to the ACI. (Also, the manual recommends giving the ACI its own dedicated input for timing reasons; MTC takes up a fair chunk of the data stream.)

Bottom line: For most "power users," even those with moderate setups, the ACI will fit right in. Those with very basic setups may need to repatch, or purchase an additional box or two.

The front panel is uncomplicated; it consists of a push button to scroll through the five sync output options (four MTC rates and MIDI clock), each represented by its own LED. There's also a power indicator LED and MIDI in activity LED. Sounds simple, right? Well, it's actually even simpler, since most of the time the ACI automatically chooses the correct frame rate based on what the sequencer tells it to do. Once you hook up the ACI, operating it is a no-brainer.

THE SOFT MACHINE

I tested the ACI with Cubase Audio (Mac). Since Cubase exists for three platforms, the required MMC driver files come on two disks, one for Mac and one for Atari/IBM machines. Copying a small file to the Cubase folder (Mac) or M•ROS folder (Atari/PC) adds the drivers. Currently, the MMC software won't recognize different "cables" within a multiport interface; you have to use the modem port's lowest-numbered MIDI in and out. Steinberg/Jones claims this will be fixed in future versions.

After telling the ACI where to find incoming ADAT data, you're ready. The ACI works as expected, letting you control the transport, maintain sync, and record-enable (including multiple tracks) from the sequencer's transport window.

You can also record-enable ADAT tracks from within Cubase, but ultimately, the degree of control a given sequencer offers depends on how much ADAT control the programmers designed into it. By the time you read this, it is likely that several sequencers will incorporate ACI-compatible ADAT commands. (The ACI can theoretically communicate with all ADAT functions, including "hidden" ones used by the BRC).

The only real compromise compared to the non-MMC Cubase is that you can't click the song position indicator and have the tape follow — you have to use fast forward or rewind. Overall, though, the integration is smooth enough that you start to think of ADAT as a sequencer-controlled computer peripheral. Definitely cool.

Using the ACI to convert ADAT timecode into MIDI clocks and song pointer data rather than MTC can give disappointing results, since you're restricted to a constant tempo in the range of 40 to 240 BPM. I feel subtle timing changes are essential to expressive sequencing, so this strikes me as a pretty serious limitation. If you don't use tempo changes, or are sequencing less-critical timing events (MIDI fader moves, signal processor parameter changes, etc.), however, this is not an issue.

IS IT WORTH IT?

You're paying around $500 per ADAT track; if you use one up for sync, you can get the track back for $399. That's a good enough raison d'être for the ACI, but if you have an MMC-compatible sequencer, the ACI becomes addictive. Running everything from your computer is actually a bigger deal in practice than it sounds in theory — there's less distraction, only one interface instead of two, and a more streamlined feel. This little box can definitely make life in the studio easier; check it out.

(Extra credit: On request, Steinberg/Jones will provide the ACI sys ex spec so that programmers can design their own remote programs for customized ACI control. A rack-mount kit is also available.) — *Craig Anderton*

Microphones
Signal Processors
Digital Multitrack
Mixing Consoles
MIDI Gear
Monitors

grandma's music & sound

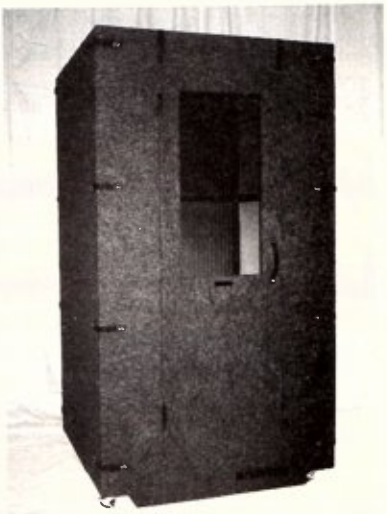
800-444-5252

Price Quotes & Information
505-292-0341
Fax 505-293-6184

800 S-T Juan Tabo Blvd NE
Albuquerque, NM 87123

CIRCLE 39 ON FREE INFO CARD

WhisperRoom INC.
SOUND ISOLATION ROOMS



Recording • Rehearsal • Broadcasting
Remote Capabilities • Audio for Video
A/B Testing • R & D
Assemble/Disassemble in Minutes
Various Sizes • Expandable
Choice of the Pro's!
Tel: (615) 585-5827 Fax: (615) 585-5831
116 S. Sugar Hollow Rd. Morristown, TN 37813 USA

CIRCLE 77 ON FREE INFO CARD

World Radio History

Sound Forge 3.0 Sample Software

EQ LAB REPORT

MANUFACTURER: Sonic Foundry, 100 South Baldwin, Suite 204, Madison, WI 53703. Tel: 608-256-3133.

APPLICATION: Pro sample editing software for the IBM/Windows PC.

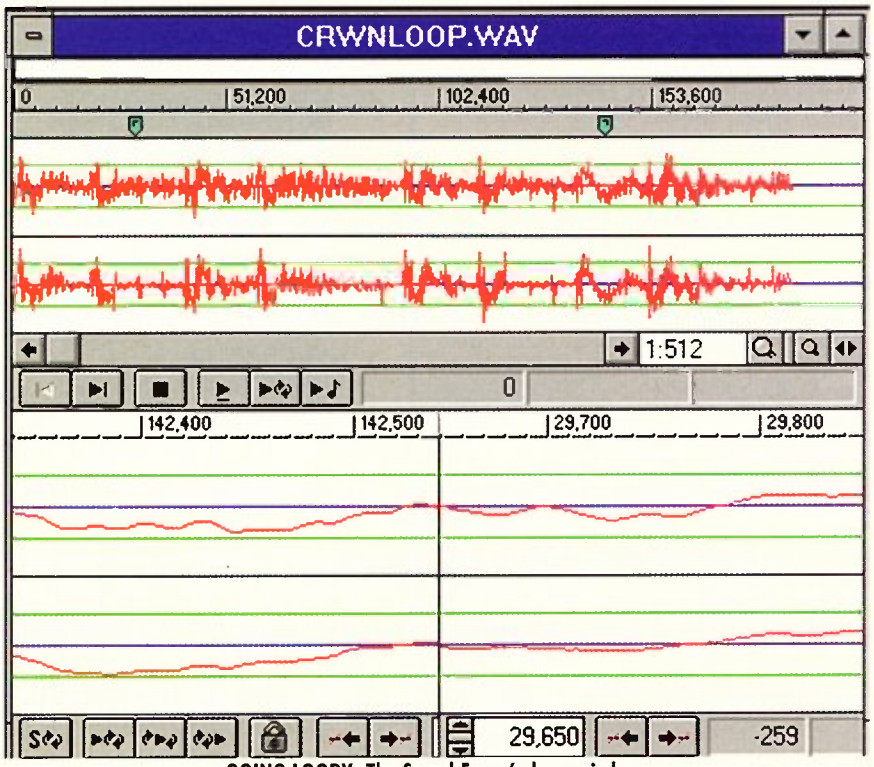
SUMMARY: Sound Forge 3.0 is able to record or import sampled audio to an IBM/Windows PC, edit and process the sampled data, save it to hard disk, and then export these archived sounds back to any sampler via SDS, SCSI or SMDI.

STRENGTHS: Easy to use; useful DSP, looping, and editing features; well-written manual.

WEAKNESSES: Waveform display could have a better; more scaleable resolution; this program is designed to edit and import/export only one sample at a time; a function that would allow for an entire bank of organized samples to be snatched from or sent to a sampler would be a welcome asset.

PRICE: $495 **EQ FREE LIT. #:** 141

OVER THE PAST decade we've seen a number of sample editing packages that can record or import sampled audio to a personal computer, edit and process the sampled data, save it to hard disk and then export these archived sounds back to a sampler. Up to now, though, almost every professional sample editor had been programmed to work on either the Mac, Atari, or the Amiga PC. That is, until Sonic Foundry recently unveiled the Sound Forge Version 3.0 software for the IBM/compatible PC under Windows.



GOING LOOPY: The Sound Forge's loop window.

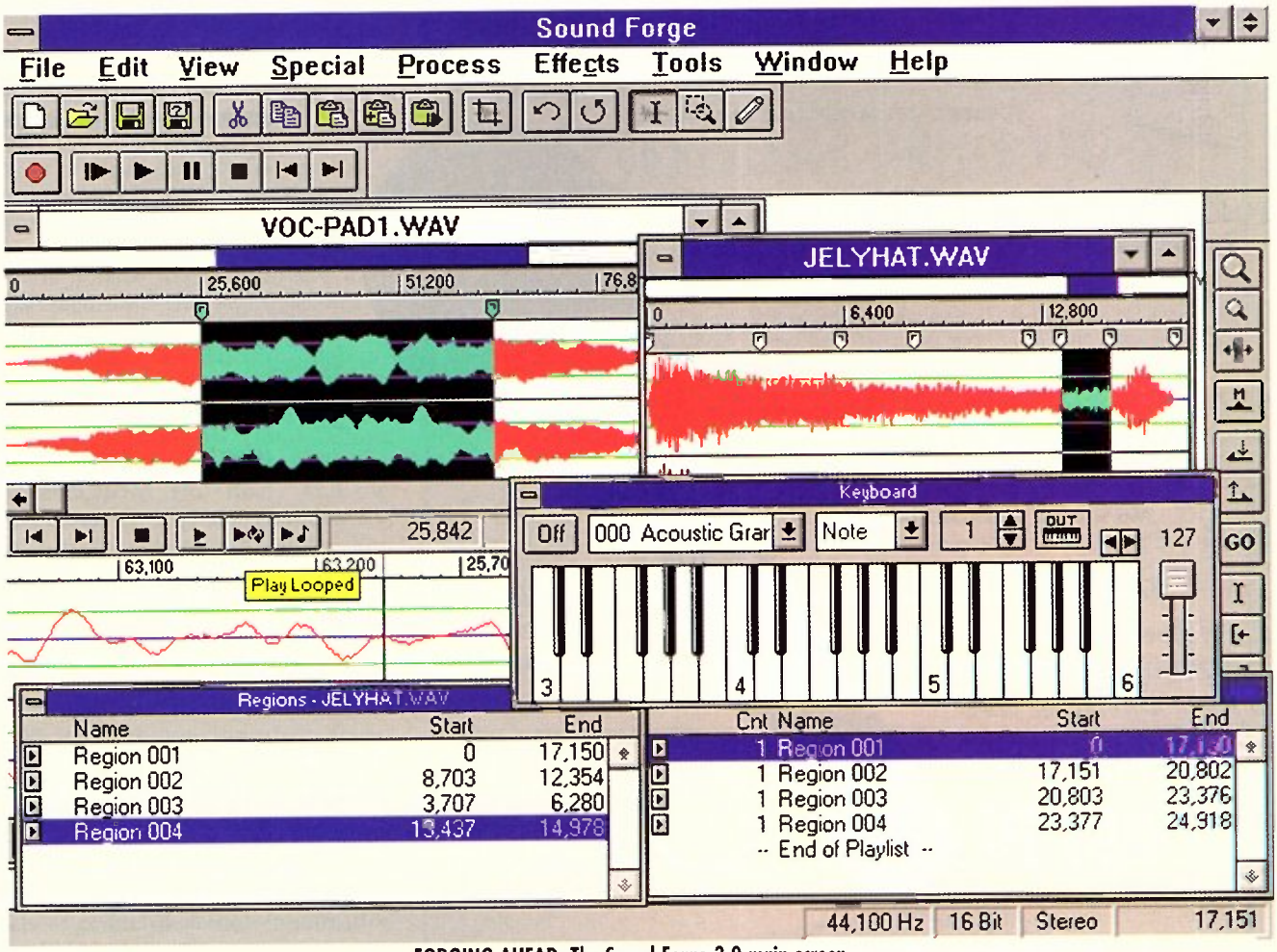
Sound Forge is a Windows-oriented program that offers a large assortment of on-screen menus, functional icons, and tool bars for processing any one of the numerous soundfiles that can be placed onto the screen at a time.

Soundfiles can be imported and converted to or from hard or floppy disk using a number of audio formats, including .WAV, .SND, Macintosh AIFF and resource files, Amiga .SVX, and Atari Sound Designer 1 .DIG, among others. The program also includes a record screen that lets you record new sample/soundfile data directly to disk (a remote record window will also let you punch in and out of record while operating from within another program). Furthermore, samplefiles can be imported from and exported to samplers within a connected network. Samplefile transmission is generally carried out in either of two ways: via MIDI or SMDI. The rather slow but traditional MIDI sample dump standard (SDS) can be used to transmit serial data throughout a system using regular MIDI lines (SDS is almost universally supported by current and past 16-bit samplers). In addition to supporting certain SCSI-related samplers, a newly developed SCSI protocol called SMDI (an acronym for SCSI Musical Data Interchange) can be used to transmit data at speeds that can range up to 300 times faster than MIDI's transmission rate of 31.25k per second.

The wonderful part about SMDI is that the computer's SCSI port can be directly plugged into any sampler that supports it, without having to worry about installing or having the right transmission driver. The downfall is that not all samplers support SMDI. Although the list is continually growing, currently only Peavey, Kurzweil and E-mu implement SMDI into their hardware architecture. [*Further reading on SMDI can be found in Dave Huber's article "Make Way for SMDI,"* EQ, *October '94—Ed*]

Sound Forge is a cool and full-featured program that's definitely a useful addition to any digi-head's toolbox

World Radio History



FORGING AHEAD: The Sound Forge 3.0 main screen.

for processing, cataloging and shuffling both samplefile and soundfile data throughout a system.

Sound Forge offers a wide range of edit- and DSP-related functions, such as:

Processing: Auto trim/crop, DC offset, dither to 8-bit, fade, insert silence, invert/flip, mute, normalize, pan, resample, reverse, smooth, swap channels, time compress, and volume.

Effects: Amplitude modulation, delay/echo, distortion, dynamics, envelope, flange, gapper/snipper, noise gate, pitch bend, pitch change, reverb, and vibrato.

Tools: Auto region, FM synthesis, graphic EQ, parametric EQ, sampler import/export tools, search, simple synthesis, and statistical data

A few of these functions deserve special mention. Resample is a simple tool that lets you shift sample rates either up or down (with the appropriate anti-aliasing filters). Since most IBM-based sample-rate changers aren't straightforward (or just plain sound cheesy), the news here is that Sound Forge's resampling tool does the job well. Sound Forge's reverb, on the other hand, is pretty lame (strange, since all the other effects functions work extremely well). Likewise, the parametric EQ is poorly laid out (a definite "I don't get it" screen), while the graphic EQ's simplicity and sound quality are great. Sonic Foundry was the first to agree with me on these points and stated that updates, as well as several new processing plug-ins, were in the works.

This brings us to my personal fave — the auto region tool. Auto-region is able to sense fast transient attacks (like drum beats or words) within a soundfile and then break them into defined regions within a playlist. From this, segments can be either easily saved as separate samplefiles or rearranged in the playlist to create new and interesting variations.

At the program level, Sound Forge lets you create and edit single or multiple loops, using a visual loop editor that allows the waveform crossover points to be accurately shifted from the keyboard or mouse. Another useful function enables summary information about the samplefile to be directly embedded within the soundfile itself. This means that info relating to title, subject, engineer, copyright dates, and other comments can be saved in the background, along with the audio data.

There simply isn't enough space to tell you everything about this useful and straightforward program. Your best bet is to head out to a local MIDI-fied music store and check it out for yourself. *—David Miles Huber*

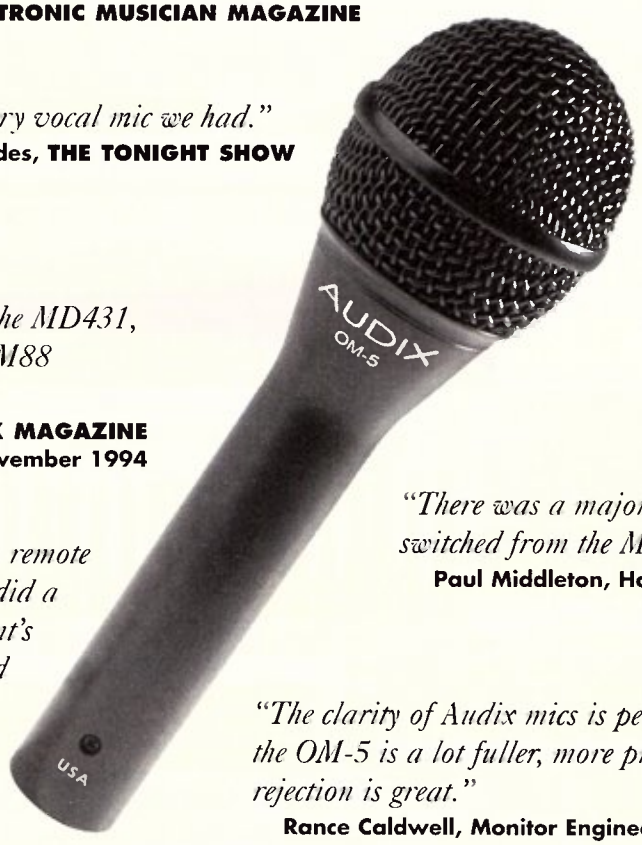
World Radio History

Take it...

1994 Editors' Choice for Best New Mic
ELECTRONIC MUSICIAN MAGAZINE

1995 Sound Products of the Year Award
THEATER CRAFTS MAGAZINE

"The OM-5 outperformed every vocal mic we had."
Bob Whyley & Steve Kades, THE TONIGHT SHOW



"The OM-5 outperformed the MD431, Beta 58, N/DYM857 and M88 for gain before feedback"
Mark Frink, MIX MAGAZINE
November 1994

"The OM-5 is the most significant audio improvement we've made to the show."
John Harris, Audio Engineer, JON STEWART SHOW

"There was a major improvement when we switched from the M88 to the OM-5."
Paul Middleton, House Engineer for BONNIE RAITT

"At a very crowded and noisy remote held on the street... the OM-5 did a superb job of defining the talent's voice and rejecting background clutter."
RADIO WORLD
February 1995

"The clarity of Audix mics is perfect... compared to the SM58, the OM-5 is a lot fuller, more present, and the feedback rejection is great."
Rance Caldwell, Monitor Engineer for CROSBY, STILLS AND NASH

from the experts.

In just one year, the Audix OM-5 has made a big impression. The reasons are clear—unmatched quality, uncolored reproduction, higher gain before feedback, and the Audix reputation for the very highest quality.

Unlike some mics that rely on neodymium magnets for high output, the OM-5 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, rejection and gain before feedback.

And the OM-5 is built for the road as well as the studio. Its rugged e-coat finish, durable gold XLR connector and precision tooling put the Audix OM-5 in a class all its own.

But don't just take our word for it... take it from the experts. Go try out an OM-5.

For more information, or the location of your nearest Audix dealer, call 1-800-966-8261 ext.500

Don't buy a mic without trying an Audix.

AUDIX®

© Audix Corporation, 1994. All rights reserved. Audix, the Audix logo and OM-5 are trademarks of Audix Corporation. Other trademarks are the property of their respective owners.

CIRCLE 16 ON FREE INFO CARD

World Radio History

AKAI DR8

continued from page 30

record five trial runs of a solo or performance through use of the Take function. Each of these performances can be kept until you decide which one will be the keeper.

All of these features certainly make the DR8 attractive, but it is the unit's built-in mixer that makes it stand out from the crowd. This mixer provides control over a total of 16 channels, the first eight of which accommodate tracks from the hard disk recorder. The eight "external" channels let you route signals (such as effect units or synths) through the analog audio inputs into the mix simultaneously with the hard disk tracks. The DR8's MIX mode allows you to adjust (and record) settings for level, pan, two effects, and bus on/off for each of the channels via built-in snapshot automation. You can also assign MIDI controllers for each of these mixer functions and record MIDI controller data to a sequencer for dynamic automated mixing. The output of the mixer can be routed back to two tracks of the HDR for ping-ponging of up to six disk tracks and eight external inputs. Akai is planning future introduction of the MT8 Mixtab, a hardware controller for the DR8's internal mixer. Akai also expects to introduce a digital EQ option that will add 16 channels of onboard digital equalization (available May '95).

The Akai DR8 is more than just a hard disk substitute for a tape recorder. The built-in mixer and external inputs truly make the DR8 a workstation capable of taking a project from basic tracks to mixdown. In fact, if you needed only six tracks for a particular project, you could even mixdown within the DR8 to the two available tracks. Akai has clearly intended for the DR8 to become part of the project studio future. Digital word clock and video sync input is standard allowing the DR8 to chase to house sync in video-post applications. The company also is planning an ADAT interface that will allow exchange of data between the DR8 and the Alesis units (using a single cable for all eight channels of data), as well as an RS422 interface board that will integrate the DR8 into film and video-post environments.

—Steve La Cerra

DEMETER

INNOVATIVE AUDIO SYSTEMS

TUBE COMPRESSOR LIMITER VTCL-2

The Demeter VTCL-2 Tube Compressor Limiter is finally here!

The two-channel (stereo or dual-mono) VTCL-2 is a unique design by James Demeter utilizing an all-tube audio path(no transformers, ICs, or Op-amps) and analog opto-isolators to drive the compressor. Featuring previously unheard-of versatility from a tube design, the VTCL-2 easily accomplishes every compression and limiting function with a minimum of noise and distortion and no signal degradation. Brickwall limiting, over-easy, hard-knee, peak-limiting, as well as signal 'squishing' and infinite sustain with live signals are easy for the VTCL-2. The VTCL-2 has the versatility and hi-fidelity sound quality to replace any compressor available new or used, at a reasonable price. Controls are provided for input and output gain, threshold, attack and decay speeds, stereo link or dual-mono operation, and bypass (buffered through tubes.)

Also provided for ease of interface are XLR, TT, 1/4" phone jacks on all inputs and outputs as well as pin selector switches on each.

THD=.0662 @1kHz • Variable Attack Time=<.5ms to >30ms
Gain=>34dB • Variable Decay Time=<200ms to >10sec
S/N ratio= -110 EIN • Tubes=(2)12AX7A, (2)12BH7A, (1) 12AT7A
Max output=>+24dB • Size=2-19" rack spaces
Max compression=>30dB • Shipping weight=17 lbs.

DEMETER 2912 Colorado Ave. #204 Santa Monica, CA 90404 • Sales : **818.986.7103** • Fax : **310.829.3755**

CIRCLE 23 ON FREE INFO CARD

AC Hum

Gone!

The Hum Eliminator™ from Ebtech stops the 60Hz buzz that's caused by groundloops, quick and easy. Just plug it into the signal lines between offending pieces of equipment and you're done.

And since it's not a filter or gate, it won't change your sound.

- Works with balanced or unbalanced signals at either end.
- Breaks groundloops safely while leaving all equipment grounds intact.
- Also available in Line Level Shifter™ version for converting back and forth between -10dBV and +4dBu.
- Two channels for $69.95 retail. Eight channels for $279.95 retail.

EBTECH
the experts in great sound

Call now for a dealer near you. tel. (619)679-6510, fax (619)679-2802

CIRCLE 31 ON FREE INFO CARD

World Radio History

Amek System 9098 EQ

EQ LAB REPORT

MANUFACTURER: AMEK. U.S. operations: 10815 Burbank Blvd., North Hollywood, CA 91601. Tel: 818-508-9788.

APPLICATION: Equalization and preamplification for all types of recording and mixing.

SUMMARY: Top-end 4-band EQ with high- and low-pass filters and a mic preamp.

STRENGTHS: Exquisite mic preamp and EQ performance; elegant subtlety to surgical precision; for a super EQ, it's positively affordable.

WEAKNESSES: None–apart from needing two for stereo.

PRICE: $1800

EQ FREE LIT. #: 142

THE RUPERT NEVE-designed Amek System 9098 EQ is based on the 4-band plus twin pass filter and mic preamp arrangement found on the Amek 9098 superconsole. There are, however, a number of differences that are not merely cost savings but also offer some improvements.

The desk has six switched frequencies on the HF and LF, while the frequency pots on the rackmount are continuously variable and cover a slightly broader range. The rackmount has switchable shelving/peak characteristics for the HF and LF, while the desk version has a pot on the LF to continuously vary between shelf and peak curve shapes.

The desk mid bands have X 5 multiplier switches and offer greater frequency ranges, but all bands in the rackmount benefit from a ±9 dB switch, which halves the boost/cut available and permits greater resolution in the pot travel for gentle tweaks. The rack-mount's low-pass filter has been extended to 30 kHz from the desk's 24 kHz.

Mic and line inputs are transformer-like amplifier balanced. The mic preamp output is electronically balanced, while the main EQ output is transformer balanced. This arrangement means you can use the mic output and line input as an insert, as well as allowing the two sections to be used completely separately.

IN USE

System 9098 encourages you to use your ears, as any equalization applied is clearly apparent and there is a very direct correlation between altering a value and hearing something happen. This feel aspect of the System 9098 is one of its strongest points. Subtlety of boost and cut differentiates a good equalizer from a lesser one. This is because most types are able to change a sound dramatically, but, in practice, few are able to alter a sound slightly but markedly. You'll be able to hear a dB on the 9098.

The mic preamp is remarkably fine. There is so much room in the sound — almost as if the mic can breathe deeper and more freely. There is enough gain available on the line input to take any piece of unbalanced semi-pro or domestic gear and run it at a level that makes the System 9098 happy.

Using just the HF and LF with Glow (LF) and Sheen (HF) selected and about 1 o'clock's worth of ±9 dB scale boost added at the frequency of your choice gives such a smooth lift to the treble and bass that even the sweetest and purest of sources will benefit.

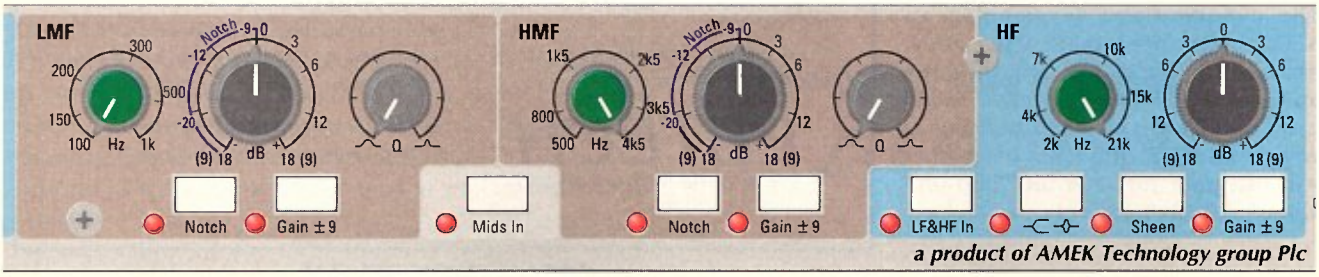
The full ±18 dBs can be pushed hard without unpleasant harshness, but I found myself with ±9 dB selected on pretty much all the bands nearly all the time, and I attribute this to the effectiveness of how ever little EQ is employed. I found I used full throttle 18 dBs on the Low mid most because it covers the "slam" region.

CONCLUSION

The System 9098 combines a creative and musical enhancing tool with a clinically incisive weapon for corrective measures by virtue of its carefully overlapping bands and notch filters. The chain is complemented by superb low- and high-pass filters.

Sure it's only single channel, but if you're looking for a top-end EQ for the really discerning stuff, then you'll get an exemplary mic front end for high-quality vocal and acoustic instrument recording thrown in.

You've got to hand it to the gentleman — Rupert Neve, that is; he still knows how to design them. Amek's input means that they know how to build them. Put the two together and you can now afford one. — *Zenon Schoepe*



World Radio History

BASEMENT MASTER

continued from page 80

the software gives you the option of actually writing the data to disc, or writing to a Virtual Disc. If you choose Virtual Disc, the software pretends to be recording to disc, but actually keeps the writing laser turned off. This allows you to make sure that all of your data can be spooled off the hard disk correctly without blowing a CD blank in the process. The manual highly recommends that you try this before actually writing the CD. I usually do it this way unless I am trying to add to my ever-growing pile of blown CDs.

One other point. I found out the hard way (after blowing a CD) that it doesn't matter in which order you drag tune titles over to the audio window, the tunes will be recorded to the CD in alphabetical order. After one CD down the drain, I added numbers to the front of each file name to have them sort in the right order.

Cool! (Second time I said that in the same article). Two big plusses about the Pinnacle Micro RCD-1000: Because of the way it records the audio to the disc, it places START IDs automatically and at the correct place just before the audio file starts. No more manual START ID button pressing. And I've been saving this for last, the RCD-1000 is a double-speed drive. If you have a fast enough computer and hard disck (remember, it has audio on it now), you can record CDs at double speed. This means that these CDs with 46 minutes of audio only took 23 minutes to record. The Fugitive Blonde CDs only took five hours, and since I didn't have to push the manual START ID button, I could work on the artwork at the same time.

Art's Mother

OK, so things were starting to get a little testy after another 15 hours of recording CDs. Not so, Photoshop breath. While my trusty Sound Tools/Pinnacle Micro-enhanced Mac was busy cranking out CDs, I fired up my trusty Mac Powerbook to work on the Fugitive Blonde CD booklet.

Another trip to Kinko's produced some 300-dot-per-inch scans of black and white head shots of the Fugitive herself. I loaded it into Photoshop, cropped it, and added the text. I decided not to use a photo for the cover or back, because my daughter, Ashlee, had just drawn her impression of the Fugitive Blonde on her Mac. She had produced two drawings; one for the cover and another for the back of the CD. Some image shuffling and text typing produced the results you see here.

What to Make of All This

Well, in the span of a week, I was the record producer, the mastering engineer, the CD plant, the record company president, and the entire art department. It showed me that if you play with your high-tech toys enough and learn how they work, they can help you create things that give you just a little edge on the next guy.

If you want to produce more than 10 or 20 CDs, then this method becomes a little expensive. You won't make much money producing CDs at $20 each and selling them at $14 each. But, that is how I live. Lose money on every deal, but make it up in volume.

The CD you just made can be used as a master to send to the CD plant, and your artwork can be used to mass produce the CD booklets. There are many CD plants that will crank out 1000 CDs for about $1.80 each, including the booklets. You're in business now!

By the way, the Fugitive Blonde demos sounded so good after all of the clean up and mastering, that all of the record companies that saw the Fugitive Blonde package and heard the CD thought that it was a finished product already with a record company. One of them wanted to know how much it would cost to get Fugitive Blonde out of her current contract. Well, let's see. A Power Mac, a Kodak dye sublimation printer, Aldus Freehand, a color scanner, a digital camera, Macromedia Director, some video hardware, morphing software...

One Last Technical Bitchenness

Usually I submit my stuff to *EQ* through CompuServe. Because of the Photoshop pictures, the total amount of data was 70 MB. Overnighting a SyQuest was considered, but my SyQuest is only 44 megabytes so it would have taken two of them at about $50 each. So what did I do? I submitted my article on CD-ROM. I had plenty of room to spare, and it only cost me $10 for the blank CD. I think I can chalk that up as another first for Gear Sluts. TTFN (Ta Ta For Now)

Note: Roger Nichols has since purchased a copy of Adobe Photoshop 3.0 and a copy of Adobe Illustrator 5.5 so that he doesn't have to worry about the Copyright Police reading this article. EQ

UNSUNG HEROES

continued from page 101

gic development. Gander holds an MSEE from the Georgia Institute of Tech and is a governor of the Audio Engineering Society.

Gander explains what he feels people are looking for from loudspeaker manufacturers: "JBL is one of the oldest brands known for high-end loudspeaker systems, but having that kind of technology is not enough. JBL users are not just sound engineers and musicians. They are people who need to deliver a message, including, religious representatives, teachers, and public speakers. These people want the engineering expertise offered by JBL that allows matching of components without guesswork. By talking to these people and finding out what they want, we were able to develop the new EON system as an audio solution. It works as a package, offering the best of our technology in the most simple to use package possible. A teacher who needs to address an auditorium full of people does not want to know about foldback or auxiliary sends, and this is why JBL offers a 'speech' version of the EON mixer. It is our job to make the highest possible technology accessible to the masses."

JBL's Mark Gander

This philosophy is certainly evident in the EON system, which comes as close to a "PA-in-a-box" as any audio system ever has. Gander notes that the EON speaker cabinet (which contains built-in amplification) can even take a microphone input and amplify it without the use of an external mixer.

While all of this new technology certainly includes the use of new materials, Gander concurs with Howze's opinion regarding loudspeaker design. He explains that although JBL's drivers were revamped for the use of Neodymium, the design process is generally one of evolution, not revolution. "Using materials like Neodymium allows us to make drivers lighter, but loudspeaker design has been incremental refinement. Right now, the best way to move air is to use a cone or diaphragm and a coil of wire. Some day we may figure out a better way of exciting air molecules into making sound, but right now, that's it. Technology is great but people must want the product. Appropriately applied technology is the key to survival in the next century."

Stay tuned for the next issue when we will speak to loudspeaker designers Ed Long and Kenton Forsythe (EAW). EQ

World Radio History

TRYCHO TUNES

PERFORMANCE SEQUENCES™

MIDI MUSIC WITH THE HUMAN TOUCH !

The most widely used midi sequences in the world. First in customer satisfaction for over six years. Over 3,000 song titles available for any musical application. All programmed in LA for consistent top quality by Stephen Kern.

From Pop to Rock. From Country to Standards to custom programming, we've got it all!

Trycho sequences are available for most popular computer and hardware based sequencer systems. We even have stereo audio cassette and DAT versions for non-sequencer users. We're the only sequencing company authorized as a dealer for the equipment we support. For you, this means great sequences, fast setup, access to the best midi hardware, comprehensive technical support, and fantastic overall service six days a week - year in and year out.

So whether you're involved with audio production, multimedia presentations, are a hobbyist or a professional musician in a solo, duo or trio act, you can count on *TRYCHO TUNES* for the absolute best in midi sequences.

***TRYCHO TUNES* Performance Sequences ... there's *NO* competition!**

***TRYCHO TUNES* are available at many fine music & computer stores. Or order direct at:**

VISA **1-800-543-8988** AMERICAN EXPRESS CARD

MasterCard 2166 W. Broadway St. • Suite 330 • Anaheim, CA 92804 DISCOVER

Technical Hotline (909) 696-3577 • Fax (909) 696-3571

CIRCLE 71 ON FREE INFO CARD

Sound Bytes

New sound releases for ENSONIQ instruments Vol. 1

ASR SERIES TS EPS 16 PLUS **Sampled Sounds on CD-ROM**

Here's just a few of our many new CD-ROMs, providing fast access, logical organization, and great sounds!

CDR-4 *"AS Archives"*
AS-1 through 14 plus many bonus sounds on one budget-priced disk. $99.95! *Ask for our AS library audio demo CD (CDA-3) – only $4.00 S/H.*

CDR-6 *"Best of Sonic Arts"*
Vintage R&B and rock instruments. $199.95

CDR-7 *"Jason Miles Psychic Horns"*
Stellar R&B/funk horn riffs and swells. $199.95

CDR-14 *"Analog/Digital Synth Resource"*
A definitive collection of synth sounds. $199.95.

Budget collections from InVision Interactive — *only $99.95 each!*

CDR-8 *"Classical"* CDR-11 *"Keyboards"*
CDR-9 *"Ethnic"* CDR-12 *"Drums"*
CDR-10 *"Pop/Rock"* CDR-13 *"Percussion"*

For more information, or to order call (800) 553-5151.

ENSONIQ™ LEADING THE WORLD IN SOUND INNOVATION

CIRCLE 34 ON FREE INFO CARD

TWO TRACK

continued from page 58

Make any adjustments needed and re-record. You'll have to whip the band into shape because you can't fix mistakes by punching in, but you can always do another take.

STEREO MIKING PROCEDURE

When you stereo mic a classical ensemble, try to record in a venue with good acoustics. Set up two identical mics on a stereo bar, or use a stereo mic or dummy head. Place the mic stand about 5 to 15 feet in front of the front-row musicians and raise it about 14 feet high (fig. 3). Run a long pair of mic cables to your recorder.

As the group rehearses, monitor the input signal. If the sound is too edgy, dry, or detailed, move the mics a foot or two further away and listen again. If the sound, however, is too distant and muddy, move in a foot or two. Try to find a spot where you hear a pleasing blend of the group and the hall acoustics.

Ask the group to play the loudest part of the music. Set the recording level to peak at +3 max (analog) or -3 max (digital), then leave the level alone. If you use good mics, you'll be amazed at the realism and purity of sound you can get with this method. EQ

OUTBOARD A/D CONVERTERS

Built into every DAT recorder is an analog-to-digital (A/D) converter. It changes the analog signal coming from your mics or mixer into a digital signal that's recorded on tape. To save cost, the A/D converter might be less than superb in quality. So you might prefer to use an outboard A/D converter, such as those made by Apogee or Wadia.

Outboard units tend to sound better. They have less jitter (timing errors), so they reproduce the audio waveform more accurately. Sophisticated design in the converter and analog circuits helps to make the sound smooth, gentle, and open. One new system is claimed to sound as smooth as analog: the HDCD system by Pacific Microsonics.

World Radio History

Test Drive A Real Performance Machine!

Come on you control freaks. Don't just kick the tires and walk around it.

Do It!

Grab the controls.

Drive it hard, to the point you fear it's going to come out of the groove like the others.

But it doesn't.

It hangs right with you begging for more.

Throw it around the curves, easily gliding out of the rough and right into the sweet zone.

And when you stop - it's silence. Pure and beautiful.

You look around the controls. Everything is laid out neat and logical - right where you want to put your hands. Nothing superfluous, just the basics needed for professional driving. Every control is silky smooth and even the switches light. And while it's easy to drive, this elegant application of high tech allows you to explore places you've never been before. It's the perfect companion for a home project room - but it's equally at ease taking abuse on the road in front of a crowd. It's expandable too, if you need to carry more inputs or more buses. You can even order up a complete option package, allowing you to customize it for your tastes.

Then the light bulb above your head dawns and the adrenaline kicks in. This is NOT like the other machines.

This one lets you connect to your music like never before. Push it, feel it, move it, drive it - easily and artfully. Great sound, control, and driving excitement. After all, isn't that what this is supposed to be about? And when the salesperson tells you it starts at a base sticker price of under $2000*...

But then again, what else would you expect from the company that helped invent rock & roll?

The MX-5200 mixing console system from Fender Pro Audio (available in 16, 24, and 32 input versions, plus options).

Fender®

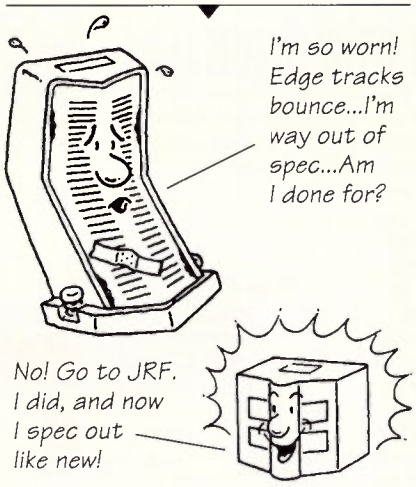
ELECTRONICS

*M.S.R.P. for 16 channel version. Does not include applicable local taxes, licenses, or dealer prep charges. Concert rig courtesy of Spectrum Audio. ©1995, F.M.I.C. For more information, send $2.00 postage and handling to: MX-5200, c/o Fender Pro Audio, 7975 N. Hayden Rd., Scottsdale, AZ 85258.

CIRCLE 78 ON FREE INFO CARD

World Radio History

TALKING HEADS



▶ HEAD RELAPPING
▶ OPTICAL ALIGNMENT
▶ NEW REPLACEMENT HEADS

JRF MAGNETIC SCIENCES
(201) 579-5773
Fax (201) 579-6021
249 Kennedy Road, Greendell, NJ 07839

CIRCLE 91 ON FREE INFO CARD

WHAT DO AEROSMITH, GARTH BROOKS, & U2 HAVE IN COMMON?

Someone Had To Record Them.

It might as well be you. Right now there are thousands of good paying jobs in the music industry for quality audio engineers and assistants. But no one can just walk into a major recording studio and ask for a job. The audio recording industry demands specialists. Call us today at 1-800-562-6383 to find out how, in just a matter of months, we can give you the training you'll need to get that exciting first job. Call today.

CONSERVATORY OF Recording Arts & Sciences
1110 East Missouri, Suite 530
Phoenix, Arizona 85014
1 800 562-6383

CIRCLE 93 ON FREE INFO CARD

MASTERING VIEW

continued from page 66

8. Come prepared. Make sure all documentation, shipping instructions, and sequencing are complete before you get there.

Sequencing (the order that the tunes appear on the CD, cassette, or record) is especially important, and doing this before hand will save you a bunch of money in mastering time. Many engineer/producers have the mistaken impression that once the final mix is over, it's off to the mastering studio. There should be one additional session, however, known as the "sequencing session." This means that you take a day of studio time (it can be in a cheaper studio or a DAW suite if cost is a factor) to do any editing that is required. This is really important if you will be releasing in multiple formats such as CD and cassette since they will probably require a different song order due to the two sides of the cassette.

Make sure each tune is cleanly edited and leadered if on analog. If on DAT, make sure that each song is properly ID'd, the tape is rewound, and the record tab is in a locked position (can't record).

9. Have your songs timed out. This is important for a couple of reasons. First, we've got to know how long a master tape or CD-R to use. CDs have a total time of just under 80 minutes, and 3/4-inch U-matics come in either 60- or 80-minute lengths while CD-Rs are available in 63- or 74-minute lengths.

10. Records may be around for a while (but in limited quantities), so the following applies if you intend to cut vinyl. Cumulative time is important because the mastering engineer must know the total time per side before he or she starts cutting due to the physical limitations of the disc. You are limited to a maximum of about 25 minutes per side (hopefully less) if you want the record to be nice and loud.

Make sure all of the songs of a side are on a single reel. Unlike doing CD prep, once you start to cut a disc, you can't stop. You should ideally come to the studio with a Side A reel and a Side B reel that's been leadered and sequenced (or a sequenced DAT).

Don't mix formats. In other words, if you begin mixing to 15 ips 1/2-inch 2-track with Dolby SR, don't make the next tune 30 ips nonDolby, and then the next off of a DAT. This is not critical when prepping for a CD, but will save time changing machines around and rental costs.

Above all, remember: The mastering engineer is our friend! Learning to take advantage of this valuable resource is one of the best ways to make our final project sound the best that it can. EQ

THE NEW MASTERING HOUSES *(cont'd from 63)*

their greatest work. That is what we strive to do. We have one singular goal: to make it sound better!

For example, a producer brought in a radio ID package and was very frustrated that the client-approved vocal level had obliterated most of the musical nuances he had worked so hard to achieve. Within an hour, the musical details he thought no one would ever hear again were brought back to life. We also made the vocals clearer, made the bottom end punch like he wanted, and added the shimmer that was lacking in the final mixes. Another record company executive called after we finished mastering an album for him and said, "You made it sound like we spent four times as much on this album."

Photo by Martin E. O'Connor Photography

To many artists, producers, and musicians, the term "project recording" means one thing — freedom. Scheduling freedom, budgetary freedom, freedom to make whatever time is necessary to get it right. Freedom to make your own music the way it needs to be. Project mastering at 3D Audio means taking the time to make it sound the best it possibly can. Our goal is to enable artists to make better sounding records by using the latest technology and providing a comfortable relaxed environment where they know they are working with people who realize that their *music* is the important thing.

—Lynn Fuston and Mike Haynes

World Radio History

In this age of digital audio, the "golden oldie" processors of yore don't cut it, with their excessive coloration, high noise levels and poor resolution. Nor does the waning breed of studio multi-effects, with their swiss army butter-knife, blah-for-the-buck limitations. The project studio producer/musician must answer to the increasing sonic awareness and demands of the digital age. RSP Technologies understands and embraces this with a line of processors specific to the audio and economic realities of the project studio. From our revolutionary **Circle Surround**™, to the flexible **Intelliverb**™ and the incredible **Reanimator**™, RSP makes the project studio a paradise of processing.

Intelliverb's Virtual Room™ allows you to go where your imagination takes you, a tremendous panoply of reverbs, cutting the edge in the project studio. This verb lets you program not only room size, but the location of the sound source in the room **and** the listener's position. Craig Anderton in **EQ** said, "it looks as if RSP has come up with a winner for project studio owners". **HS & R**'s Nick Batzdorf wrote, "the Intelliverb sounds so good that I'm now disenchanted with the four other effects processors in my studio!"

Nothing new in compression? There is in paradise. Check out the new **Reanimator**™ from RSP Technologies. Rather than settling for a loss of high-end normally caused by compression, the **Reanimator** actually allows for selective replacement of high-end loss with its unique **dynamic enhancement**. The **Reanimator** precisely tracks the amount of compression being used, (enhancement is not added when no compression is taking place), resulting in an unadulterated mix, with no added noise. A compressor of the highest audio quality, providing the most natural sounding dynamics control possible.

Need help with monitoring capabilities while tracking? The **Emphasis**™ is Paradise found! RSP's unique headphone distribution system offers tremendous flexibility. Each participating musician can set up his own headphone mix for the ultimate in personal monitoring capability. Handle your ever-changing monitoring needs with the best project studio headphone amplifier!

Send $3.00 (shipping and handling) for your RSP Technologies **Project Studio Processing** catalog. Put your studio in paradise!

RSP Technologies

Intelliverb and Reanimator include HUSH® noise reduction licensed by HUSH SYSTEMS®

2870 Technology Drive • Rochester Hills, MI 48309 • (810) 853 3055 Fax (810) 853 5937

CIRCLE 95 ON FREE INFO CARD

Photo by Martin E. O'Connor Photography

World Radio History

Site Selection for Studios

When constructing a studio, it's a good idea to have a building to put it in...

BY JOHN STORYK

Certainly one of the primary issues that a studio designer — and the studio owner — has to come to grips with is *the site.*

Quite simply stated, site selection is a critical decision in facility design. Compounding the problem is the fact that it usually has to be made quite early in the project, requiring a financial commitment often before all aspects of the project's design development are completed. What, then should we be looking for?

FLOOR AREA

This certainly should be the first analysis. Does the site give you enough floor area (project footprint) for the facility program? Of course, this requires an architectural program. Don't skip this step. Countless sites have turned out to be inadequate because they were *just too small!*

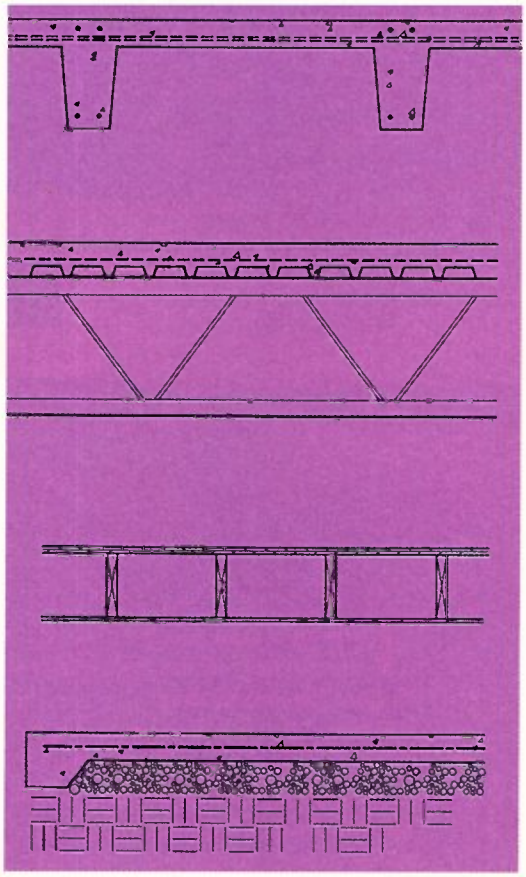
Here are some Simple steps for creating an architectural program:

1. List all primary program elements. Again this appears simple, but don't leave out any program elements.

2. Add to the list all support spaces, including mechanical spaces, storage, etc. These spaces are important and are required. They are often the ones that are forgotten.

3. This resulting total floor area (square feet or meters) is the *net floor area.* You now need to account for construction thickness, as well as circulation. At this point in the project's development it is typically impossible to completely develop these values. It is difficult to design real spaces, thus a multiplying coefficient can be used. I would use a conservative figure of 20 percent of the net floor area as an additional program element. Acoustic walls are quite thick — 1 linear foot of a studio wall can require 1 to 1.5 sq. ft. of floor area. An efficient design can sometimes be measured by a lower value of net to gross floor area. The larger the project, the lower this ratio will get. The inverse is also true — smaller projects will require a proportionally larger amount of circulation and construction floor area. This total will now result in the *true gross floor area,* or required site area, for the project.

Remember that floor areas in commercial rental properties are often quoted in terms of "rentable square footage." This may not be the actual square footage.



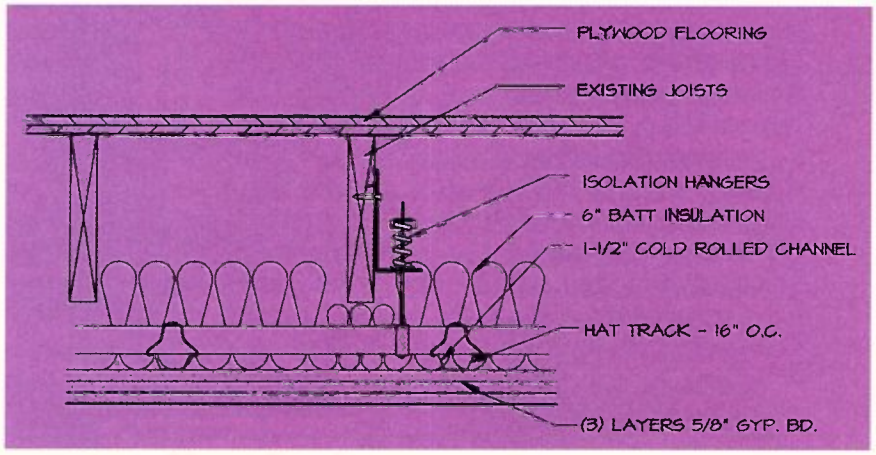


FIGURE 1: Building Structure Types (horizontal structure). From top to bottom: steel reinforced poured in place concrete structure; steel reinforced poured concrete over metal decking and open web-steel joists; wood joists system with wood decking; steel reinforced concrete slab on grade.
FIGURE 2: Typical Studio Isolated Ceiling Structure — weight can be 10#/s.f.

World Radio History

CAN YOUR ACOUSTIC GUITAR AMP PASS THIS ORAL EXAM?

The Fishman Acoustic Performer Pro. You've Never Heard Anything Like It.

Sing? Through a guitar amp? That's right.

You see, there's one thing the human ear is critically tuned to recognize. The human voice. So if your voice, through an amp, sounds unnatural or colored in any way, you'll know it. And if it sounds clean, smooth and tonally correct, you'll know something else. You're singing through the new Acoustic Performer Pro from Fishman.

But don't stop there. Plug in your acoustic guitar and you'll be doubly impressed. The Pro was designed from scratch to deliver pure, clean acoustic sound with surprising kick. More than you'd expect from a guitar amp. But the Acoustic Performer Pro is more than just a guitar amp. It's the beginning of a new category in performance amplification.

A studio-quality system, the Pro provides all the power you'll need to sing and play to a club of 100 or so. Plus the inputs and outputs needed to use the Pro as a personal monitor in a larger venue. And all of the mixing and effect options to get your sound just right for a studio set-up.

In fact, the Acoustic Performer Pro out-plays systems two or three times its size. And twice its price.

There's more. Unfortunately, there isn't more space here to tell you about it. To get the complete story and a list of dealers, call (508) 988-9199, extension 101.

This concludes the written portion of the exam.

The 270-watt RMS, two-channel Fishman Acoustic Performer Pro performance system and optional Acoustic Monitor Pro extension monitor/amplifier.

FISHMAN®

CIRCLE 96 ON FREE INFO CARD

World Radio History

EXISTING BUILDING OR GROUND UP

Naturally a "ground up" structure will usually afford you more possibilities for design and acoustic accuracy than an existing structure. Typically the option for a new building does not exist — particularly in cities and in residential project studios where either economics or actual site conditions simply do not permit new construction. New buildings allow studio area and heights to be designed rather than compromised. New construction also permits a greater variety of sound-isolation techniques. If all other considerations are equal, a new building is usually always preferred. Assuming that you have not yet reached the point of being able to afford the luxury of constructing a new "ground up" building, we will continue with the site selection process evaluating existing real estate.

BUILDING STRUCTURE

The next important issue is the structure of the building shell itself. This will have the largest impact on the transmission acoustics of the project, once the ambient noise of the surrounding environment has been adequately studied. Horizontal structural elements are typically more critical than the walls of the studio property. There are usually only four major types of building construction (see fig. 1). Here are some more tips:

1. Constructing a studio is usually more economic in a "slab–on–grade" structure. There will typically be more efficient ways to create isolated or acoustically "decoupled" rooms, resulting in required studio isolation. An exception to this would be if a grade-level studio installation put the facility so close to a community noise source that the isolation technique savings were outweighed by other noise abatement techniques.

2. A stand–alone building is usually preferable than a shared tenant space. Neighbors make noise. For that matter, they can cause other problems as well. Again, there are exceptions. I have seen very rainy climates, where the rain noise on the roof was much greater than a quiet upstairs neighbor.

3. Check load capacities on horizontal structures. Commercial studios need floor and ceiling live loads that are typically greater than residential. Try to have at least 60 #/s.f. live load for a floor and have a ceiling that can accept an additional live load of 15–20 #/s.f., particularly where there is a likelihood that a suspended ceiling skin of some sort will be required. The skin alone could weigh 10 #/s.f. (see fig. 2). I have seen a number of larger studios in warm climates, such as Florida, run into this problem, since roof structures will typically be very light, not being designed for snow loads (see fig. 3).

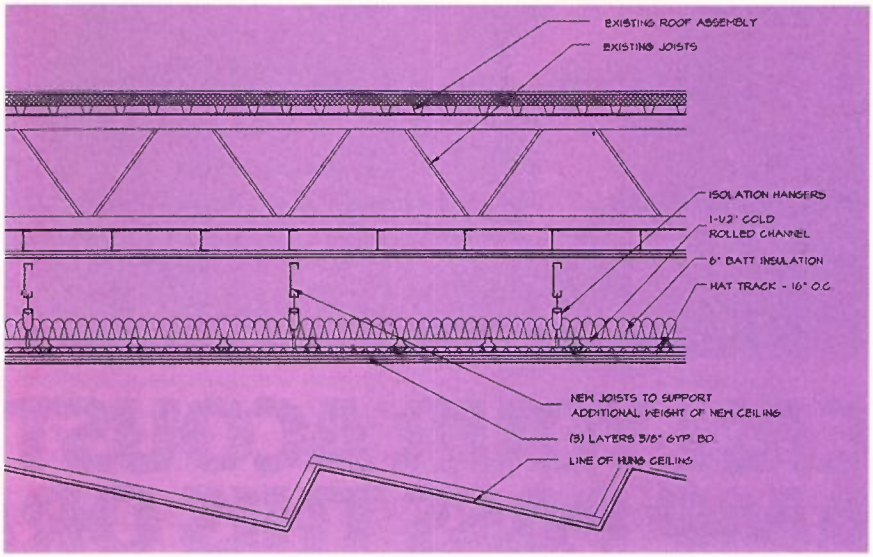


FIGURE 3: Warm climate roof structure.

NOISE & NEIGHBORS

Most studios have neighbors one way or the other. Neighbors can disturb a studio, studios can disturb neighbors, or both conditions can exist. Studios generate noise and at the same time require very specific levels of quietness. These noise generation and quietness sound pressure levels are not a function of neighbors — they are a function of studio program requirements. Quite simply stated, the less noise in a studio's "neighborhood," the less transmission isolation will be required. Satisfying transmission loss (studio isolation) is expensive. Like most calculations in the sound world, as sound transmission requirements increase, required construction cost dollars increase logarithmically.

For a typical studio facility (with a control room and a live recording room), there will be a minimum transmission value for the control room/studio recording room boundary. Typical values for this will be about 55 STC (sound transmission class). Thus, having quiet community noise levels that will result in a lower STC value for the basic studio boundary construction will have little or no economic value. Here are even more tips:

1. When measuring community noise levels (to begin transmission loss analysis), make sure to make measurements during hours that give meaningful results.

2. Often the most extreme transmission/quietness requirements are from your studio itself. Fig. 4 shows the partition providing over 75STC between two adjoining studios, which is required for simultaneous operations with two different clients.

3. Try to make octave-band sound level measurements for determining community noise levels as well as quietness readings (Noise Criteria). Often the transmission loss requirement for one octave band is the most critical.

UTILITIES – POWER AND HVAC

Studios require electricity and HVAC (construction industry acronym for heating, ventilation, and air conditioning). An obvious check for power capacity is an automatic site inspection must. Interestingly enough, gross studio power requirements have not increased during the past 10 years — if anything, they have decreased. I have rarely seen a reasonable commercial studio site that did not have or could not acquire the required power for a studio installation. HVAC is a slightly different issue. Here are some HVAC site issues:

1. Studios require lots of ducts. Speeds have to be quite low, so duct sizes must increase. There is little room for faking this. To make things

World Radio History

EQ SHOPPER

Sound Advice

From: John Agnello - Bob Barry - Bearsville Studios - Ray Benson - Big House Studio Bismeaux Studio - Joe Blaney - Scott Boorey John Cale - Rick Chertoff - Joe Chiccarelli - Mark Egan - Seth Glassman - Tom Jung - Bob Khozouri Dave Kirkpatrick - Cedric Lee - Stewart Lerman Mark McKenna - Mark Mason - John Siegler John Siket - Sound Techniques - Dave Thoener Butch Vig - Waterfront Studio - William Wittman

They Use It ... They Love It
Hear It For Yourself

The 52270 Mic-Pre/Equalizer

- Two 52270 MicPre/EQ's
- 4 space road case
- Power supply

Complete.....$2395.00

Available Through:
AudioTechniques .... New York
Cutting Edge Audio Group .... San Francisco
Professional Audio Design .... Boston
Ray Benson's Bismeaux Studio .... Austin
or direct from ....

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

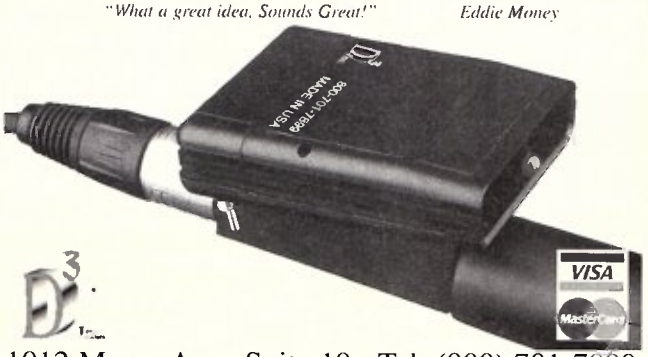
CIRCLE 38 ON INFO CARD

Look Ma, No Hands!

Introducing the **IR1**, the world's first automatic microphone switch. The **IR1**'s body sensing technology keeps mics off until performers are within an adjustable range. Now you can mute unwanted sources of stage noise & feedback, increase system headroom, & clean up any mix without using your hands! The simple to use, compact and affordable **IR1** is compatible with most mics. Call and order the **IR1** today, in singles or our handy six-pack.

"This innovation truly provides a large improvement in a live mix for a very small price." Geoff Ganiford, FOH Eddie Money Band

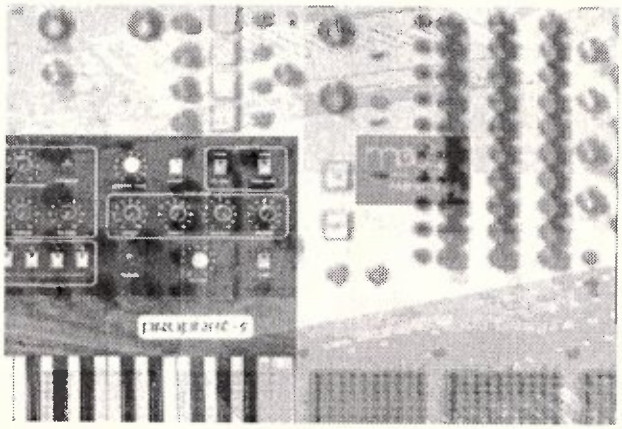
"What a great idea. Sounds Great!" *Eddie Money*



1012 Morse Ave., Suite 19 Tel: (800) 701-7899
Sunnyvale, CA 94089-1634 Fax: (408) 745-7897

You Work the Audience...We'll Work the Mic!

CIRCLE 22 ON INFO CARD



Echo Park Music & Sound
P.O. Box 486
Park Ridge, N.J. 07656
Tel: (201) 930-9660
Fax: (201) 930-9678
CompuServe 76512,227

Authorized Dealer For Most Major Brands
New and Used Equipment
Vintage Equipment / Analog Keyboards
Expert Repair Service
Call For Our Free Catalog Or Inventory List

CIRCLE 32 ON INFO CARD

SoundHead

P.O. Box 486
Park Ridge, N.J. 07656
Tel: (201) 930-9660
FAX: (201) 930-9678
CompuServe: 76512,227

Sample Disk Libraries
Sound Cards
CD-ROMS & Sample CDs
Support For Kurzweil K2000 / K2500, Roland S760, JV-Series, JD-990, SoundDesigner II, E-mu ESi-32, Akai S1000 / S3000 & Ensoniq ASR10

Specializing in sample disk sets of analog synthesizers and drum machines. Only from the original machines, patched and looped to perfection. All the inherent qualities of your favorite old synth - in perfect pitch.

Call For Our Free Catalog

CIRCLE 32 ON INFO CARD

World Radio History

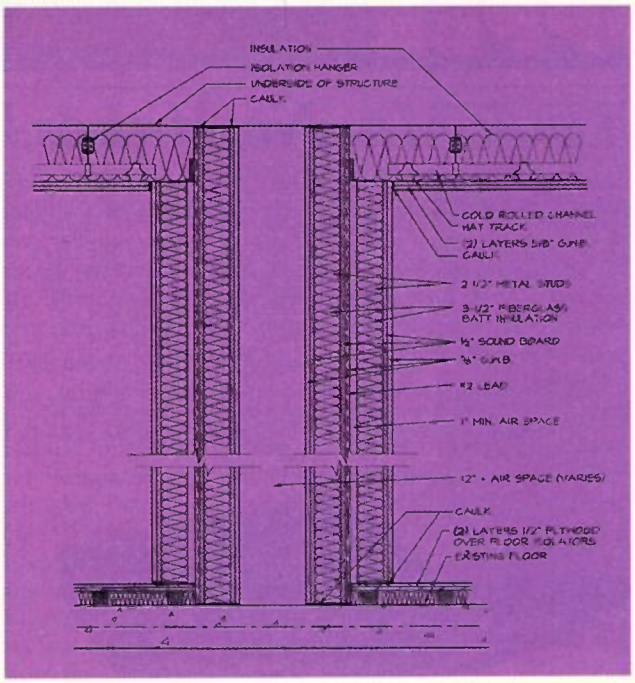


FIGURE 4: Partition detail between Studio East & West — Howard M. Schwartz Studios, New York City.

worse you need to have positive return air ducts. All air that goes into an acoustic space must be ducted out. Headroom becomes very critical. If the program requires large spaces and/or lots of heat, then headroom is critical. Less than 10 feet clear becomes a problem.

2. Try to imagine where the units will be located. If there is a possibility for a split system (remotely locating the compressors), this is usually an advantage. This does, however, require an increase in the fresh-air ductwork. Studio sites where there is good access to a roof is usually an advantage.

3. If you are required to completely house the HVAC components of the project within the space, make sure to include additional floor area for HVAC room(s). It would not be uncommon to need 300–400 square feet for such a room.

4. HVAC equipment makes noise. Locating this equipment away from final user rooms is usually an advantage, although too far away, this will increase the static in the duct runs, thus increasing the size of the ducts. A combination of these two solutions, plus creative duct layout design solves the problem. Again, try to imagine an HVAC room or HVAC location scheme early in the site selection process.

EGRESS

Studios will usually have expanded requirements for access, deliveries, and general egress. In choosing a site, think about how certain materials will move in and out of the studio.

Some questions to answer:

1. Will construction materials be able to arrive and moved conveniently onto the studio site? This question often needs to be asked in nonground level, multiple tenant sites.

2. If the building site is not on the ground floor, the issue of elevators becomes critical — not only for day to day activities, but during construction.

EXPANSION

No matter how thoroughly one plans a facility, it routinely seems that you run out of space in the future. It is very difficult to plan for the future. When choosing a site, try to choose one that has some sort of expansion capability. More tips:

1. If the site is a stand–alone building, confirm that the property and the zoning will allow additional building floor area. It is very important to confirm that additional required parking will also be available. In a recent project in our office, the final size of the studio was ultimately limited by "on–site" parking capacity.

2. Confirm that if an expansion takes place, there would be additional power capacity in the building.

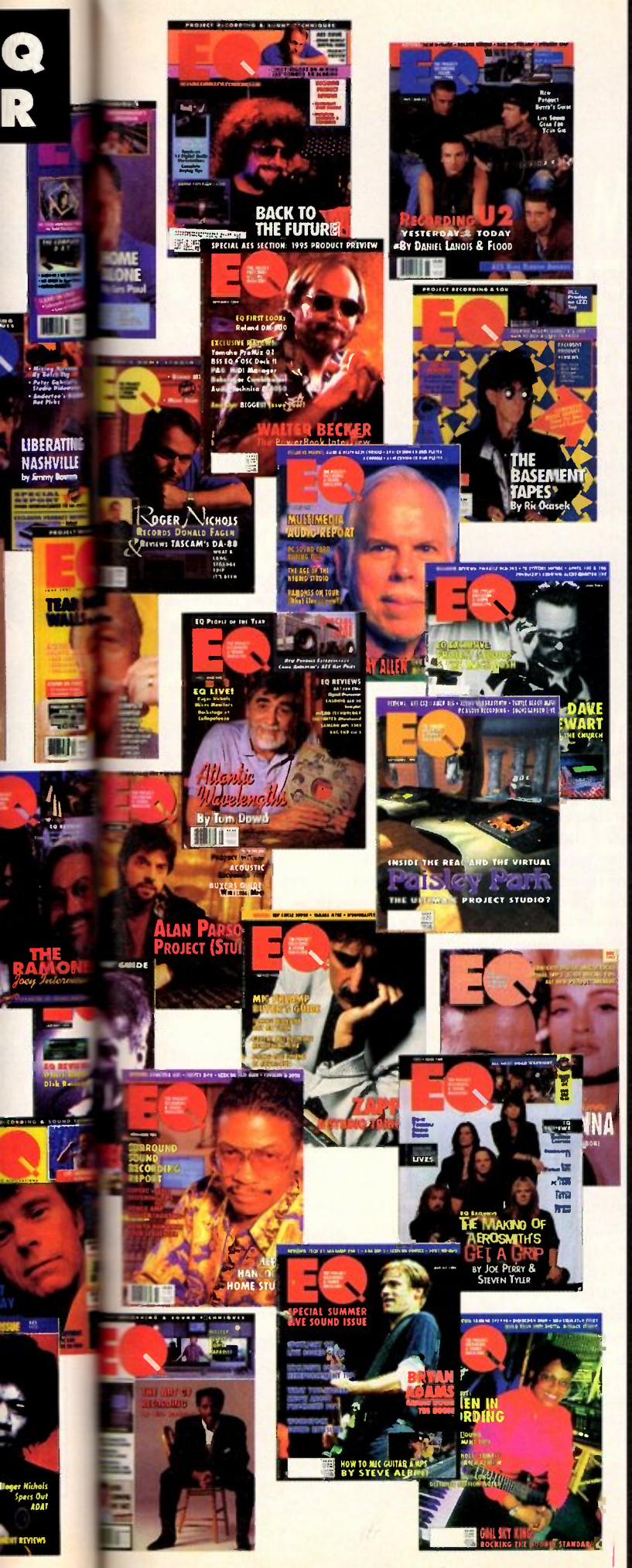
3. In a multitenant building site, particularly a site in expensive commercial property, having options and first right of refusals on adjoining spaces is recommended. The first right of refusal technique is an economic method of somewhat controlling your future space requirement destiny in an existing location.

4. Future expansion can also take place vertically.

BOTTOM LINE

Site selection is time consuming and very often quite frustrating. Extra effort at this stage of studio design will be well rewarded. The least expensive rent or purchase price is not always the most economic site. Good luck searching for that perfect studio site. EQ

World Radio History



THIS IS EQ ON CD-ROM

Thirty valuable back issues on a single CD-ROM. An EQ library.

All the tips, techniques, products, reviews and opinions — from the industry's leading experts. All easily sorted by any word, manufacturer, name, or columnist. All the reviews. All the products. Fully indexed, searchable and available at a click of your mouse.

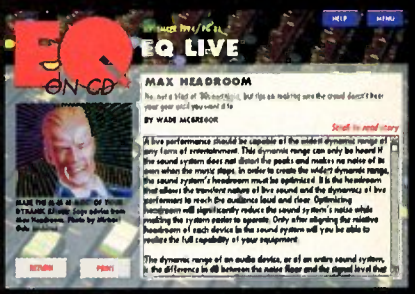
EQ ON CD. The ultimate project studio resource.

EQ ON CD works with either Mac (LC or higher) or Windows (386 & VGA min.) computers.

Over $100 worth of magazines for only:

$19.95

Order today



Please Note: EQ ON CD will begin shipping in April. Actual product may differ from screens pictured. Supplies will be limited. So order now.

☐ Yes, send me my copy of EQ ON CD for only $19.95!

I use a ☐ Mac ☐ Windows computer. Type: _____

Name _____

Address _____

City _____ State _____ Zip _____

Signature _____

Payment Method: ☐ MC ☐ Visa ☐ Amex ☐ Check Enclosed

Card # _____ Exp. Date _____

Mail to: EQ ON CD, c/o PSN Publications, Inc., 2 Park Avenue, New York, NY 10016

World Radio History

Death And Taxes

Both are inevitable, but with some smart planning one of them can be made to work for your own advantage

BY MARTIN POLON

A studio owner was recently commenting about the impact that taxes had reaped upon his operation. "Death and taxes — choose between the two. At least, death isn't as permanent."

Taxes do not have to be a permanent downside factor to the recording studio owner/operator who learns to use the tax system to support his or her status as a small business operator. What is required is some simple dedication to learning the tax system and then using it properly — just as you would a new digital mixer.

1. Keep accurate records. You would be amazed at the number of personal and project studio owners who still keep all their records on slips of paper in a shoe box. What is needed is a standard ledger available at any stationary store and a small expenditure of time daily to log any income and any expenditures.

2. Save all sales receipts, no matter how small. Most studio owners cheat themselves by treating parts and equipment expenditure receipts as expendable — especially small ones. What happens to one $3.25 receipt may be inconsequential. But a year full of such receipts may add up to $500 or more.

3. Utilize the "one-time write-off" rule to write down capital purchases. Any capital item purchase or group of large items coordinated towards the same use or several separate capital items can be written off in the same year as the purchase was made in, as long as the total purchase(s) does not exceed $17,500. For example, a new digital mixer, an 8-track digital recorder, and a multieffects box totaling $16,000 could be written off completely in the year of acquisition. In the following year, another $17,500 could be written off and so forth and so on.

4. Amortize larger purchases over time. Purchases that exceed the one-time write-off limit can be expensed over a given time frame of three, five, or seven years. The point of all of this is that a personal or project studio owner/operator can utilize the support Congress wrote into the tax code for small businesses to add to their capital equipment base. A new mixer, a hard disk recorder, or a digital multitrack tape recorder can all be within the reach of many studios if the provisions of the tax code are used to deduct the cost of the purchase from income.

5. Protect personal/project studio tax status via isolation. As a "home" business, the studio must have an isolated status that has no other relationship to the family that lives in that home. The space dedicated to the studio that is specified by the process of taking a "home office" deduction should have no other use and no materials either stored or used in that space. In other words, do not expect the Internal Revenue Service (IRS) to sanction a home office write down for your studio if your wife's sewing room and your universal gym shares the space. Separate buildings or garage studios make the IRS happy about this category.

6. Do not run a hobby business. If your personal or project studio does not show a profit over a given period of years, the Internal Revenue Service will look askance at large scale write offs for equipment over the same extended time period. There are some tax consultants who argue that as long as the money-losing entity is the only business operated by or employing the tax payer, then it is not a hobby business. If, however, there is a full time job or other business, the project studio indeed begins to look a great deal like a hobby.

7. File on time. Late filing can and usually does increase the probability of audit — and an audit is to be avoided at all costs.

8. Always (and I mean *always* report all income. Without fail report *all* income. You do not want to become a federal felon or, as is more likely, to be in the category of permanent audit every year that you file a federal tax return. (Yes, it can happen to you.) Of course, none of this mentions the cash penalties, back interest, and principle due for hiding the income in the first place.

9. Use a professional tax preparer. Whatever one might save in doing one's own taxes — whether via a computer tax program or the old fashioned way — is false savings indeed. Your time as an audio practitioner is better spent on things acoustic and audible. Spend whatever is necessary for a professional tax preparer like a certified public accountant (CPA) and use your time to generate studio income or to improve your studio facility. The tax professional will not make the mistakes you might make and may well find you other categories of tax savings that you might not have found.

Martin Polon is the principal of Boston-based Polon Research International (PRI). PRI forecasts the electronic entertainment industry for the financial community.

World Radio History

EQ

DON'T MISS THE NEXT ISSUE! SUBSCRIBE!

SAVE OVER 50%!

Guarantee that you receive every issue of EQ by subscribing today! The newsstand is sold-out. The studio copy has disappeared. But you subscribe — and your personal subscription copy is still coming.

You can't afford to miss a single issue of EQ. Every issue is packed with products, reviews and valuable hands-on production techniques that help improve your recordings and live sound!

EQ
PO BOX 0532
BALDWIN, NY
11510-0532

EQ
DON'T MISS THE NEXT ISSUE!
SUBSCRIBE TO EQ & SAVE OVER 50%!

April 95//N

YES! I can't afford to miss the next issue of EQ.
Sign me up to subscribe for...

- ■ $24.95 for 1 year (10 issues), 37% OFF the cover price*
- ■ $39.95 for 2 years (20 issues), 51% OFF the cover price*
- ■ $59.95 for 3 years (30 issues), 51% OFF the cover price*

*Prices good in US only. US: 1 yr. $24.95, 2 yrs $39.95, 3 yrs $59.95; Canada add $10.00 per yr for surface; other countries add $15.00 per yr for surface; All add $30.00 per year for Airmail. VISA, MasterCard, American Express, or International Money Order only. Allow 4-6 weeks for delivery of first issue

Method of Payment: ☐ Bill Me ☐ Check/Money Order
☐ Credit Card: ☐ Visa ☐ MasterCard ☐ AMEX

Card# _____ Exp. Date _____

Signature _____

Name _____

Address _____

City _____ State/Prov. ____ Zip/PC _____

EQ
DON'T MISS THE NEXT ISSUE!
SUBSCRIBE TO EQ & SAVE OVER 50%!

April 95//N

YES! I can't afford to miss the next issue of EQ.
Sign me up to subscribe for...

- ■ $24.95 for 1 year (10 issues), 37% OFF the cover price*
- ■ $39.95 for 2 years (20 issues), 51% OFF the cover price*
- ■ $59.95 for 3 years (30 issues), 51% OFF the cover price*

*Prices good in US only. US: 1 yr. $24.95, 2 yrs $39.95, 3 yrs $59.95; Canada add $10.00 per yr for surface; other countries add $15.00 per yr for surface; All add $30.00 per year for Airmail. VISA, MasterCard, American Express, or International Money Order only. Allow 4-6 weeks for delivery of first issue

Method of Payment: ☐ Bill Me ☐ Check/Money Order
☐ Credit Card: ☐ Visa ☐ MasterCard ☐ AMEX

Card# _____ Exp. Date _____

Signature _____

Name _____

Address _____

City _____ State/Prov. ____ Zip/PC _____

EQ
DON'T MISS THE NEXT ISSUE!
SUBSCRIBE TO EQ & SAVE OVER 50%!

April 95//N

YES! I can't afford to miss the next issue of EQ.
Sign me up to subscribe for...

- ■ $24.95 for 1 year (10 issues), 37% OFF the cover price*
- ■ $39.95 for 2 years (20 issues), 51% OFF the cover price*
- ■ $59.95 for 3 years (30 issues), 51% OFF the cover price*

*Prices good in US only. US: 1 yr. $24.95, 2 yrs $39.95, 3 yrs $59.95; Canada add $10.00 per yr for surface; other countries add $15.00 per yr for surface; All add $30.00 per year for Airmail. VISA, MasterCard, American Express, or International Money Order only. Allow 4-6 weeks for delivery of first issue

Method of Payment: ☐ Bill Me ☐ Check/Money Order
☐ Credit Card: ☐ Visa ☐ MasterCard ☐ AMEX

Card# _____ Exp. Date _____

Signature _____

Name _____

Address _____

City _____ State/Prov. ____ Zip/PC _____

World Radio History

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO.680 BALDWIN, NY

POSTAGE WILL BE PAID BY ADDRESSEE

EQ

P.O BOX 0532
BALDWIN, NY 11510-0532

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO.680 BALDWIN, NY

POSTAGE WILL BE PAID BY ADDRESSEE

EQ

P.O BOX 0532
BALDWIN, NY 11510-0532

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO.680 BALDWIN, NY

POSTAGE WILL BE PAID BY ADDRESSEE

EQ

P.O BOX 0532
BALDWIN, NY 11510-0532

EQ

DON'T MISS THE NEXT ISSUE! SUBSCRIBE!

SAVE OVER 50%!

Guarantee that you receive every issue of EQ by subscribing today! The newsstand is sold-out. The studio copy has disappeared. But you subscribe — and your personal subscription copy is still coming.

You can't afford to miss a single issue of EQ. Every issue is packed with products, reviews and valuable hands-on production techniques that help improve your recordings and live sound!

EQ PO BOX 0532
BALDWIN, NY
11510-0532

World Radio History

EQ FREE PRODUCT INFORMATION

Use this FREE Literature Card to receive FREE information and brochures about products and services in this issue. Circle the numbers found in advertisements or editorial and you will receive brochures, buying tips and literature from EQ manufacturers absolutely FREE. Circle as many numbers as you need.

For FREE information and brochures follow these steps:

EQ

1 Print your name and address. **2** Answer all questions.
3 Circle all the numbers you need. **4** Mail this card today.

Name _____

Street _____

City _____ State ____ Zip _____

Tel _____

1. Check one category that describes your primary involvement in recording & sound:
01 __Musician
02 __Producer
03 __Studio owner
04 __Engineer
05 __Songwriter
06 __Educator
07 __Sound reinforcement
08 __Videographer/Editor
09 __Technician/Consultant
10 __MIDI Prog./Multimedia
11 __Record Company/A&R
12 __Pro Audio/Video Dealer
13 __Manufacturer/ Rep/Agency
14 __Other (Specify)
_____

2. Describe your level of involvement in music, recording and sound:
a. __Full-time occupation
b. __Part-time occupation
c. __Serious hobby
d. __Student
e. __Other (Specify)
_____

3. Check the one editorial section in EQ that is most important to you.
1. __New products
2. __Product reviews
3. __Techniques/Workshops
4. __Columns
5. __People profiles

4. Check one box that best describes your current investment in music, recording & sound equipment:
a. __Under $5,000
b. __$5,000 - $10,000
c. __$10,000 - $25,000
d. __$25,000 - $50,000
e. __$50,000 - $100,000
f. __$100,000 - $250,000
g. __Over $250,000

5. Check only one box to describe your budget for music, recording and sound equipment during the next 12 months:
a. __Under $5,000
b. __$5,000 - $10,000
c. __$10,000 - $25,000
d. __$25,000 - $50,000
e. __$50,000 - $100,000
f. __$100,000 - $250,000
g. __Over $250,000

ARE YOU AN EQ SUBSCRIBER? ☐ YES ☐ NO

ADVERTISEMENTS

01	02	03	04	05	06	07	08	09	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

EDITORIAL

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210

other _____

VALID THROUGH May 31, 1995 April 1995 Issue

For FREE information and brochures follow these steps:

EQ

1 Print your name and address. 2 Answer all questions.
3 Circle all the numbers you need. 4 Mail this card today.

Name _____

Street _____

City _____ State ____ Zip _____

Tel _____

1. Check one category that describes your primary involvement in recording & sound:
01 __Musician
02 __Producer
03 __Studio owner
04 __Engineer
05 __Songwriter
06 __Educator
07 __Sound reinforcement
08 __Videographer/Editor
09 __Technician/Consultant
10 __MIDI Prog./Multimedia
11 __Record Company/A&R
12 __Pro Audio/Video Dealer
13 __Manufacturer/ Rep/Agency
14 __Other (Specify)
_____

2. Describe your level of involvement in music, recording and sound:
a. __Full-time occupation
b. __Part-time occupation
c. __Serious hobby
d. __Student
e. __Other (Specify)
_____

3. Check the one editorial section in EQ that is most important to you.
1. __New products
2. __Product reviews
3. __Techniques/Workshops
4. __Columns
5. __People profiles

4. Check one box that best describes your current investment in music, recording & sound equipment:
a. __Under $5,000
b. __$5,000 - $10,000
c. __$10,000 - $25,000
d. __$25,000 - $50,000
e. __$50,000 - $100,000
f. __$100,000 - $250,000
g. __Over $250,000

5. Check only one box to describe your budget for music, recording and sound equipment during the next 12 months:
a. __Under $5,000
b. __$5,000 - $10,000
c. __$10,000 - $25,000
d. __$25,000 - $50,000
e. __$50,000 - $100,000
f. __$100,000 - $250,000
g. __Over $250,000

ARE YOU AN EQ SUBSCRIBER? ☐ YES ☐ NO

ADVERTISEMENTS

01	02	03	04	05	06	07	08	09	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

EDITORIAL

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210

other _____

VALID THROUGH May 31, 1995 April 1995 Issue

World Radio History

FREE PRODUCT INFORMATION

Use this FREE Literature Card to receive FREE information and brochures about products and services in this issue. Circle the numbers found in advertisements or editorial and you will receive brochures, buying tips and literature from EQ manufacturers absolutely FREE. Circle as many numbers as you need.

IMPORTANT:
AIR MAIL IF OUTSIDE THE US

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO.12522 CHICAGO ILLINOIS

CREATIVE DATA
650 S CLARK ST
CHICAGO IL 60605-9878

IMPORTANT:
AIR MAIL IF OUTSIDE THE US

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO.12522 CHICAGO ILLINOIS

CREATIVE DATA
650 S CLARK ST
CHICAGO IL 60605-9878

World Radio History

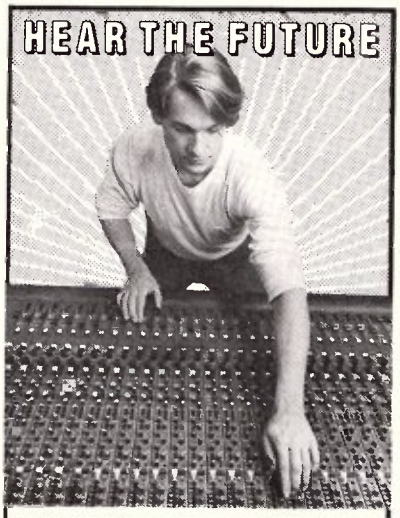
AD INDEX *For fast and easy information use the reader response card in this issue*

PAGE	BRAND	INFO#	PHONE#
35	3M	01	800-752-0732
84	Acoustic Science Corp.	02	503-343-9727
3	AKG	XX	818-893-8411
2, 9, 11, 49, 105	Alesis	03, 04, 05, 06, 07	800-5-ALESIS
47	Amek Systems & Controls	80	818-508-9788
13	Ampex	09	415-367-3809
57	Aphex	08	818-767-2929
83	Apogee Electronics	11	310-915-1000
12	Ashly Audio	13	716-544-5191
79	Audio Institute of America	14	415-931-4160
91	Audio Technica	15	216-686-2600
116	Audix	16	800-966-8261
25	BASF	10	617-271-4000
66	BBE	17	714-897-6766
73	Behringer	12	516-364-2244
94	Caig Laboratories	88	714-897-6766
44	Caruso Music	18	203-442-9600
141	City of Portland, Maine	20	800-874-8144
97	Community Light & Sound	21	215-876-3400
122	Conservatory Recording	93	800-562-6383
127	D-3 Inc.	22	408-745-7499
7	dbx	19	801-568-7660
117	Demeter Amplification	23	818-986-7103
99	DGS Pro Audio	24	800-292-2834
77	DIC Digital	25	201-692-7700
44	DIC Distributors	26	800-522-2732
72	Disc Makers	28	215-232-4140
21	Discount Distributors	29	516-563-8326
70	Drawmer	30	508-435-3666
33	E-mu Systems	87	408-438-1921
117	Ebtech	31	619-679-6510
127	Echo Park Music & Sound	32	201-930-9660
103	Electro-Voice	33	616-695-6831
51, 120	Ensoniq	27, 34	215-647-3930
121	Fender	78	602-596-9690
78	First Light Video Publishing	35	800-777-1576
125	Fishman Transducers	96	508-988-9199
59	Fostex	90	310-921-1112
63	Full Compass	36	800-356-5844
92	Full Sail	84	407-679-0100
43	Garwood Communications	94	718-383-5606
38	Genelec	37	508-435-3666
127	Geoffrey Daking & Co.	38	302-658-7003
113	Grandma's Music & Sound	39	505-292-0341
79	Illbruck	41	800-662-0032
78	In-Vision	82	415-812-7380
81	Innovative Quality Software	43	702-435-9077
58	Institute of Audio Research	44	212-777-8550
148	JBL Professional	XX	818-895-8190
122	JRF Magnetic Sciences	91	201-579-5773
101	Klipsch	45	501-777-0693
27, 64	KRK	40, 81	714-841-1600
21	Leigh's Computer	46	215-658-2323
22, 31	Mackie Designs	42, 85	206-487-4333
52	Max Monitors	47	305-669-1330
67	Musician's Friend	65	503-772-5173
147	Neumann	92	203-434-5220
19	Peavey	48	601-483-5365
50	Phonic Hi-Tech	49	714-253-4000
52	Polyline	51	708-390-7744
45	Rane Corporation	55	206-355-6000
66	Rhythm City	56	404-320-7253
69	Rockford/Hafler	50	800-366-1619
65, 123	RSP Technologies	57, 95	810-853-3055
109	Sabine	52	904-371-3829
55	Samick	58	818-964-4700
87	Sascom Marketing	54	905-420-3946
37, 93	Shure Bros.	86, 79	708-866-2527
53	Sonic Foundry	59	608-256-3133
14	Sony	XX	800-635-SONY
100	Soundscape	89	805-495-7375
107	SoundTech	60	708-913-5511
39	Soundtracs	61	516-932-3810
85	Stedman	62	616-629-5930
96	Stewart Electronics	66	800-316-7626
80	Summit Audio	83	408-395-2448
75	Sweetwater Sound	67	219-432-8176
95	Symetrix	63	800-288-8855
41	Tannoy America	64	519-745-1158
28	TASCAM/TEAC America	68	213-726-0303
56	Tech 21	76	212-315-1116
48	The John Hardy Company	69	708-864-8060
84	The Recording Workshop	70	614-663-2544
120	Trycho Tunes	71	909-696-3577
85	West L.A. Music	72	310-477-1945
113	Whisper Room	77	615-585-5827
99	World Media Group	73	317-353-1113
5	Yamaha Pro Audio	74	714-522-9011
42	Z Systems	75	904-371-0990
71	Zoom Corp.	53	415-728-0210

World Radio History

EQ CLASSIFIED

AUDIO SCHOOLS



BE A RECORDING ENGINEER

Learn Recording and Mixing, Signal Processing, MIDI, Digital Audio and more. Intern at a top NY studio and benefit from lifetime job placement assistance. Ask about the special summer program for college students and the new VIDEO TECHNOLOGY PROGRAM.

800-544-2501

NY, NJ, CONN 212-777-8550

Lic. by NYS Education Dept. / HS or GED Required
App. for Vet. Training / **Financial Aid if Eligible**

Institute of Audio Research

64 University Place, Greenwich Village, New York, NY 10003

CALL CHRISTINE CALI AT (212)213-3444 ext.155 TO PLACE AN AD

ri-'kord! (record)

Learn to do it Professionally

Recording Engineer Training

10-week Recording Engineer Programs
Extensive Hands-on Training with the Latest Techniques and Equipment
Job Training, Financial Aid and Housing
Full- or Part-time Schedules

12268-HS Ventura Boulevard
Studio City, CA 91604
(818) 763-7400

Call for a Free Full-Color Catalog

LOS ANGELES RECORDING WORKSHOP

BOOKS/PUBLICATIONS

Looking To Buy Or Sell Used Gear?

Check Out *The* Publication Some Major Recording Mags Dont Want You To Know About!

Why? Because ***Pro-Audio Marketplace*** beats the pants off their ad rates, quantity of gear advertised *(1000+ pieces per issue)*, & fast publishing time *(every 4 weeks)*.

Pro-Audio Marketplace is the only nationwide classifieds publication dedicated to recording/MIDI/pro- audio gear - sold by individuals, home/project & major studios, etc.

- ***$25 subscription*** includes 12 issues and 1 FREE ad per issue.

Call now for a FREE copy!

408/247-5250

Pro-Audio Marketplace

467 Saratoga Ave. #440-E • San Jose, CA 95129
24 hr. FAX 408/984-1030

CAREER HANDBOOK

Your Audio Career Starts Here

The Career & Education Handbook compares the world's best audio programs. Find your future in this comprehensive 285-page guide.

"This is the best single source I know of for information on courses in sound engineering, music recording, and music technology."
– Gene Pitt, Editor- Audio Magazine

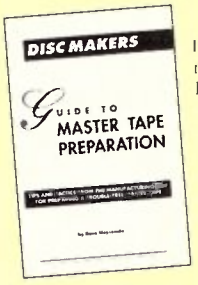
$25 US/CAN, $30 World. New Ears, 1033 Euclid Syracuse, NY 13210-2661 USA, ph: 315-425-0048

INFORMATION GUIDES

100,000 copies in print

FREE!

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

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 & is proven in studios worldwide. Request Foam-Buyers Guide Catalog, specs & free samples today. VISA, MC, AMEX, COD, PO's, QUANTITY DISCOUNTS.

MARKERTEK JUMBO SOUND ABSORB BLANKETS

Heavy-duty 72"x80" padded blankets absorb sound wherever they're hung or draped. Fabulous for stage, studio & field use. Top professional quality at a super saver price! Weight: 6 lbs. Black, **$19.99.**

MARKERTEK BLADE TILES™

HIGH PERFORMANCE **LOW, LOW COST!**

$3.49 per tile, 16x16x2". America's best acoustic tile value, only from Markertek! Charcoal. Also available 16x16x3" as shown, **$4.49** each.

MARKERSTIK™ foam adhesive. FREE with any Foam purchase in this ad! Limited offer. A **$5.95** per tube value.

SONEX

All the colors and sizes plus great prices!

Get our FREE 149-page catalog of over 6,000 exclusive and hard-to-find supplies for audio & video.

800-522-2025

FAX: 914-246-1757

America's most unique catalog for audio & video!

MARKERTEK VIDEO SUPPLY

4 High St., Saugerties New York 12477 U.S.A.

Tired Of Bad Sound?

Let Us Give You A Few Pointers.

Prices Start At Just $8.99 Per Sheet

We Have A Full Line Of Acoustical Products

Studiofoam™ Sound Absorbent Wedges

Our most absorbent. Uniform cut for cleanest installation (no innies & outies). Up to 60% more effective than other name-brand foams that can cost 5 times as much! Passes California firecode, is 48% more flame retardent than Sonex. Available in 1", 2", 4" & 12" (bass trap) sizes in sheets that measure 2'x4'. Long-lasting; doesn't crumble like other brands can. Wide range of colors available. Min. 1 Box 1"-$8.99 • 2"-$11.99 • 4"-$22.99

Sonomatt™ Convoluted Acoustic Foam

Cut in the industry-standard "eggcrate" shape. 4'x8' or 2'x4' sheets, 2" thick, charcoal gray. Super-affordable, yet outperforms other companies' premium brands that can cost up to 5X as much! 85% as effective as Studiofoam Wedges, but made of the same stock, so it's just as flame retardent & long-lasting. 4'x8' sold in pairs only @ $37.99 per sheet. 2'x4' minimum 1 box of 12 sheets @ $10.99 per sheet.

USERS: Ford Motor Co. • Warner Bros. • Opryland USA • Kodak • Dennis DeYoung (Styx) • Bell Research Labs • MTX • Editel • Hitachi • Rockwell Int'l • Baldwin Pianos • Martin Marietta • Pat Woodland (Late Show With D. Letterman, Disney) • US Gov't • G. Welsh (TBN, WalMart) • NJJ (NFL on Fox, Coke) • MPI (ABC News)

USAFoam • Box 20384 • Indianapolis IN 46220

1-800-95-WEDGE

World Radio History

DEALERS

BE A PART OF THE LEGEND AT MANNY'S MUSIC

From Jimi Hendrix to Guns N' Roses, Manny's has been the first choice of legendary musicians for almost 60 years.

Experience the tradition of Manny's legendary service, expertise and extensive equipment selection.

Call 212/869-5172 or write for your FREE product catalog today and become part of THE LEGEND.

(Add $2.00 shipping and handling outside Continental U.S.)

Manny's Mailbox Music

48th Street At Your Doorstep
156 W. 48th Street
NY, NY 10036

Hours 10:00 a.m. - 6:00 p.m. EST M-F

USED GEAR BY MAIL

THE CHEAPEST WAY TO OUTFIT YOUR ENTIRE BAND!

THE WORLD'S LARGEST USED EQUIPMENT DEALER

$5-6 Million of Used & New Guitars, Amps, Drums, Keyboards, Pro Audio Equipment, Effects and MORE!

MONEY BACK GUARANTEE!

Daddy's Junky Music

...when you're ready to rock!

Call or write today for your FREE catalog

Daddy's Junky Music
Used Gear By Mail
P.O. Box 1018 • EQ
Salem • NH 03079

CALL • 603-894-6492
FAX • 603-893-7023

ATTENTION MUSIC DEALERS

SELL EQ MAGAZINE

THE MONEY-MAKING READ FOR YOUR RECORDING & SOUND CUSTOMERS

(312) 427-6652

CARL FISCHER

312 SOUTH WABASH AVENUE
CHICAGO, ILLINOIS 60604

EQUIPMENT DEALERS

Don't Get Beat

When you need equipment call

8TH STREET MUSIC

(800) 878-8882

Philadelphia's Largest Musical Instrument Dealer!!!

8th Street Music, 1023 Arch St. Philadelphia, PA 19107

Sound Deals Audio

Home & Pro Recording Gear
Synths, Samplers, & Software
All Major Brands - Best Price & Service
250 Old Towne Road, B'ham, AL 35216
205-823-4888 Voice 979-1811 Fax

800-822-6434

MUSICIANS CONTACT SERVICE

established 25 years. Excellent Reputation. Musicians call a 24-hour hotline to hear job listings of copy & original bands.

IT'S CHEAP, IT WORKS.

Call (213) 851-2333.
7315 Sunset, Hollywood, CA 90046

CARUSO MUSIC

SAVE THOUSANDS OF DOLLARS BUYING YOUR NEW & USED EQUIPMENT FROM US

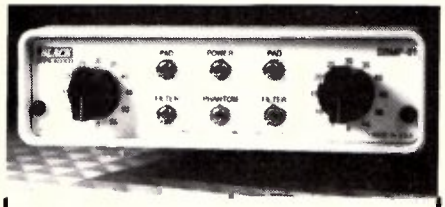
20 BANK STREET • NEW LONDON, CT 06320
203.442.9600 • 203.442.0463 (FAX)

To Place An Ad in EQ, Call Christine Cali at (212) 213-3444 ext.155

World Radio History

EQ CLASSIFIED

NEW PRODUCT



STEREO BATTERY MIC PREAMP

- Very low noise
- Very low distortion
- Warm FET sound
- Smooth low frequency response
- 20 dB pad on each channel
- LF filter on each channel - changeable frequency
- Uses easy-to-find 9 volt batteries
- Robust audiophile quality components
- Compact belt pack enclosure
- Much more! Call or write

Only $699.00

BLACK AUDIO DEVICES 805-653-5557
Box 106 · Ventura, CA · 93002-0106

COVERS/CASES & RACKS

OMNIRAX
STUDIO FURNITURE for the discriminating musician

800-332-3393
P.O.BOX 1792 SAUSALITO, CA 94966

COST-SAVING PROTECTION!!!

CUSTOM COVERS
FOR PRO GEAR
Stage, Studio, Home

ALL MAKES, & MODELS

Amplifiers
Speakers
Mixers
Keyboards
Vintage Amps
Recorders

CALL: 1 800 344-TUKI for info

FREE CATALOG!

PHONE. 803 821-1664
FAX: 803 821-9110

TUKI Covers, Dept. EQ, PO Box 2545, Summerville, SC 29484-2545

STORAGE SYSTEMS

America's best disc, tape and component storage system holds all recording formats

Free mailorder brochure
(please mention EQ magazine)

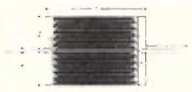
Per Madsen Design (415) 822-4883
P.O. Box 882464
San Francisco, CA 94188

LOUDSPEAKERS

SOLEN SPEAKER COMPONENTS

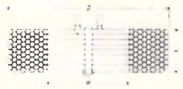
DAVIS Acoustics · DYNAUDIO · LPG · LA PASSION DU HAUT-PARLEUR AUDAX · vifa · FOCAL · scan-speak · seas · CERATEC · morel · Peerless · AIRBORNE

CROSSOVER COMPONENTS

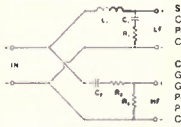


FAST CAPACITORS
Metallized Polypropylene (Non-Polarized)
Values from 1.0 mfd to 220 mfd
Voltage Rating: 250 VDC - 150 VAC

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

DIGITAL LAB STUDIOS ALESIS & MACKIE UPGRADES

Upgrade your Alesis ADAT to support the following:

1. DC to 100MHz input and output bandwidth
2. Up to 450Vus Slew rate
3. Balanced in on 1/4" Jacks
4. Improved balanced in on ELCO
5. Plug mikes or Line level right in to ALESIS at any level
6. Adjustable input gain level for each channel of Mike/Line Inputs of 1/4" or ELCO
7. Panthom power available for mikes
8. All chips socked for future upgrades
9. Plug in card takes 10 minutes to upgrade
10. You keep your existing cards for warranty support.
11. Plug your Neuman, AKG or Telefunken right into the ALESIS so you can avoid all that console electronics with adjustable gain levels. Take it on the road!

Upgrade your Mackie

Replace your noisy and slow Mackie Mike preamps with our high end mike preamp drop in cards. In 10 minutes you can get quiet mike preamps that smoke consoles costing 6 figures with improved input frequency response to 100MHz on the inputs.

All upgrades tested here under real conditions in our studio. The most impressive and inexpensive upgrade you will ever do.

DIGITAL LAB STUDIOS

Call or FAX today - **Digital Lab Studios**
7636 County Road 621 • Cape Girardeau, MO 63701
314-335-0141 • FAX 314-335-0510

TO PLACE AN AD IN EQ,
CALL *CHRISTINE CALI* AT (212)213-3444 EXT.155

World Radio History

EQ CLASSIFIED

DIGITAL EDITING SERVICES

Transfer Your Music to Compact Disk.
Playlist Editing-Voice Overs-Sound Effects.
TOP SECRET STUDIOS
Custom Dance Mixes For D.J.'s
Very Reasonable!-Call (718) 743-6432

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

See Our Ad on Page 127

VOCAL PROCESSING SERVICE

Let us make your Voice Tracks sound
Well-Controlled without sounding Processed.

Our proprietary Digital Signal Processing algorithms can enhance your voice tracks through frequency smoothing and contouring. In the same way that an artist uses a straight edge and a French curve, this process shapes the vocal track. It allows the pitch of each note to "lock-in" on perfect tuning and yet preserves desirable pitch bending and vibrato. This process does not measurably change the timbre of the voice. It creates a very pleasing effect of vocal controllability. Prices are very reasonable and turn around is quick. For full information and a free demonstration of this process on your voice track, contact:

VALLEY OF VISION PRODUCTIONS
PO Box 80999 Rancho Santa Margarita, CA 92688-9998
Telephone: 714-859-5110

JINGLE PRODUCTION

Would you like to learn how to make a fortune in the Jingle Business?

Call 1-800-459-9177 for a FREE RECORDED MESSAGE 24 HOURS and learn how. I'm a 17 year veteran with jingles in every state. My complete jingle course shows you exactly how to do the same. Part-or-full time, locally-or-nationally. CALL NOW This information will save you years of trial and error. Make the money you want with your music today.

EQUIPMENT FOR SALE

ODYSSEY PRO SOUND
SUPPLYING NEW and USED QUALITY RECORDING EQUIPMENT
Competitive Prices *Satisfaction guaranteed*
Consoles* Tape Machines*** Outboard Microphones***Vintage***and MORE!**
We buy, list, and trade quality audio equipment
CALL FOR CURRENT LISTING
Tel: (508) 744-2001 Fax: (508) 744-7224
MC/VISA Accepted

I Need a New Board!
so buy one of my Tee Shirts.
For $12.95 (& $2.00 S.&H.) you get a nice shirt & maybe I can get a GL-4.
509-878-1862

FOR SALE
Studer Dyaxis 1 Digital hard disk 2 channel editing system with DAT backup, synchronizer lock-up, 2 hours of audio storage complete with Mac Computer.
MCI-JH 24/16 Track Recorder
MAKE OFFER 510-540-0177

TECHNOLAB
DIGICON II/DESTROYER
- Eliminates the copy-bit (scms)
- Self synchronization from 32 to 48KHz
- Conversion from coaxial to optical signal and V.V.
- Battery powered for portability
- 2 year warranty

The DESTROYER is installable inside any DAT
Techno Lab USA
14634 Walnut Grove Dr.
Omaha, NE 68137-1422
Phone 402-895-7382 Fax 402-894-2147

ODYSSEY PRO SOUND
Supplying new, used and vintage quality recording equipment
Consoles * Tape machines *** Outboard *** Microphones *** Vintage**
- D&R Orion 51 frame, 32 dual in-line, 8 dual stereo, 96 inputs on mix....Mint Call
- Fairchild 662 pre-amps, 8 pre's racked w/PSU, 2 sets available ..... each $ 1.800
- Urei 809A studio monitors, excellent condition .....$ 750

We buy, list, and trade quality audio equipment
Please call/fax for availability MC/Visa accepted
Tel 508-744-2001 Fax 508-744-7224

LEARN TO PLAY CHORDS LIKE A "PRO" IN THREE WEEKS!

Steve Milo's

NAMM MEMBER

THE KEYBOARD MUSIC BOOK OF THE '90s

EASY LADDER OF CHORD PROGRESSION AND DICTIONARY OF CHORDS BOOK FOR ALL KEYBOARDS

Put the fun back in learning the basics! My music book, EASY LADDER OF CHORD PROGRESSION AND DICTIONARY OF CHORDS BOOK FOR ALL KEYBOARDS, is a quick and easy method for people of all ages.

Instead of memorizing chords, this book teaches the simplified "ladder" method of playing chords. This method carries the student through the seven basic chords and all 12 keys, providing theory for each key.

In my book you'll also find:
- **Quick Reference Table of Contents**

(set up note by note)
- **Charts for Fingering Position**
- **Glossary**
- **Scale Notes Space on each Page**

(workbook space)
- **Scale Note Reference Page**
- **Reference Keyboard Illustration**

This 32-page, large-print, colorful music book is a must for all keyboard players. For beginners of all ages, it promises fun while learning and makes an excellent reference for experienced players.

Retail Price:
- Steve Milo's Ladder of Chords Book for All Keyboards-$10.00
- Cassettes Volume I, II&III-$10.00
- CD's Volume I, II & III-$13.00

(Call for Brochure for Cassette and CD info)
$3.00 shipping and handling per item (book, CD or cassette)
Dealer inquiries invited

VISA MasterCard

STEVE MILO
P.O. Box 2387
Naples, FL. 33939
Winter Voice/FAX 813-261-0051
Summer Voice/FAX 508-790-4795
Toll Free 1-800-261-0051

World Radio History

DUPLICATION SERVICES

ESP
EASTERN STANDARD PRODUCTIONS, INC.
37 JOHN GLENN DR. BUFFALO, NY 14228
(716) 691-7531 • FAX (716) 691-7732
COMPACT DISCS
CASSETTES
NEW CASSETTE & CD COMBO PACKAGES!
CALL TOLL-FREE
1-800-527-9225
FOR A FREE BROCHURE

500 CD's-$1734* 500 Bulk-$983
1000 CD's-$2450 *
*Includes: Sonic System mastering, 2-color CD label, 2-page 4-color front, black back, 4-color inlay, design, composite film, matchprint proofs, bluelines, printing, replication, shrinkwrap to jewel case
Good Vibrations
RJR DIGITAL
San Diego 619-267-0307
800-828-6537 • FAX 619-267-1339

COMPACT DISCS
CASSETTE DUPLICATION
VIDEO DUPLICATION
CD's • State of the Art Real Time and High Speed Cassette Duplication • VHS Hi-Fi Duplication
Complete Graphic Design Services • Printing/Packaging • Blank Tapes & Accessories • Free Color Catalog!
500 Chrome Cassettes & 1000 Full-color inserts: $795 Complete!
1000 CD Package: $1599!!
EASTCOAST PRO
A Decade Of Serving America And The World...
Audio/Video Corporation • 40 Gardenville Pkwy. W. • Buffalo, NY 14224
(800) 365-TAPE (8273) • Phone: (716) 656-1296 • Fax: (716) 656-1589

COMPACT DISCS/CASSETTES
500 CASSETTES FULL COLOR $755.00
COMPLETE PACKAGES NO HIDDEN COSTS!
500 CD's FULL COLOR $1787
REAL-TIME CASSETTES • HIGH-SPEED CASSETTES
MACINTOSH BASED DIGITAL EDITING AND MASTERING
Free Brochure Whitewater Recording Since 1986
9 Busbee View Road Asheville, NC 28803
VISA 704-274-0956 MASTERCARD

DAT to CD Mastering for only $79.50 *
CD LABS will put your music on CD Masters for the lowest price in the industry!
Instead of a1630 tape, we transfer your Dat to a Master CDR. Plays on any CD player & saves you hundreds of dollars.
Here's why we're the choice of studio professionals for mastering to CD, editing & quantity CD replication:
Same or next day service on Master CD
Lowest Mastering Prices in the Industry
EQ & Level Correction Service
Every Disc Unconditionally Guaranteed
Digital Editing and NoNoise tm Service
SPECIAL DELUXE CD PACKAGES
1000 CD's w/4 page 4 color inserts.....ONLY $1975
500 CD's w/4 page 4 color inserts.....ONLY $1495
SPECIAL DELUXE CD/CASS. PACKAGES
500 ea.w/4 page 4 color inserts.....ONLY $2195
1000 ea w/4 page 4 color inserts.....ONLY $2895
Also available 500 or 1000 CD's $995 & $1150 respectively
THE ABOVE PRICES INCLUDE DAT TO CD MASTERING w/PQ LOG SHEETS, CD & CASSETTE LABEL IMPRINTING, JEWEL BOXES & 2 FREE MASTER CD'S
*2 Disc Minimum
CD LABS ™
Direct to CD Mastering
12517 CHANDLER BLVD., STE. 107
NO. HOLLYWOOD, CA. 91607
(818) 505-9581--(800) 4 CD LABS

MAXELL XL II CHROME HIGH BIAS BULK

QTY	C-10	C-20	C-30	C-40	C-50	C-60	C-70	C-80	C-90
100	.37	.42	.48	.55	.62	.68	.80	.87	.96

BASF CHROME SUPER HIGH BIAS BULK "CD QUALITY"

QTY	C-10	C-20	C-30	C-40	C-50	C-60	C-70	C-80	C-90
100	.42	.50	.59	.67	.73	.78	.90	.96	1.03

A MINIMUM OF 100 CASSETTES PER ORDER
LENGTHS MAY BE COMBINED TO MEET MINIMUM
ALSO AVAILABLE NORELCO AND SOFT POLY BOXES
CASSETTE LABELS AND J CARDS IN WHITE & COLORS
SHAPE MARK 10 SHELL AVAILABLE, ADD .10 EACH
WE CARRY A FULL PRODUCT LINE OF:
3M
AMPEX
BASF
MAXELL
PLASTIC REELS AND BOXES, ETC.
AUDIO, VIDEO & DIGITAL TAPES
IN NYC 718-435-7322
24 HOUR FAX 718-853-2589
1-800-221-6578
4212 14th AVENUE • BROOKLYN, NY 11219
ANDOL
VISA MASTER CARD AMEX DISCOVER

THE NAMES YOU KNOW AND TRUST...
HIGH BIAS BULK BLANK AUDIO CASSETTES

LENGTH	maxell XL II	BASF CHROME SUPER WITH ELAFE 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

Make your CDs look as good as they
MicroPatent's NEATO™ CD LABELER
* PATENT PENDING
Design, Print & Apply your own CD Labels*
Includes:
- Label design templates for: QuarkXpress, FileMaker Pro, CorelDRAW, PageMaker, Word for Windows.
- Patented* labeler device
- Complete instruction guide
- 100 FREE Labels

only $ 79.95
*Print Labels with your Apple - or HP - compatible laser printer
To Order Call 800.648.6787
MC/VISA/AMEX FAX 203.466.5054
MicroPatent 250 Dodge Avenue East Haven, CT 06512

Audiomation
Compact Disc Cassette Manufacturing
Call us before you order your CDs and Tapes, we will save you money.
1-800-375-2060

CUSTOM COMPACT DISCS
Affordable single copy CDs starting at $35.
Write, call or fax for information.
46 PRODUCTIONS
42W557 Hawk Circle
St Charles, IL 60175
TEL (800) 850-5423 FAX (800) 203-1725

Φ Flux Audio/Video
Custom Made CD-R -starting at $45
Up to 74 minutes / Includes Postage
Features FREE Color Tray Card and Insert / Any Source format
1-800-423-FLUX

IT PAYS TO ADVERTISE IN EQ

World Radio History

DUPLICATION SERVICES

REAL-TIME DUPLICATION
Brand new Sony decks, HX Pro, inserts, on-shell printing, shrinkwrap. Great service and the best prices around.
CUSTOM LENGTH CASSETTES
The finest materials available, loaded to the length you need. Special pricing to duplicators.
SoundSpace Inc. (513) 767-7353

VINYL • CASSETTE & CD PRODUCTION • DESIGN/SEPS/PRINT
Quality! 1•800•869•6561
CALL FOR FREE CATALOGUE / CUSTOM QUOTE
INDIE EXPERTS • PACKAGE DEALS • QUICK TURN • DROP SHIPPING
ALIGNED AUDIO INCORPORATED

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

PIERCE RECORDING
1-800-200-2629
- Real time cassette duplication on synced Nakamichi MR2 decks.
- Guaranteed lowest price in Unites States for real time duplication.
- Guaranteed quality or your money back.

SPECIAL SUPER SAVER
- 100 cassettes *(real time)*
- J-Cards
- on shell printing
- box and wrap

$269.00 up to a C-40

Shipping address:
Pierce Recording
5836 N. 11th St.
Arlington, VA.
22205

Single CD's $35.00
10 CD's $300.00
PreMastering $45.00/hr.
MEDIA PRODUCTIONS
(304) 465-1298

CD SINGLES
$35 Each - 1 day turnaround w/bw inserts
2 songs or 10 minutes maximum
also available:
Up to 63 minutes for $50 or $45 each when you buy two copies
Big Dreams Studio 708 945 6160

a+r
902 N. Industrial Blvd.
Dallas, TX 75207
214-741-2027
1-800-527-3472
VISA/MC ACCEPTED
CD's Starting at
$900.00
No Hidden Costs!
Compact Discs – Cassettes – Records
Great Package – Great Price
2150.00
1000 Compact Discs
All Setup Fees
All Typeset & Composite Film
2-Color Label - Printed 4-Color 2-Page Booklet with Black & White Back & Tray Card - Jewel Box with Shrink Wrap

DIGITAL FORCE™
MASTERING
REPLICATION
PRINTING
TOTAL PACKAGING
GRAPHIC DESIGN STUDIO
POSTERS
PERSONALIZED EXPERT SERVICE
COMPLETE CD AND CASSETTE PRODUCTION
The Power of Excellence℠
212 - 333 - 5953
330 WEST 58TH ST. NEW YORK, N.Y. 10019

Factory Direct.. Best Value!
EUROPADISK, LTD.
All Manufacturing In Our Plant!
SPECIALS "With This Ad Only"

500 - Promo CD's - $995
Delivery in 15 Business Days!
Promotional Package includes: CD-R Reference, One Color CD Label with Layout, Typesetting & Film (to 63 Min.)

500 - Cassettes - $715
(1,000 Cassettes - $1,025)
Retail Ready: *FULL COLOR* J-Card, Test Cassette, Graphics & Layout, Typesetting & Film, Cassette Label, Norelco Box & Shrink-Wrap (to 50 Min.)

500 - Color CD's - $1,995
(1,000 CD's $2,265)
Retail-Ready: *FULL COLOR* Front & Tray Card, 2-Color CD Label with Layout, Typesetting & Layout, Jewel Case & Shrink-Wrap (to 63 Min.)

500 - 12" Vinyl - $1,105
(1,000 12" Singles - $1,510)
Complete Package: Direct Metal Mastering, 5 Test Pressings, Label Layout & Printing, Plastic Sleeve, Black or White Die-Cut Jacket, Shrink-Wrap (to 14 Min. per side)

Best Values In The Industry!
Call For Our Complete Catalog
EUROPADISK, LTD.
75 Varick Street, New York, NY 10013
☎ (212) 226-4401 FAX (212) 966-0456

SINGERS SUPPLIES

IT PAYS TO ADVERTISE IN EQ

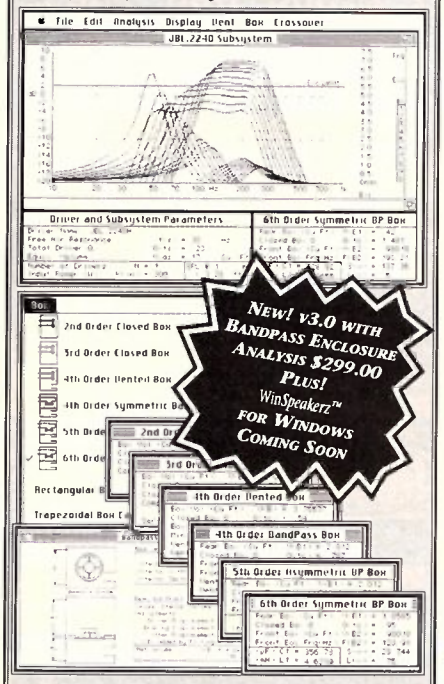
World Radio History

EQ CLASSIFIED

LOUDSPEAKER SOFTWARE

The Speaker Design Toolbox®

Friendly Loudspeaker Design Software for the Macintosh®



Call for a Demo Disk today!

MacSpeakerz from True Image Audio

349 West Felicita Ave., Ste. 122, Escondido, CA 92025

Phone 1-800-621-4411, Fax (619)-480-8961

Outside the U.S. Phone/Fax 619-480-8961

MIDI SEQUENCES

Midi Sequences for Today's Music!

The Dance Beats Library

Techno·House·Industrial·Rap·Funk·Pop·HipHop
Rock·Acid·Alternative·Rave·Post Modern·Retro

For Dos, Windows, Mac, Atari & workstation formats!

Drum Patterns: 650 Midi sequenced drum patterns. Intros, Beats, Break-Beats, Fills, Rolls, & Codas! Explode polyphony using all your favorite percussive sounds!
"Dance Beats" DB01, DB02.....$39.95 (ea)

Bass Templates: 60 Driving hardlines, each holding a powerful 4-bar bass line. "Hit making" material in the raw with Chorus, Verse & Hook forms!
"Groove Master" GM03, GM04.....$39.95 (ea)

Chords/Phrases: Upbeat, slashing chords and riveting melodious phrases make "Pop Piano" the ultimate accompanist! A *must* for contemporary Dance related tracks!
"Pop Piano" PP05, PP06.....$39.95 (ea)

GM SMF CH/MO CC/COD

Call (713) 852-0444 Now!
Big City Productions
P.O. Box 263 Humble, TX. 77347

NEW PRODUCT

RUSSIAN DRAGON

DRAGGIN' RUSHIN'

TIMING ACCURACY METER

Rack Mount RD-R $499 *Table Top RD-T $249*

Try a Russian Dragon risk free for 2 weeks.
If not completely satisfied, return it for a full refund.

800.880.8776 FAX: 210.344.3299

AUDIO UPGRADES

ADAT 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

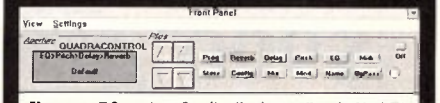
LA-2A LA-3A OWNERS

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

CUSTOM SOFTWARE

QuadraControl for Windows™



Use your PC to view & edit all of your QuadraVerb™ parameters, make real-time edits while your sequence plays back, and store patches to your hard drive. Call **Aperture Software** to order or for more information.

Aperture Software Ltd.
513-742-4073
VISA & MC Accepted

REPAIR SERVICE

MCI/ARMS/ARMS II AUTOMATION USERS

Expert Repair Services For
Your Automation System
Sound Workshop/Otari Approved
Quick Turnaround
Sales — Exchange

MUSIPLEX AUDIO
404-321-2701

EVEN SMALL ADS WORK!!

MAINTENANCE SERVICE

Pro Digital Inc.
Products and Service for the Digital Studio

DAT Machine Service
Over 2000 Machines Serviced!
Compare Our Rates!

Custom Cables
Harnesses/Snakes for ADAT and DA-88
AES/EBU and SPDIF/IEC-II Cables

DIGICON II Dubbing Solver
Cure Problems between Machines
Coaxial and Optical Ins and Outs

Hard Drives
HP and SyQuest Large Capacity Drives

(610) 328.6992

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

RIBBON MICROPHONES

COLES 4038 RIBBON MICS

THE BEST IN THE WORLD

SALES–SERVICE–PARTS

Call Wes Dooley
(818) 798-9128
FAX (818) 798-2378
1029 N. Allen Avenue
Pasadena, CA 91104

POP FILTERS

The Studio POP Filter

A Great Improvement on a Good Idea!

Open up the sound of your vocals and voice overs without annoying "POPS" ruining your best take!

Standard mic stand adaptor with threaded brass insert

Improved, new double screen One year guarantee

Only $24.00
with optional clamp and Goose-neck $44.95 plus shipping

ONE YEAR GUARANTEE

AUDIO VISUAL ASSISTANCE
565 SHERWOOD ROAD
SHOREVIEW, MN 55126
PHONE: 612-481-9715 (voice or fax)

World Radio History

DUPLICATION SERVICES

LENGTH	PRICE (ea.)
C-10	$0.30
C-20	$0.36
C-30	$0.42
C-45	$0.48
C-60	$0.58
C-90	$0.78

TDK PRO SA BULK

CUSTOM LOADED HIGH BIAS COBALT CASSETTES UNLABELED AND UNBOXED

$25 MINIMUM ORDER

NOW!
Recording System, Inc.
32 West 39th St, NEW YORK, NEW YORK 10018
TELEPHONE: 212-768-7800 u 800-859-3579

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

Eric Productions
15705 Arrow Hwy. Unit 1
Irwindale, CA 91706
Phone 818.856.8625
Fax 818.856.1736

CUSTOM MADE CD's
only **$59**
- 63 minute CDR
- **DISCOUNTS** for multiples
- **FREE** printed traycards
- DAT or cassette
- FAST turnaround

call: **615-367-9242**
write: **GREEN DOT AUDIO**
PO Box 290609
Nashville, TN 37229-0609

PRIVATE TUTOR

Radio Announcer
Recording Engineer
Photographer
Journalist
or...???

ON-THE-JOB TRAINING IN LOCAL
RADIO STATIONS, RECORDING STUDIOS, PHOTOGRAPHY STUDIOS, NEWSPAPERS & MAGAZINES. No experience required. Part time, Nights, Weekends. Free brochure and recording tells how.
1-800-755-7597 CAREER CONNECTION
EMPLOYER-TRAINED ALTERNATIVE EDUCATION

TOLL FREE 1-800-835-1362
Complete Full Color CD Packages:
500 CD's $1099.
1000 CD's $1649.
Complete Full Color Cassette Packages:
500 Cassettes $564.
1000 Cassettes $765.
CD Package includes:color 2 page folder, color traycard. 2 color on CD printing, pre master & glass master, jewel box, shrinkwrap, insertion of graphics. Does not include film or typesetting.
HEALEYdisc Manufacturing

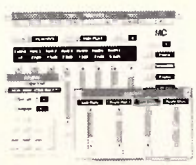
SAMPLES

SAMPLES ON DAT: 900+ KILLER SOUNDS FOR YOUR SAMPLER!
Drums, guitars, saxes, brass, synths, drum machines, sfx, MUCH MORE!
$29.95 (plus $2 s&h) payable to:
SAMPLE SOLUTIONS, Dept.Q
356 Ladybird Dr. Nashville, TN 37217

Put your music on
CD for as low as **$1.25**
SINGLES as low as $20
Any quantity from 1 to a zillion CDs or cassettes, at the lowest prices, and the friendliest service. Rare commodities in the music business.
The leader in small quantity CD recording.
708-945-6160
Big Dreams Studio

MIDI CONTROLLER

CONTROL YOUR LEXICONS!
ANNOUNCING SoftMC V2.0 FOR WINDOWS
SoftMC is an easy to use programmable midi controller for Windows. SoftMC will allow you to control multiple midi devices, at discrete levels, in a complex midi system environment. SoftMC controls virtually any midi device available along with extensive built in support for Lexicon's PCM70 & LXP series of effects processors. Perfect for live or studio use.



Only $99.95
TB Systems
2295 Boston Rd, Bld D-144
Wilbraham, MA 01095
For more info or to order call us at
1-800-476-3862
Visa & MasterCard accepted
Voice: (413)596-8380 FAX: (413)596-9846

CLASSIFIED ORDER FORM

To place an ad directly call Christine Cali at (212) 213-3444 ext.155, or fax (212) 213-3484

Please print or type in capital letters or lowercase. There are 7 lines to an inch, $90 per inch, one inch minimum.

Payment by check, money order or charge must accompany ad. Deadline for each issue varies, so call for next deadline date.

ALL ADS MUST BE PREPAID

Categories are: (pick one)

__ For Sale __ Sources & Services
__ For Rent __ Equip. Rental
__ Miscellaneous __ Bus. Opportunities
Or Create Your Own Headings

Name _____
Company _____
Address _____
_____
Phone _____

I am paying by:

□ VISA □ MC □ AMEX □ Check (enclosed)

Card # _____ Exp. date _____
Signature _____
Check Amount _____

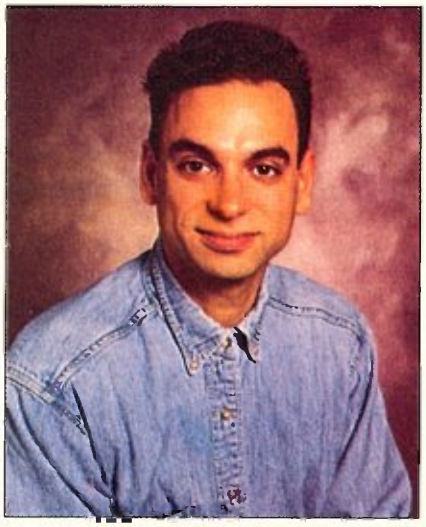
Mail to:
EQ Magazine/Classified Dept.
2 Park Avenue, Suite 1820
New York, NY 10016
Attn. Christine Cali

World Radio History

True Confessions

Now it can be told: How I made the hum go away

BY EDDIE CILETTI

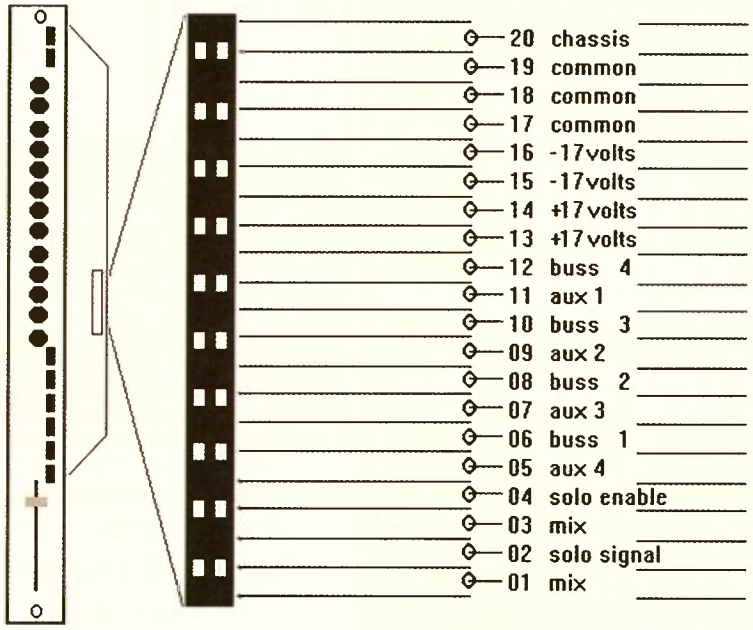


Anyone who has ever embarked on a studio construction project has encountered the phrase "Star Grounding," a process that starts with the establishment of a central ground point (a copper spike in the earth) and ends with each piece of gear being attached to it. The following modification incorporates this concept into the internal wiring scheme of a mixer, in this case, the Soundcraft 200B series.

By individually grounding each module, internal hum can be reduced up to 12 dB on a fully loaded 32-input frame. This feature has been incorporated into the new Soundcraft Delta series, as well as in consoles by Neve and Studiomaster. It can also be adapted to other mixers, but is most easily visualized and implemented on the 200 series.

GETTING DOWN TO BIZ

Whether you are attempting this project solo or with the aid of an experienced technician, be sure to locate the operator's manual and schematics.



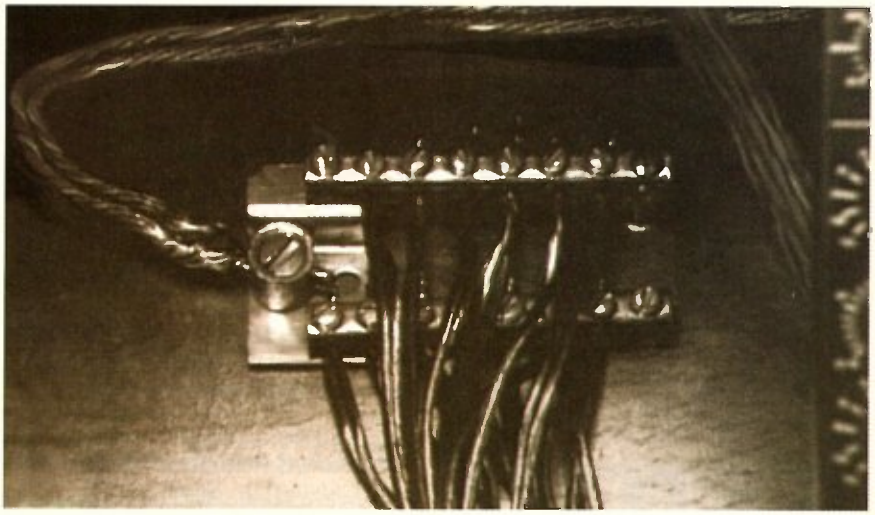


FIGURE 1 (top) and FIGURE 2

The block diagrams provide an overview of the signal path while the schematic diagrams detail the circuitry and wiring. (Clip this article and place it in the manual for future reference.)

Table 1 shows what tools and materials are required to get started. Before dismembering the console, number each module with a china marker. Then, grab a notebook (virtual or otherwise), and detail any problems such as intermittent connections, scratchy pots, faders, and so on. Use a Pozidrive Phillips screwdriver to extract the module screws without damaging them. (Using the wrong tool, or a damaged one, can make the simplest job difficult.) Place all hardware in a spill-resistant container.

Carefully disconnect each module one at a time. At the top of the channel modules are the mic, line, and insert connections. The lower ribbon cable provides power, ground, solo, and bussing functions to all of the modules. The goal is to provide a separate

World Radio History

A Scenic Tour Of The Seaside City That Plays Well For The Music Industry.

Start down by the docks of the city and wind your way along cobblestone streets that are bustling with urban energy. Streets packed with shops, restaurants, clubs and emporiums of traditional and non-traditional tastes. Get a feeling for the thriving arts community and a music scene that is bursting with creative energy. Find the commercial center and see how business really should be done.

Check in with the **City of Portland** and discover a group of people who will make it easy for you to make the move to a city whose destiny has music industry written all over it. And there's no telling where we'll be going from here. After all, we do have Bob Ludwig's world-class Gateway Mastering Studios.

Walk over to your phone

right now and call us for more information on the city that plays well for the music industry.

1-800-874-8144

PORTLAND, MAINE

The City That Plays Well For The Music Industry

City of Portland • 389 Congress Street • Portland, Maine 04101 • Tel: 1-800-874-8144 • Fax: 207-874-8649

CIRCLE 20 ON FREE INFO CARD

World Radio History

ground to each module. Since the beauty of this console is its modularity, the trick is to integrate the mod without sacrificing serviceability. Part of what we will be doing is cutting and peeling a ribbon cable, which, in practice, is actually a fairly easy thing to do. Luckily, the last four wires of the ribbon harness are ground.

Important: Pay especially close attention to the wiring of the group, aux, mix and monitor modules. You may even want to label each ribbon wire and its associated connector before disconnecting anything. Use a Sanford Sharpie® felt-tipped marker so the label won't rub off.

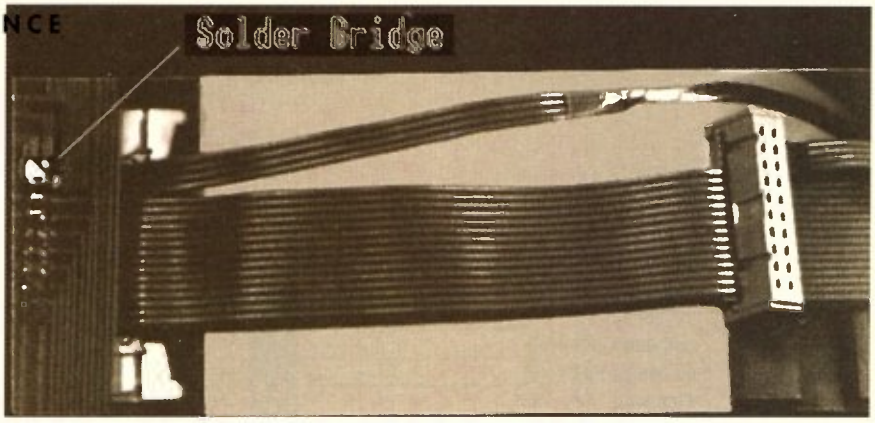


FIGURE 3

UNDER THE HOOD

The power distribution harness is opposite the power connector located on the rear panel of the console. The green wires distribute ground to the factory bus bar and the lower ribbon PCB. From here, power is fed to all of the modules. An exploded view of the lower ribbon connector and cable is detailed in fig. 1. The pin numbers are not specified on any of the schematics. The color stripe at the edge of the ribbon cable, plus an arrow embossed on the male connector (toward the fader), indicate pin one.

Place the modules in reverse order, face down on the console frame, starting with channel one to the far right. Once all the modules are in place, reorient and connect only the lower ribbon cable. Indicate the cuts to be made with a black Sharpie, but don't do any stripping or soldering before disconnecting the cable (you don't want any metal bits to fall into the modules). There will be one cut for each module, each of the four group modules and the stereo mix module. The monitor module can be fed ground through the ribbon cable. Fig. 3 shows what the mod will look like right side up.

Cut the ground wires to a universal length, bend at a right angle, and use the upside down modules to hold the wires in place. Be sure to leave enough slack so that the modules can still be removed. Once the harness is completed, secure it with wire ties. Disconnect the ribbon cable, remove the modules, reconnect the lower ribbon to the power distribution printed circuit board (PCB), and place the ground harness into the console frame. Now it's time to make a mess!

HEAT YOUR IRONS

After all of the cuts to the ribbon cable have been made, carefully separate each wire about two inches and strip about 3/4 inches of insulation. The outside wire, number 20, is the "chassis" connection. Twist it together with 17, 18, and 19, then tin. Remember to slip on a piece of shrink tubing before soldering to the ground harness. (Note: 16-gauge speaker wire is recommended because it is easy to find. Use one conductor per module.) When prepping the other end of the ground harness, be sure to twist each pair (to conserve space in the bus bar) and tin.

On the Input Channel PCB, link pin 20 of the ribbon connector with the other three by forming a solder bridge. (Notice the shiny spot just to the left of the four ribbon wires in fig. 3.) While your iron is hot, be sure to inspect the solder joints at all connectors (including the back panel) and frequently used switches.

IT'S A WRAP

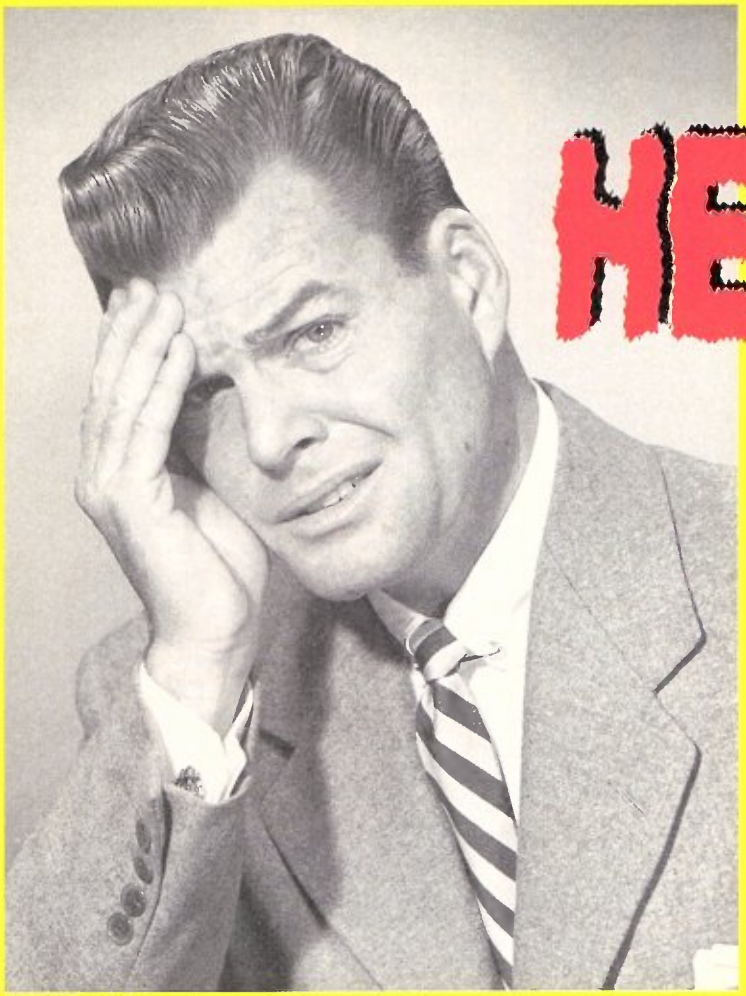
Be sure to carefully inspect your work, especially the modules, with adequate illumination. The modification is safe and easy so long as you cut the ribbon properly. Power up the frame once without the modules and measure the supply voltages at the power distribution PCB. Then reinstall the modules. Any hum that originated from the console should now be well below the hiss. Clients who received this treatment always commented that the low end seemed tighter and that the imaging improved. There is also a gain structure modification, but I'll save that one for a later column. EQ

TABLE 1: THE LIST OF PARTS AND TOOLS

#	Part	Part number	Description
1	16 gauge stranded wire	RS: 278-1267	Speaker wire works well
2	Shrink tubing	RS: 278-1627	Requires a heat gun
3	Heat gun	MCM: 21-1090	Can also be used to remove paint
4	Wire ties	RS: 278-1655	Radio Shack
5	40-watt, 700-degree (min.) soldering iron	MCM: 96-475	Weller/MCM
6	Flush cutters	64-1833/1808	Radio Shack
7	# 1 Pozidrive Phillips screw driver	MCM: 99-831	Xcelite/MCM (requires handle: 96-130)
8	60/40 solder	64-005	Radio Shack
9	Wire strippers	MCM: 22-555	MCM
10	Buss bar		Electrical supply house
11	Hand drill, bits, nuts and screws		Local hardware store
12	Sanford "Sharpie"		Local stationary store near you
13	Grease pencil/china marker		As above, formerly used for tape editing

Contact MCM ELECTRONICS at 800-543-4330

World Radio History



Don't get a studio HEADACHE just because you can't find the current issue of EQ

...realize that it's finally time to subscribe.

It's sold out at the newsstand. Somebody swiped the copy from your studio. You can't live without all those practical tips and techniques you get every month in EQ. What should you do?

Subscribe already. You'll save big money. You'll guarantee that you get your own copy. You'll save gas money. You'll become a smarter, better, more creative recordist.

You can't afford to miss the next issue of EQ.

Take two minutes to fill out the card and call us in the morning...

THE SUBSCRIPTION LADY HAS GOT YOUR CURE!

SAVE OVER 50% OFF NEWSSTAND PRICE!

☐ **YES,** I'd like to receive EQ ten times a year at a rate of...

☐ 1 yr = $24.95 (10 ish)
☐ 2 yrs = $39.95 (20 ish)
☐ 3 yrs = $59.95 (30 ish)

PAYMENT METHOD

☐ Bill me ☐ Check/Money Order ☐ Visa ☐ MC ☐ Amex

Card# _____ Expiration Date _____

Signature _____

Name _____

Address _____

City _____ State/Prov ____ Zip/PC _____

Prices good in US only. Canada add $10.00 per year for surface; other countries add $15.00 per year for surface; all add $30.00 per year for international air mail subscriptions. All non-US orders payable in US dollars by Visa, MC or Amex or international money order only. Allow 4-6 weeks for delivery of first issue. EQ 4/95

Mail to: EQ Subscriptions, PSN Publications, 2 Park Avenue, New York, NY 10016

World Radio History

ACROSS THE BOARD

continued from page 146

processing delays, and digitally transferred it back to the Sony 48-track. The improvement in the sound of the piano meant that we could keep the original piano track instead of having to replace it.

Since I mentioned Sound Tools, as long as the piano was on the hard disk, I thought I would correct some of the timing mistakes from the live performance. I loaded the kick drum and the Rhodes electric piano into two other channels of Sound Tools. I then proceeded to take each chord played on the acoustic piano and lined it up with the kick drum or Rhodes to tighten up the feel of the basic track. I didn't move everything. I left the majority of the playing alone, I just straightened out the spots where the Rhodes and piano were supposed to play rhythm parts together. Piano rhythm parts where Donald wasn't playing were lined up with the kick drum.

I didn't just arbitrarily line things up so they hit at exactly the same time. I first listened to each tune and found spots where the Rhodes and piano sounded good together and looked to see where they hit in relationship to each other. I then used these parameters to line up other spots. I would just move them to be within the outside limits calculated earlier. These relaxed parameters made sure that the track maintained the human feel from the live performance, but fixed any gross errors. I didn't move the piano on every tune, some of them were just fine, but I am not against using technology to improve things a little bit. Sort of like a musical "face lift."

MORE THAN 16-BIT

I have talked in the past about the Sony Super Bit Map method of making 16-bit audio sound more like 18 or 19 bits. I also talked about the UV-22 process used by Apogee to do the same thing. These boxes work very well, but are out of reach for most project studios. Not so fast, 20-bit breath. Sony has a new DAT machine that includes Super Bit Map processing. It is the DTC-2000ES. It has a list price of $2500 and is available now. It also has a built-in microphone preamp for those of you who want to record direct to DAT using a stereo microphone. Apogee has started shipping its new AD-1000 analog-to-digital converter that includes a subset of the UV-22 process. We can now make our 16-bit recordings sound a little *bit* better (pun intended) while we are waiting for 20-bit CDs.

CD-ROMS

I have continued to play with the Pinnacle Micro RCD-1000 SCSI-based CD recorder. I have been making CD-ROMs. I have archived all of the Wendel (sampled drum sounds) files and all of the other sampled sounds that I have accumulated over the past 15 years. I have also made myself CD-ROMs of groups of programs that I use for particular projects. For instance, I made a CD-ROM that I pop in when I am C programming. These editors and compilers don't need to take up hundreds of megabytes of space on my hard disk when I am not actually programming, so now I just pop in the CD whenever I need it. I also made a backup image of my hard disk so that when it crashes I don't have to go back to the original disks.

That should fill up a page and a half. Now back to replacing the audience tracks on the Steely Dan Live album. It is supposed to hit the stores in September. I hope we're done by then. EQ

EQ

COMING UP IN MAY 1995

TO BE A PART OF THIS ISSUE, CONTACT:
Kathleen A. Mackay;
Associate Publisher (ext. 152)
Matt Charles (ext. 147)
Daniel A. Hernandez (ext. 150)
Andrea Berrie (ext. 148)
Christine Cali (ext. 155)
Advertising Sales
TEL: 212-213-3444
FAX: 212-213-3484

CAPITOL GAINS. **Al Schmitt has been a leading force in the music recording industry for decades. Renowned for his Sinatra sessions and his mastery of Capitol's famed Studio A, Schmitt has influenced several generations of recording engineers and producers. Al takes a look back (and ahead) in this exclusive *EQ* career retrospective.**

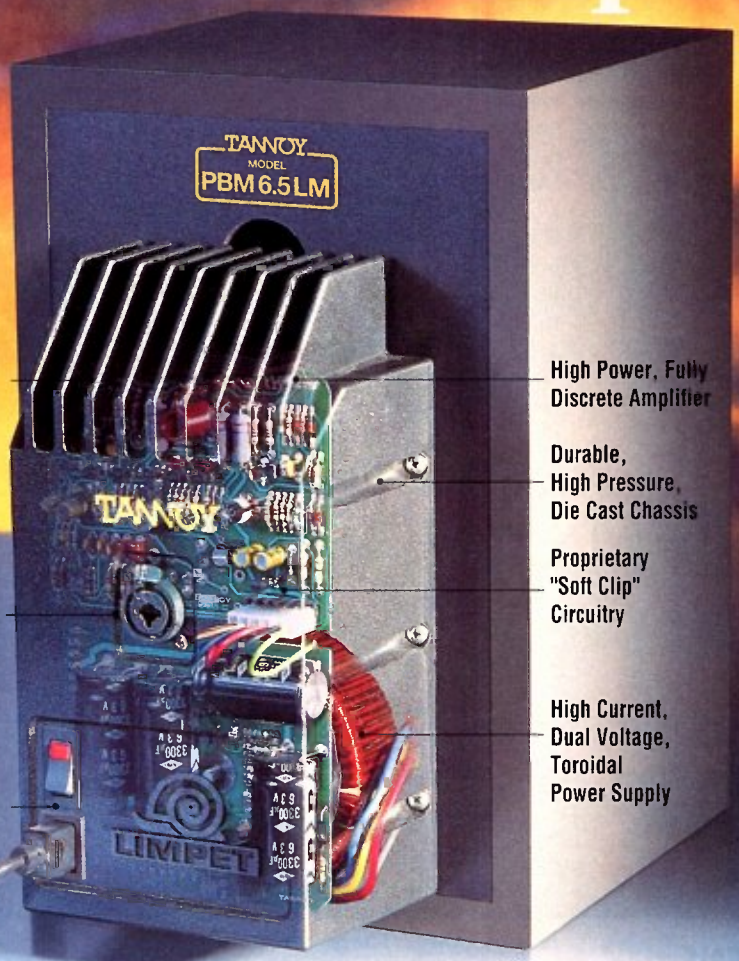
THAT'S DAT. **The new crop of DAT machines have added many improvements to the format. If you've dissed DAT, it's time for a second look and *EQ*'s new DAT roundup helps you do just that. This special section offers applications, techniques, and reviews of five of the hottest DATs on the market — Fostex D5, TASCAM DA-30 mkII, Panasonic SV-4100, Sony PCM-2700A, and HHB PDR-1000.**

CLEARED FOR ARCHIVAL. **Roger Nichols tells of the trials and tribulations of storing audio projects for posterity (or profit, whatever comes first).**

FUNNY BUSINESS. **Grammy-award winner Brooks Arthur, whose production of Adam Sandler's hot comedy album is soaring up the charts, discusses the finer point of recording comedy.**

World Radio History

They Call Him "Mr." Limpet®



Fully Integrated Heat Sink

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

Lighted AC Switch & Detachable IEC Connector

High Power, Fully Discrete Amplifier

Durable, High Pressure, Die Cast Chassis

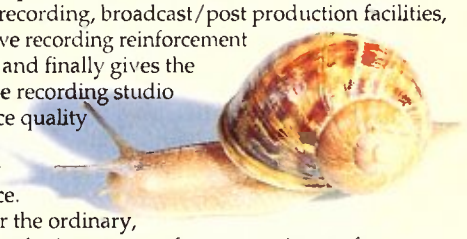
Proprietary "Soft Clip" Circuitry

High Current, Dual Voltage, Toroidal Power Supply

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

TANNOY

HEAR BELIEVE

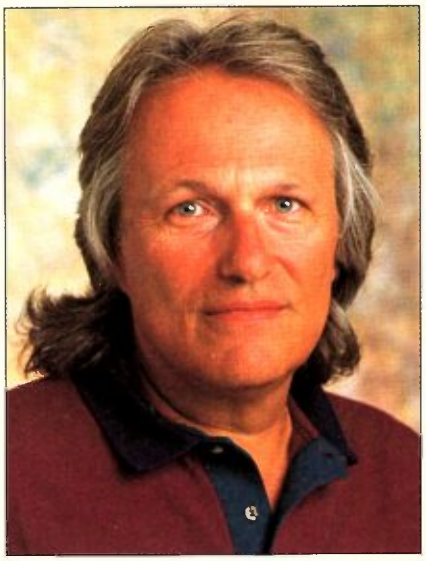


TANNOY/TGI NORTH AMERICA INC. • 300 GAGE AVE., UNIT 1, • KITCHENER, ONTARIO, CANADA • N2M 2C8 • (519) 745-1158 • FAX (519) 745-2364

CIRCLE 97 ON FREE INFO CARD

World Radio History

Digital Ramblings



What's going on and what's going to happen in the world of digital

BY ROGER NICHOLS

OK, what are we going to talk about this month? How about starting with the new digital satellites that use the pizza-sized satellite dishes? I have one of those big 8-foot dishes on top of my house with the positioner that moves it to all of the satellites. The big dish is necessary because the power being transmitted by the satellite is very low, typically about one watt, and since the satellite is 18,000 miles away, you need a big antenna to gather up enough signal to be useful. Each satellite, or "bird" as the satellite guys like refer to it, has 24 transponders. A few of the birds have all of the transponders beaming channels down to dish owners, but many of them are devoid of programming. That means that you have to do a lot of dish moving to surf around the programming possibilities. The other thing about the current dish technology is that it is analog. This means that weak signals come in snowy, and even the strong signals are susceptible to interference from air conditioner compressors and vacuum cleaner static.

Not so with the new Thomson (RCA) system. The bird is a "direct broadcast" satellite, which means that the transmitted signal is more powerful and you don't need a large receiving dish to get a good signal. The term "direct broadcast" was coined because the concept was to broadcast the information directly to the consumer, each house with its own dish, as opposed to a central satellite receiver like a cable company. In addition to the signal being stronger, it is also digital. This means that you either get a perfect picture or no picture, there is no middle ground. And to top it all off, there are 150 channels of information on one satellite. Each satellite receiver has a serial number and is addressable for subscription channels and pay-per-view programming.

So, what does this have to do with audio? Well, it puts us one step closer to a music delivery system that cuts out the record distributor and the record store. There are companies right now broadcasting digital audio over satellite, but you have to be a subscriber to the right cable company in order to get it. With these new, small, cheap dishes, you can get the programming anywhere, from a New York apartment to a farm in Iowa.

The way I see it, the scenario goes like this: First, you use your Internet connection to dial up a World Wide Web site where you cruise around to all of the record companies checking out new artists. You see something that looks interesting and you download a low-resolution audio file of some cuts from the album. You like what you hear, so you decide to order the album. Second, you will have a choice of whether to have the production version of the album sent to you by FedEx, or downloaded to your recorder by the digital satellite. I want this to happen, yesterday.

T.C. M5000 UPDATE

If you read my "Record Company In The Basement" article (and you really should), you heard me talk about the t.c. electronics M5000 that I used for its 3-band compressor program. The problem was that I also wanted to use parametric EQ and level control on a couple of the tunes. There was also one tune that needed a little more ambiance (reverb) added to make it better match the other tunes. This required two passes through the M5000 to get the desired results. The amount of limiting effected the amount of ambiance that should be added, and vice versa. I had to keep going back and forth until I got it just right.

I knew that you could add another DSP engine to the M5000, but I didn't realize that you could use the second DSP as an inserted process from the first DSP. I got a second DSP card and plugged it in the back of the M5000 and bingo, I could now run the compressor software on one DSP and the EQ or ambiance programs on the other DSP, thus allowing me to do the whole mastering session at once. If the compression sounded like I needed to change the EQ, then all I had to do was turn the knob and change the EQ. What a concept.

STEELY DAN STUFF

One more comment on the M5000. I am currently working on the "Steely Dan Live" album. I recorded the acoustic piano with a pair of microphones, but because of the leakage into those microphones from everything else in the universe (I could have sworn I even heard an old Sputnik beep), I also recorded the piano from the Helpenstill piano pickups. Using only the direct pickup, it sounded more like the hammers in the piano were pounding directly on your ear drums. It needed help. I ran the piano track through the M5000 digitally from the Sony 48-track. I used the digital parametric EQ for tonal balance and the compressor-expander section to control some of the dynamics, sent the signal digitally into Sound Tools, offset the piano earlier to make up for the

continued on page 144

World Radio History

Neumann's new KM 184 Microphone shown actual size

Robert Scovill knows microphones. Named by his peers "Best Sound Reinforcement Engineer" worldwide for two years running, he has mixed for acts like Rush and Def Leppard. His first choice in microphones is Neumann.

"During the pre-production stages of a tour, an incredible number of decisions are placed in my hands. Neumann has made some of these decisions very easy, indeed. There are a lot of look-alikes out there, but Neumann is the real thing."

Introducing the KM 184 - a small diaphragm condenser microphone designed for critical recording and live sound applications. With 20Hz to 20kHz frequency range and 138dB maximum SPL the KM 184 is particularly useful for percussion, cymbals and brass instruments. It is also excellent for capturing the subtle nuances of acoustic guitar and orchestral performances with its extremely quiet (16dB A-weighted) self-noise. Best of all, it has that *Neumann Sound*.

Now, with the KM 184, you have hand-built, legendary Neumann performance for less than $600.* Neumann... the choice of those who can hear the difference.

Neumann | USA

6 Vista Drive, PO Box 987, Old Lyme, CT 06371
Tel: 203.434.5220 • FAX: 203.434.3148
West Coast: Tel: 818.845.8815 • FAX: 818.845.7140

* MSRP. Subject to change without notice.

CIRCLE 92 ON FREE INFO CARD

World Radio History

SR SERIES II, THINK OF IT AS FREEDOM OF CHOICE.

There's a little something for everyone in SR Series II™. From small combo vocal reinforcement to large club systems, from mobile DJ and recorded music reproduction to stage monitoring, front fills and main PA stacks in concert applications. SR Series II has evolved to be the first choice of musicians and sound engineers world wide. Here's what this evolution has produced.

MORE MODELS

You have a greater number of configurations from which to choose. With more systems containing large format compression drivers plus a dual 18-inch subwoofer system, SR Series II is sure to have the loudspeaker systems to fit your needs.

OPTIMIZED APERTURE™ TECHNOLOGY

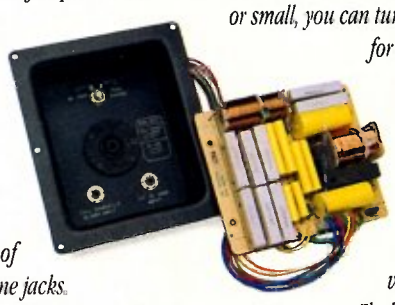
Our newest horn technology, available in five models, yields outstanding pattern control (90° X 50°) and exhibits the lowest midband distortion we have ever achieved in large format systems. Equally important, the 2447J compression driver extends high frequency response well above 18 kHz, virtually eliminating the need for a separate tweeter.

INNOVATIVE COMPONENT DESIGNS

Many of the models incorporate recent breakthroughs in component design. The 2119H has been engineered for extra output power capability in dedicated midrange applications. Our 2417H small format compression driver incorporates the lightest diaphragm we have ever made, resulting in exceptional transient response, enhanced high frequency clarity and crisp, clear vocals.

ROADWORTHY CONNECTORS & CROSSOVER NETWORKS

You now have the choice of Speak-On® connectors or phone jacks. Speak-On's permit the use of multi-conductor cable for quick and reliable set-ups. Or you can choose the simplicity and convenience of 1/4-inch phone jacks. The input terminal cup is made of heavy gauge steel to endure years of road use and abuse. A heavy-duty rotary switch makes selecting Passive or Bi-amp operational modes quick, easy and reliable. Crossover networks have been re-engineered to survive years of road work and offer outstanding acoustic performance. Highest quality close tolerance capacitors, high power resistors and low insertion-loss inductors assure the smoothest possible acoustic response. Regardless of your application, large or small, you can turn to SR Series II for the most reliable sound reinforcement solutions. For complete technical information via fax, call the FlashFax number below. Better yet, stop by your local JBL Professional dealer for a personal demonstration.



JBL

JBL Professional
8500 Balboa Boulevard, Northridge, CA 91329
(818) 893-8411 FlashFax™: (818) 895-8190, Reference 512

A Harman International Company

World Radio History