

EQ

THE PROJECT
RECORDING
& SOUND
MAGAZINE

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DECEMBER 1995

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ALESIS

CIRCLE 05 ON FREE INFO CARD

INSTEAD OF BRAGGING ABOUT OUR 8-BUS CONSOLE AGAIN, WE THOUGHT WE'D BRAG ABOUT EDDIE KRAMER BRAGGING ABOUT OUR 8-BUS.

Okay, bragging is too strong a word. But we are very proud when one of the most important, rule-breaking, producers in recording history has become a Mackie 8-Bus fan.

After all, Eddie Kramer's role in the making of popular music has changed its sound forever¹. His recipe? "Make a record unlike anything that's ever been heard." So, while other engineers in London were churning out England's formula Pop of the Day, Eddie Kramer was across the console from a strangely-dressed young man from Seattle named Jimi Hendrix. Together, they broke practically every

sonic and musical rule in sight. The result was an aural legacy of such originality that it still sounds amazing — even revolutionary — a quarter century later.

Eddie hasn't gotten any more conservative over the years. So it's not surprising that a man with Kramer's receptiveness to change would add a 32•8 to his creative arsenal. A mixing console that costs hundreds of thousands less than those he's worked on for most of his awe-inspiring career.



1. Including Hendrix, Led Zeppelin, Kiss, Buddy Guy, and more recently, his work with other Mackie mixer owners: Sting, David Abbruzzese, Vinnie Colaiuta, Stanley Clarke, Tony Williams, Steve Vai, and Carlos Santana.

2. He hates the location of the 8-Bus' talkback button.
3. According to Eddie, Eric Sherkman (Spin Doctors), Little Red Wagon Mobile Recording Studio, Bootsie Collins and John McEnroe have purchased 8-Bus consoles at his urging.

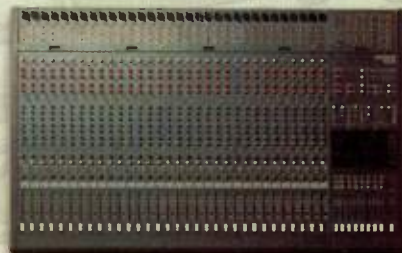


A console he says he likes for its "...sweet EQ, dynamic range, and cleanliness."

Eddie wanted to do more than just take advantage of the creative and lifestyle options afforded by the project studio revolution. He also wanted to help DRIVE it. So a year ago, we agreed to lend Eddie a 32•8 in return for his feedback. Since then, we've learned Eddie is not shy about expressing his opinions. Luckily they're mostly good².

And Eddie Kramer recommends Mackie consoles to his associates, too³. In these cynical times (when pop stars accept millions to "endorse" products they admit later to having never tried), we at Mackie Designs think that's the only kind of "endorsement" worth having.

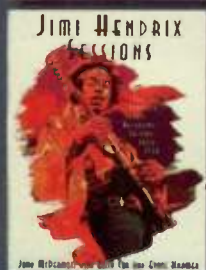
If you're in the market for a serious but affordable mixer, we hope you'll take a close look at the only 8-bus console Eddie Kramer says is worth having.



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Sample Eddie's latest work on "In From The Storm."

A brilliant orchestral homage to Hendrix with an astonishing array of some of the best players in the world. Leave it to Eddie to break more rules. (Not surfer should check out the RCA Victor Web Page @ <http://rcavictor.com>.) For a great read, pick up the Jimi Hendrix Sessions book by John McDermott with Billy Cox and Eddie Kramer (Little Brown), and on video, Adventures In Modern Recording available from Mix Bookshelf. 510-653-3307.

EQ



PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 6, ISSUE 12
DECEMBER 1995



ON THE COVER:
The legendary Joe Meek.
Photo by Chris Babley.
Retouching by the Artist.

FEATURES

- JOE MECK: A MADNESS TO HIS METHOD** *By Dennis Diken*54
Meet Joe Meek: One of the most colorful producer/engineers in the history of audio. Laboring feverishly in his London apartment-based studio, Meek churned out the hits as well as some fairly strange sounds that came to be his signature. Learn the secrets of the man who made his own gear, talked to Buddy Holly after he died, and turned a three-floor flat into a hit factory.
- HOLIDAY BUYER'S GUIDE: TECH THE HALLS** *By Steve La Cerra & Tony Savona*70
Wait! Put down the tie with G-clefs! *EQ* tells what your favorite audio professional *really* wants this holiday. And nearly everything on this list costs below \$200, so you can buy lots!

EQ LIVE

- HOLY WATER: THE POPE ON TOUR** *By David Scheirman*78
- FIRST LOOK: QSC POWERLIGHT 4.0 AMPLIFIER** *By Steve La Cerra*82
- FIRST LOOK: SOUNDCRAFT BROADWAY CONSOLE** *By Steve La Cerra*84
- NEW GEAR FOR YOUR NEXT GIG**88
- ROAD TEST: BEC TECHNOLOGIES MP16 MIC PREAMP-SPLITTER** *By Wade McGregor*90

TECHNIQUES / WORKSHOPS

- KURZWEIL THE TIME AWAY** *By Tony Di Lorenzo*48

COLUMNS / DEPARTMENTS

- MI INSIDER: AFTER THE CRASH** *By Craig Anderton*44
- MAINTENANCE: THE MYSTERY OF CABLES REVEALED** *By Eddie Ciletti*110
- FAST FORWARD: NO RECORDING ALLOWED** *By Martin Polon*114
- ACROSS THE BOARD: XMAS TIME AGAIN** *By Roger Nichols*130
- EDITORIAL**6
- LETTERS TO EQ**8
- EQ&A**12
- PRODUCT VIEWS**18
- STUDIOWARE**24
- FIRST LOOK: FOCUSRITE EQ PRO TOOLS PLUG-IN**28
- EQ TRACKS: THE RENTALS "FRIENDS OF P."**32
- ROOM WITH A VU: WEASEL-BOY RECORDING**38
- MICROPHILE: GOLD-PLATED NEUMANN U48**40
- IN REVIEW: YAMAHA RM800 CONSOLE**94
- IN REVIEW: BEHRINGER EDISON PROCESSOR**98
- IN REVIEW: FOCUSRITE RED 6 MIC PREAMP/EQ**102
- EQ AUDITION: AUDIX STUDIO 1A NEARFIELDS**106
- AD INDEX**99

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LETTER FROM THE EDITOR

Live & Kickin'

AROUND 2-1/2 YEARS AGO, while going through readers' snail mail and e-mail, we noticed that a good amount of correspondence was coming from soundmixers and players asking questions about, or thanking *EQ* for the coverage on, live sound. *EQ* had already been covering live sound, but the reader response told us that while we were on the right track, we needed a bigger train. Readers felt *EQ* was the only book honestly giving them what they needed on a steady basis — but they wanted more.

So we responded with an improved "Band-in-a-Van," section that included a new product section devoted to stage work. Now, of course, *EQ*'s live section has evolved into the industry leader, and is responsible for a good percentage of *EQ*'s recent outstanding growth.

Curiously, some folks are still asking: "Isn't *EQ* the Project Studio magazine?" Yes. D-e-f-i-n-i-t-i-v-e-l-y. However, the project studio field is broad. It encompasses a whole arena — from music recording to post-production to live recording to, my point here, sound reinforcement. Folks with smaller businesses don't have the luxury of turning down good business just 'cause it's outside the studio walls. We're all part of the "Project Arena."

Many who toil daily in project rooms often dedicate their nights and weekends to mixing live sound. It's part of the life. Groups whom you've recorded frequently ask if you'll also do their live dates. Others of us do live sound rentals, installations, and mixing day-in/day-out. If you do live sound on a local, or even regional basis, you've told us that *EQ* is you. Thanks.

Those who work at the grass-roots level don't often get the publicity. And so it is in recording and live sound. But the sound industry is supported by its grass-roots constituents (the industry just sometimes forgets). It's great to read (everyone loves to dream) about those mega-tours by the Stones, Springsteen, and Elton John, but the reality is that most of the gear that's purchased and used each year is used in niteclubs, waterfront jazz festivals, county and state fairs, schools, and houses of worship. Not the stuff on *Billboard*'s cover, but it's the heart and soul of the SR world.

A year or so ago — just to prove/disprove my theory — I made a very thorough but, I admit, informal survey of NSCA and NAMM convention exhibitors. The main question was: "How much of your gear is used on a local or regional level?" That is, is most of your equipment sold to national/international SR companies or local/regional outfits? Even I was surprised by the answer: the majority of companies clearly stated that between 70 to 80 percent of their gear is purchased by companies operating on a local level. Essentially, that means that 7-8 of every 10 power amps, for example, is sold to you. And I say "you," *EQ* reader, because no other publication consistently serves this significant segment of the project arena (check it out). Didn't know you were so powerful, did you? (Be benevolent; use your new-found power only to do good...)

In future issues of *EQ*, you'll find even more tips and techniques designed to help you do your job better — whether you work SR or studio, or both. Look for articles on how to choose the best live mix position, affordable studio construction tips, studio mixing, working with guitars, and more.

Keep writing. It keeps us from getting lonely.

Hector G. La Torre
Executive Director

Pro Mix 01 AND THE SUBTLE ART OF eq.



YAMAHA
20
B I T
TECHNOLOGY



ProMix 01 parametric eq gives you dozens of frequency centers in three overlapping bands, from a very low 32 Hz to a sparkling 18 kHz. Q is adjustable in 1/6th octave steps with low and high frequency shelf. A graphic LCD display shows the details of every move you make.

Call the 800 number below for your free ProMix 01 Video and Application Guide

Mixing is something like painting. Whether it's for a live audience or in the studio, equalization, or eq, is like the "palette and brushes" that let you adjust the shade and tint of each sound in your mix.

In the eq world, true parametric eq is the most precise of all. But it can be very expensive. It's normally available only as an integral part of a large console. Or as a separate add-on unit that can cost thousands.

So why would someone pay big bucks for parametric eq? With ProMix 01 you can afford to find out—because ProMix 01 is the only mixer in its class with true parametric eq on every input channel.

Fundamentals and harmonics: the hues and tints of music.

Each sound in your mix is made up of many "colors" or frequencies. If you look closely at a shiny object, you notice it's not simply gold or silver—it

displays a complex array of colors that let you know it's reflective.

When you listen to a sound by itself, you mostly hear

its predominant frequency—the fundamental. But like the

shiny object, if you listen closely you'll hear subtle frequencies called harmonics that give the sound its character.

Eq lets you control these subtleties. Making an acoustic guitar seem larger than life—more out-front—by simply boosting the high-frequency harmonics from the strings. So the guitar becomes more noticeable in your mix, without

actually raising its volume.

You can also use eq to solve problems in a mix. Such as removing feedback in a live concert; removing hum or noise from an electric instrument; or taking the "edge" off an instrument that's stealing attention from a lead vocal. With eq, you can make sounds stand out or blend in. In short, it's the accent that can turn a group of sounds into a great mix.

A different shade of blue?

Most equalizers give you a pre-determined choice of two or three frequency locations at which you can boost or cut. That can be really limiting—like having only two or three colors to paint with. You'll quickly discover this when you want to add presence to your vocal track, solve a feedback problem, or remove electronic "hum," and need frequencies that fixed-band equalizers don't provide. Parametric eq, as provided by ProMix 01, gives you a spectrum of frequency choices. Like having all the colors of a color wheel available to paint with.

What size brush?

In addition to frequency and gain controls, the true parametric eq on ProMix 01 includes a Quality Factor or "Q" control. Going back to our painting analogy, Q is like the width of your paintbrush. It lets you determine how wide or fine an effect you want the eq to have. Unlike the pseudo-parametric or "sweep" eq some mixers provide, true parametric eq lets you boost and cut subtleties in your mix with the precision of a Renaissance artist.

The ProMix "Paint Box."

Now that you know why parametric eq is so highly regarded, just imagine applying that artistic freedom to your next project. What could you do with more colors and more control over them? With 3-band parametric eq on every channel and the main stereo output, ProMix 01 gives you dozens of frequency centers to choose from. It's like enhancing your mix with a paintbox that includes every color in the rainbow.

A memory for the details.

ProMix 01 also saves you time by remembering all your eq settings in memory. So once you've found that magic eq curve, you can instantly call it up weeks later, along with all the other settings in your mix. ProMix 01 even includes a built-in eq library which holds 30 time-tested eq curves for you to use. You can call these up as starting points, modify them according to taste, and store your own custom settings in the library for use at any time. The large, backlit LCD display gives you visual as well as precise numeric representation of your eq on each channel—making eq'ing with ProMix 01 an illuminating experience indeed.

We could go on and on about ProMix 01's other advantages. But that's another ad. In the meantime, get the book and see the movie. **Just call 1-800-937-7171, ext. 550** for your free copy of the new ProMix 01 Application Guide and Video. Then take a spin at the dealer nearest you, and see how ProMix 01's parametric eq handles the curves.

ProMix 01 gives you three bands of true parametric eq. As well as a library of 30 time-tested eq curves, plus room for 20 more custom curves of your own.

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EQ LOW MID HIGH LIBRARY

YAMAHA
Smart Mixing

CIRCLE 70 ON FREE INFO CARD

World Radio History

UNSOLICITED TESTIMONY

I purchased a copy of EQ on CD through the magazine, and I just want you to know how much I love it! It's a great reference source for so many different topics. I think more people should know about this product — computers (and CD-ROM drives) become more and more popular every day, and there are probably a lot of people out there who would really like this product that don't know about it.

I'm also writing to ask if there are any other similar products available or coming soon from your company. Any new versions of this one planned at some future point? Thanks again for a great product!

Paul Wright
via America Online

[Stay tuned. We will not disappoint. — Ed.]

INSURE THING

I've been concerned about insurance for several years (since my home studio started growing), and now that it has moved into a commercial facility, insurance is an even bigger issue since I have more clients in and out and I don't live there (not officially anyway, but don't ask my wife!).

I insured \$60K worth of gear for about \$250/year at my home. That got me full replacement value and some liability insurance. I had an Inland Marine rider attached to my homeowners policy.

Now that I'm in a commercial setting, my insurance company (Erie) wanted a real security system and my landlord wanted higher limits as well. I'm no longer on an Inland Marine rider (I have some all-in-one plan) and am now paying about \$450/year. Hey, it's a deductible expense and I sleep a whole lot better knowing that my butt is covered if someone cases the joint during a studio tour or if I lose the whole thing to a fire.

Garry Simmons
Simmons Recording
Pittsburgh, PA

SOMETHING STINKS

Although I enjoyed your Q&A with Hans Zimmer, I can't believe there was no mention of the fact that he has no nose, as evidenced by the article's two-

page spread. I guess as long as he has two good ears, that's all that matters.

Naomi Vieux
Oakland, CA

MAKE ROOM FOR HANS

I have just purchased an issue of EQ because of the article of Hans Zimmer, who is one of my favorite film composers. The cover caught my attention, and I want you to know that I enjoyed the article, but at the same time, I feel that you should include greater details of recording and composing techniques of high-caliber artists like Zimmer. I hope that in the future you would not be so timid in extending a much greater number of pages, since you have the fortune to interview such high-powered profiles. Extend the article into two or three issues if you must, but please don't be so shy in cramming your magazines with details; in short, don't edit so much. You guys would never know how much even supposedly meaningless information could indeed be the knowledge that we are looking for.

For a little plug, in December '95 my company is releasing a new electronic new age music album in the league of Vangelis and Yanni. It has been sweetened by Spatializer Surround Sound and it sounds just a knock out! Anyway, in the future good luck on those heavyweight artists.

Henry Chandra
President
Apin Records
Salt Lake City, UT

CILETTI-BRATION

Just a quick note to tell you that I very much appreciate the columns that Eddie Ciletti has been writing lately. (Specifically those addressing maintenance and servicing techniques for DAT and ADAT.)

Rather than scanning expensive service manuals for hours on end and trying to learn new techniques, those articles have been very informative. They cut to the bone.

There's a lot of us technician/musicians out here, and we gobble up this stuff faster than you can say Craig Anderton. If Mr. Ciletti put out a book I would certainly buy it.

Mike Firis
Seattle, WA

CARRY PROTECTION

This letter is regarding Roger Nichols's column in the September 1995 issue. The subject is copy protection, in particular Digidesign's and their method of dealing with this subject.

We have experienced the same problem of "authorization error," and it is frustrating to learn that there are only three installations after paying thousands of dollars for a particular software. We have two large external hard drives and one small internal hard drive. To install programs in each, for the purpose of working on different projects, uses all the authorizations. A hard-drive failure reduces the number of installations and limits the use of the program.

If Digidesign is so good, and in my opinion they are the best for the money, wouldn't it be possible for them to develop a protection program? Even the "dongle" idea would be worthwhile. Perhaps greed or attitude of indifference may prevail. Judging by all the software out there competing with Digidesign, it seems they would be aware of this need for a better protection program, not the attitude of "3 shots and you're dead."

Why doesn't EQ request a survey of your readers who use Digidesign and learn from them if this problem is prevalent among the majority; then, present the facts to Digidesign to see what solution they'd offer to the predicament. It's worth a try. We out in this great hinterland of audio activity, oblivious of one another's problems, suddenly read Roger's article and immediately say, "Right on!" And usually that's as far as it goes. How about it?

[Oh, and as a personal note to Roger: I used to fly AT-6's (or if you prefer, SNJs) back in the good ol' days ('44, '45), but I'm not familiar with the Hawker Sea Fury. Where did they fit in at that particular time?]

Paul Dean
Creative Audio Designs
[How 'bout it readers: Send in your comments on copy protection and we'll pass them onto Digidesign. — Ed.]

WRITE TO US

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ALESIS
CIRCLE 02 ON FREE INFO CARD



DAT POPPING NOISE

Q I have a Panasonic SV-3700 DAT machine that lately has been experiencing some problems. When I use the jog shuttle to advance the tape, every once in a while I get an awful popping and distortion of the recorded material when I let go of the jog. This is temporary and usually goes away within a second or so. Sometimes, however, the noise will stay and I have to stop the tape, push Play again, and the mess is gone. Now I get the noise as well when I use the Skip ID button. I can see the meters on the DAT jump up and down when it pops.

What is this problem and how do I eliminate it? Is it time to have the DAT serviced? I'm using Ampex tapes.

I have to tell you that I love EQ magazine. It's great. Keep up the good work!

J. Bernert
via the Internet

A The symptom you describe usually indicates a problem with the tape path or tension. You may be able to confirm this in the following manner:

1. With the DAT recorder in Stop mode, simultaneously press the Mode, Reset, and Pause buttons. You should see the display switch over to read either AES or IEC.

2. Press the Mode button again. You should see a 4-digit display and very small orange "A" and "B" characters light up. This is the Error Rate mode.

3. Play a recorded tape that is known to be in good condition.

Note the average value of the four-digit readout while in Play. This readout updates approximately every second, so some fluctuation is normal. Then start shuttling the tape to induce the problem you describe. When you let go of the shuttle wheel and normal tape speed resumes, observe how long it takes for the error rate to return to the initial range you noted at the beginning of playback. A healthy mechanism should take about one

second to stabilize. Of course, if you can't get a stable reading even in initial playback, or if the value remains higher than 0075, then there are other problems with either the tape or the mechanism, which invalidate this test.

If the reading takes longer than about one second to stabilize, or doesn't settle at all after coming out of the Search mode, then there is a problem in the tape path. If this is the case, there are too many possible causes to name them all, but possibilities would include dirty capstan or pinch roller, insufficient back tension, or weak take-up torque.

In order to find the exact cause, you need to get the DAT examined by a person trained in troubleshooting and repair of this mechanism. Please call 1-800-526-6610 for the location of your nearest Panasonic DAT authorized Servicer.

David Tarlowe
Senior Product Engineer
Panasonic Broadcast & Television
Systems Company

BAKING TIPS

Q I am looking to restore unplayable old reel-to-reel tapes from the '70s and '80s. The backing on the tape has become sticky and prevents a smooth passage through the head block. The residue builds up on the heads and the capstan so quickly that it makes transferring this music to DAT almost impossible. One partial solution is placing the pancake right in a turbo oven at 130 degrees for nine hours. This works well for the most part, but it doesn't work on some thinner tapes (like 1 mm). We also have employed a system of slowly adding alcohol to the tape as it passes through the tape guide. This keeps the heads and capstan clean as the tape passes, but too much alcohol will allow the tape to move through too quickly, resulting in a pitch fluctuation. I would appreciate hearing from someone if you have a solution.

Scott Metcalfe
Metcalfe Productions

A The "Sticky Tape Syndrome" is caused by a breakdown in the plastic binder used to hold the oxide particles onto the basefilm. This problem has been observed by virtually every tape manufacturer and its causes are

numerous enough to fill this entire magazine. The mechanism is well understood; the long polymer chains of the binder break apart (based on tape age and storage conditions) into short polymer chains. When this happens, the tape transforms from a durable and rugged material into something resembling bubble gum in a worst-case condition. By exposing such a tape to an elevated temperature, the heat acts as a catalyst to recombine the polymer chains and the initial ruggedness of the tape is restored.

The following procedure should be used to restore degraded tapes:

1. Do not attempt to physically clean a tape in this condition; the surface could become permanently damaged.

2. Do not use any liquids to clean the surface; they could degrade the lubricants and other additives in the tape.

3. Take the tape out of the box and place it in an oven. Slowly increase the temperature to 121 degrees F (20 degrees C) over the period of an hour. Make sure the tape is on a reel with flanges; a pancake of tape will fall apart during the baking cycle.

4. Leave the tape at 121 degrees for 24 to 48 hours (72 hours for 2-inch reels).

5. Slowly return the oven to room temperature (usually turning off the power works well). Do not remove the tape while still warm; this will cause it to absorb large amounts of moisture.

After baking, the tape pack will be very loose because of differential thermal expansion, so exercise your tape before playing it.

This "fix" typically lasts from 30 to 90 days, so make your dub as quickly as possible. A tape can be rebaked many times, so don't throw out your master. The baking temperature is low enough so that it will not melt plastic reels, splices, or affect the tape's lubricants.

Our experience has shown that an electric convection cooking oven works adequately for baking tapes. Whatever type of electric oven is used, it is imperative that the temperature not be allowed to go higher than 125 degrees F or tape damage could result.

Thomas Neuman
Senior Staff Engineer
Quantegy (Ampex Media)

INSIDE
THE
PL4.0

The Best Sounding Amp
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PowerLight

4.0

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Switching Technology
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The new PowerLight 4.0 introduces massive power to a series of amplifiers that have already become a benchmark for excellent audio performance and reliability. **PowerWave™ Switching Technology** (patent pending), at the heart of the PowerLights, is **the power supply technology for the future**. The 4.0 clearly demonstrates why...

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The 4.0 achieves remarkable audio quality because **voltage supply to the output section is powerful and stiff**. There are virtually no sags following transients or long peak power demands. You won't hear typical modulation from AC ripple or garbling during clipping. The bass is ultra-clean and fat. Highs are pure and unstressed.

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A **PowerWave transformer "flies" at 115 kHz** (2000 times the frequency of a conventional transformer). Waste heat from resistance is almost nil. The supply is 90% efficient! And the 4.0 features **the latest three-step Class H linear output circuitry** for maximum audio quality and efficiency.

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QSC's renowned protection circuitry is enhanced by the PL 4.0's "smart" supply which matches power delivery to changing musical demand. The 4.0's thermal management keeps the amp cool under extreme conditions (even 2 ohm loads). And with the 4.0, **EMI and RFI are absent**, making the amp safe for wireless mics.

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4 PowerLight Models

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Don't be a Tape-based googlehumpher.



In 1856, Charles Darwin determined that the *Tape-based googlehumpher* species died off because of its failure to evolve with the times. 150 years later, E-mu's DARWIN 8-track Digital Hard Disk Recorder is proving to be the salvation of the digital recording species, with its highly evolved functionality and streamlined cost. It's true: DARWIN delivers the power of digital audio workstation-style recording and editing at a price every *Homo erectus* can afford.



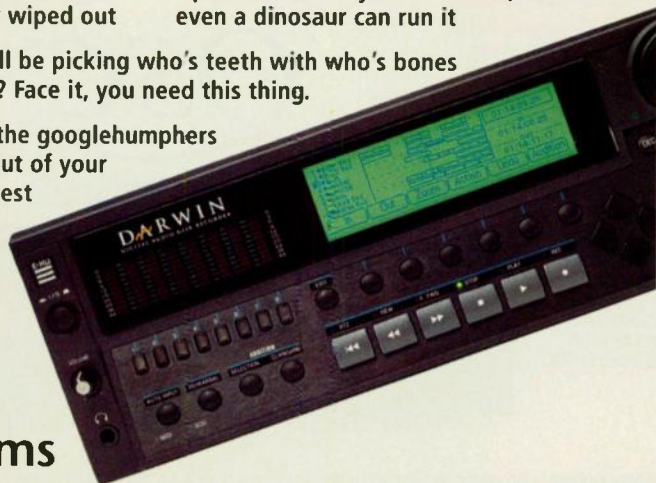
GOOGLEHUMPHERUS
TAPEZOIC PERIOD
Extinct due to its diet of magnetic tape,
limited brain power and incredibly
slow speed

Play music? Doing some recording? You won't believe what DARWIN will do for your creative process! That's because DARWIN's heart pumps with the power of non-destructive random access recording technology. Consider the benefits of that over taped-based beasts:

- Effortlessly cut and paste that perfect chorus throughout a tune
- Completely rearrange a composition without screwing up the original
- Instantly resurrect that insane guitar riff you accidentally wiped out
- Create a virtually unlimited number of tracks from a single unit
- Avoid time wasted waiting for tape rewind
- Operation so easy and evolved, even a dinosaur can run it

Any question about who will be picking who's teeth with who's bones in the recording food chain? Face it, you need this thing.

Don't make the mistake of the googlehumphers before you. Spit that tape out of your mouth and sail to your nearest E-mu dealer to learn about the DARWIN Digital Audio Disk Recorder in the flesh. After all, DARWIN is... the natural selection.



Although your problem has been described as an "analog tape flaw," it is actually only a formulation problem suffered by a couple of tape manufacturers who used binders containing a polyurethane plastic. This plastic, when subjected to humidity at even normal levels, turned out to be unstable after time. The problem has nothing to do with the medium being either tape or in the analog format. Tape manufacturers that did not use these polyurethanes did not have any of these problems with their tapes during this time period, and no manufacturer has used these formulations since the problem was identified.

The instability is due to the polyurethane's attracting water vapor and breaking down in the presence of the water. The trick is to drive the water out of the formulation to temporarily restore the tape so that it can be copied.

There are two ways to drive the water out of tapes with the breakdown problem: 1) Heat from a convection oven; or 2) Stimulation in a microwave oven. The first method is slow but relatively safe. The second is quicker but much riskier.

The convection oven has the advantage of uniform distribution of heat by means of an internal fan. We feel the Farberware model T4800 convection oven is an excellent model to choose for this restoration process (Farberware's phone number is 718-863-8000). The heat application you are using is ideal; roughly 8 hours at 130 degrees F. Although some plastic reels can be heated without a problem, it may be wiser to transfer the tape to a metal reel. An empty metal reel should be used as a spacer beneath any reels being treated so that the heated air can get around the tapes uniformly. The transfer process can begin once the reels are cool to the touch.

The microwave oven is trickier because one must calculate the heat being generated in proportion to the size of the tape pack. Metal reels cannot be used because they could cause arcing in the oven. Reel flanges can sometimes be removed from plastic hubs; if not, the tape will have to be transferred to a plastic reel. The tape pack should be rotated during the microwave treatment because microwave dispersion is not uniform. Some ovens have built-in turntables,

E-MU
E-mu Systems

To find your local E-mu dealer, contact: PO Box 660015, Scotts Valley, CA 95067-0015 • 408.438.1921
UK Office: Suite 6, Adam Ferguson House, Eskmills Industrial Park, Musselburgh, EH21 7PG • 44.131.653.6556

Making cool sounds. That's pretty much the purpose of all multi-effects processors, and a task that the Sony HR-MP5 executes extremely well. It all starts with our dual-effects block architecture. Each block boasts both an effect and an equalizer. These can be used at the same time to create the exact sound you want, with your



quality that's better than expected for the price...smooth reverbs, digital clarity but with a warmth that sounds distinctly undigital."¹*

Yes, the Sony HR-MP5. It's versatile, convenient, affordable, and great sounding. In conclusion, allow us to leave you with some quotes from Keyboard Magazine, who wrote, "...clean

GET GREAT RECORDING EFFECTS WITHOUT BANGING YOUR HEAD AGAINST THE WALL.



OF COURSE, WE COULD MAKE THAT SOUND PRETTY COOL AS WELL.

choice of a serial, parallel, or dual mono configuration. Throw in the fact that each preset can be programmed with a different configuration, and it all spells one magical word: versatility.

With the HR-MP5, you get an abundant variety of effects, 51 in all. These include Delay, Chorus, Flange,

Pitch Shift, Reverb, and Dynamic Filtering. Add to the menu 100 pre-programmed and 100 user-definable presets, and it's easy to see that the HR-MP5 has a fully stocked effects buffet.

But don't just take our word for it, listen to what the experts are saying. Such as EQ Magazine, "Sound

and smooth presets...the display is big, bright and packed with information ...friendly, easy-to-understand icons at every turn...this user interface is one of the best we've seen,...A+ for Sony."²*

What more can we say? For more information, call 1-800-635-SONY, ext. MP5.

SONY

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¹"EQ, August 1994." ²"Greg Rule, Keyboard Magazine, April 1995."



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but there are also separate versions available. An oven with a power rating of 600-900 watts that has its lowest rating at 10 percent (60-90 watts) would be able to treat a 7-inch reel of 1/4-inch tape in 2.5-4 minutes. A 10.5-inch reel of 1/4-inch tape in the same oven would take 7-10 minutes. This is only a rough guide, and one must be very careful not to damage the tape by overheating it. That is why the convection oven process is much safer.

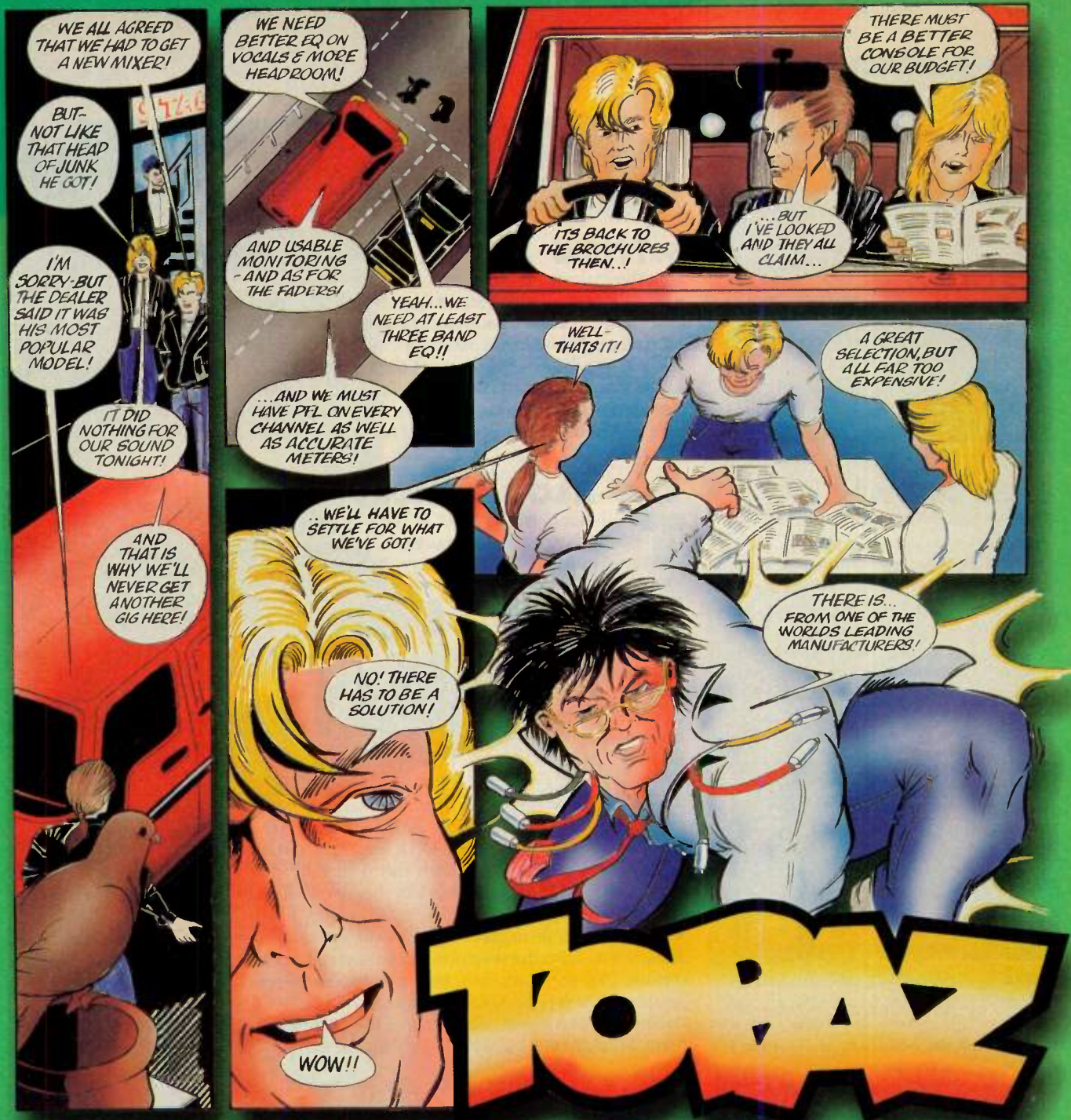
Thinner tapes, such as those coated on 1 mil base film (35 microns thick including the coating), should work as well, but they do have a tighter head wrap that could aggravate the problem. Those tapes should be rewound at a slow speed, if possible, to reduce tensions in the tape pack before the heat treatment. Sticking can be reduced by a head lubricant designed for magnetic recorders. Alcohol is a solvent and should not be used because it is likely to damage the tapes in the process of dubbing. Alcohol is a good cleaner, but it should not get on tape.

Digital storage media offers the best sonic qualities, but, in general, also pose the greatest risk because their design goal has been to increase recording densities as a trade-off for risk. Analog tape adds another 3 dB (doubling) of tape noise because one is recording noise on top of inherent tape noise, but this medium does offer methods of reducing storage risk by increasing track widths or recording speeds. BASF made recordings on the first analog tapes 60 years ago, and these recordings sound better today than they did then due to better heads and electronics. Today's tapes are far better, so one ought to feel confident that new analog recordings should last at least another 60 years.

Terence O'Kelly
Director of Sales and Marketing
Professional Products
BASF Magnetics Corporation

This is where your questions get answered. Send your queries to:

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



Where have all the features gone? - Same place as the audio quality! In order to make consoles more price competitive something had to give. But try telling that to Soundtracs. They've used their years of experience in console design to create a range of cost effective mixers that lack for nothing in terms of features and performance.



Consider the Topaz Macro, a traveling compact mixer designed for gigging bands, larger clubs and stereo recording. Inputs? You get 10 ultra low-noise mic/line and 4 stereo. All easy to set up, thanks to on-board PFL. Then there's the EQ, 3 fixed bands of carefully chosen frequencies for expert signal shaping and tailoring. And of course you get the Soundtracs sound. The Topaz Macro - mixing on the move.



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Soundtracs is exclusively distributed in the U.S. by Samson Technologies Corp., P.O. Box 9031, Syosset, NY 11791-9031. For more detailed information about the wickedly ingenious new Topaz Project 8, Topaz Mini and Topaz Macro consoles please call (516) 364-2244 Fax (516) 364-3888 or write to Samson.

CIRCLE 53 ON FREE INFO CARD

EQ

PRODUCT VIEWS

TEK A LOOK AT THIS

The 764 Digital Audio Monitor by Tektronix combines traditional level and phase monitoring with digital measurement and analysis. The 764 is the only digital-audio monitor to employ interpolation to calculate audio levels. The unit's display allows viewing of four audio channels, user-selectable ballistics, and statistical information about the session. Users can obtain information through waveforms in analog format or by English language descriptions of digital information. For more information, contact Tektronix Measurement Business, P.O. Box 1530, Pittsfield, MA 01202. Tel: 800-426-2200. (Press "3" when prompted and ask for code 458.) Circle EQ free lit. #113.



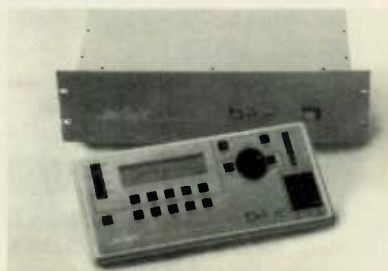
Master 938 is available in 40- and 60-minute recording times. For more information, contact BASF, 9 Oak Park Drive, Bedford, MA 01730. Tel: 617-271-6587. Circle EQ free lit. #112.

YES, MASTER...

BASF recently announced its new 8-track digital audio recording cassette for the ADAT format, the Digital Master 938. The 938 line features an ABS plastic S-VHS shell and a user-friendly sliding erase tab to prevent accidental erasure of valuable recordings. For archival purposes, the cassette is packaged in an impact-resistant plastic library case that includes a wrap-around index card for noting takes and tracks. Digital

WELL, HELLO DALI

Fairlight's Dali-2T is a digital 2-track designed with editing and mastering applications in mind. The Dali-2T was originally designed to provide a cost-effective platform for Fairlight's TimeFX software for time compression, varipitch, and varispeed applications. Other onboard DSP functions include real-time 4-band parametric EQ and a four-stage digital dynamic range processor, 2-track editing with adjustable crossfades, level management, and PQ encoding for CD makers. The Dali-2T also comes with a remote that features transport controls, a jog wheel, and dedicated buttons for all DSP and editing functions. For more details, contact Fairlight USA, 3855 Hughes Avenue, Second Floor, Culver City, CA 90232. Tel: 310-287-1400. Circle EQ free lit. #114.



DENON DOES MD

If you thought the MiniDisc was dead, think again. Denon's DN-1100R MiniDisc recorder features 10 independent Hot Start buttons. Tracks can be freely assigned to any of the 10 Hot Buttons on the DN-1100R and can be played back instantaneously with no gap time. A Cue Detect function cues the disc to the point where the sound actually starts rather than the beginning of the track, or to any desired point within a track. Other practical playback functions include track select, end-of-message prompting, fade in, fader start, and manual search. Recording functions include instant recording, auto track increment, manual track increment, digital coaxial (RCA jack) inputs, erase functions, and alphanumeric title input. For further details, contact Denon Electronics, 222 New Road, Parsippany, NJ 07054. Tel: 201-575-7810. Circle free EQ lit. #115.

LET'S TALK TAPE

TDK SM-X high-biased audio cassettes were engineered to deliver the highest possible sonic quality in professional studio recording applications. Featuring TDK's Super Avilyn magnetic formulation, the SM-X is enhanced by TDK's dual-coating process that creates a wider frequency response range. The SM-X also employs TDK's SP-AR II (Super Precision Anti-Resonance II) cassette mechanism that is designed to minimize modulation noise and assure phase accuracy and tape-travel stability. For more information, contact TDK Electronics Corporation, 12 Harbor Park Drive, Port Washington, NY 11050. Tel: 516-625-0100. Circle EQ free lit. #116.





Very, very, very, very,
very, very, very, very,
very, very, very, very,
very, very, very, very,
very, very, very, very,
very, very predictable.

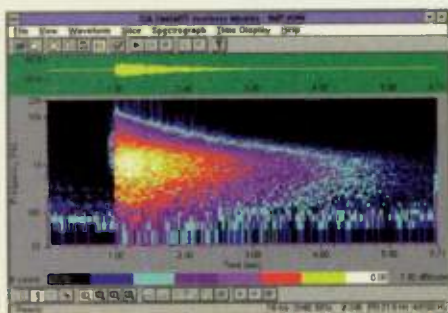
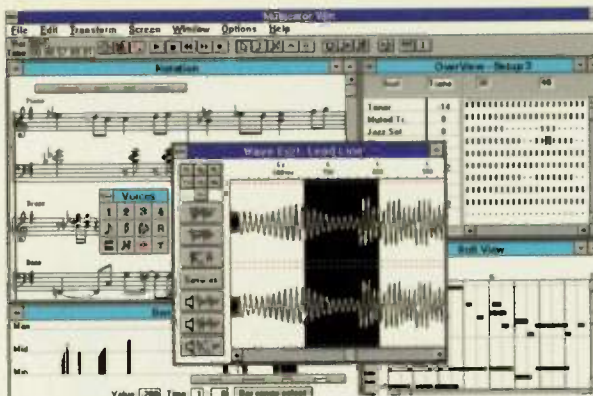
3M® 986 Audio Mastering Tape delivers consistent, true sound reproduction. Listen for yourself. You'll be convinced that no other +6 dB operating

level tape can match this performance. If you want more, try 3M 996, the industry standard high-output mastering tape. Call 1-800-752-0732.

EQ STUDIO WARE

WINDOWS OF OPPORTUNITY

Musicator of Norway has launched Musicator Audio, a professional music composition program for Windows that integrates 16 tracks of digital audio recording with 32 tracks of MIDI sequencing and music notation. Users can record up to 16 tracks of digital audio in CD-quality stereo or mono using any 16-bit sound card, 16 MB RAM, a Pentium processor and Windows 3.1 or later. For further information, contact Musicator USA, P.O. Box 16026, Oakland, CA 94610. Tel: 800-551-4050. Circle EQ free lit. #117.

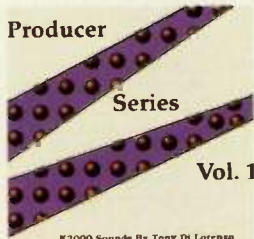


VEERY SMAART

SIA-SMAART is a Windows-based software package created by SIA Software Company designed to provide an accurate, practical, and easy-to-use measurement and analysis tool. The package consists of a utility module and three measurement modules — stimulus and response, signal analysis, and real-time spectrum analyzer. The SIA-SMAART modules allow you to measure quantitative acoustical values, measure room acoustics, easily find delays to adjust time alignment, and more. For more information regarding SIA-SMAART, contact SIA Software Company, Inc., 235 East 13th Street, Suite 6C, New York, NY 10003. Tel: 212-260-3817. Circle EQ free lit. #118.

ROM TO GROW

For use with the Kurzweil K2000 sampler is the *Producer Series Vol. 1* CD-ROM that features over 500 MB of samples from such classic synths as the PPG 2.3, Prophet VS, Roland MKS-80, Yamaha CS-80, DX, and TX. Users can choose from analog bass, brass, strings and pads, clavs, and electric pianos. Retail price is \$199.95. For more details contact Front Room Productions, Rd. 1, Box 400, Caryville, NY 12521. Tel: 718-449-2129. Circle EQ free lit. #119.



BY THE BOOK...

Digidesign's MasterList CD creates Red Book-standard CDs, 8mm DDP tape masters, or one-off reference discs playable on any commercial CD player. Version 1.2 features CD recorder support. MasterList CD is compatible with all of Digidesign's Macintosh-based digital audio systems. Version 1.2 includes full support for the Power Macintosh 7100 and 8100. For more details, contact Digidesign, 1360 Willow Road, Menlo Park, CA 94025. Tel: 415-688-0600. Circle EQ free lit. #120.

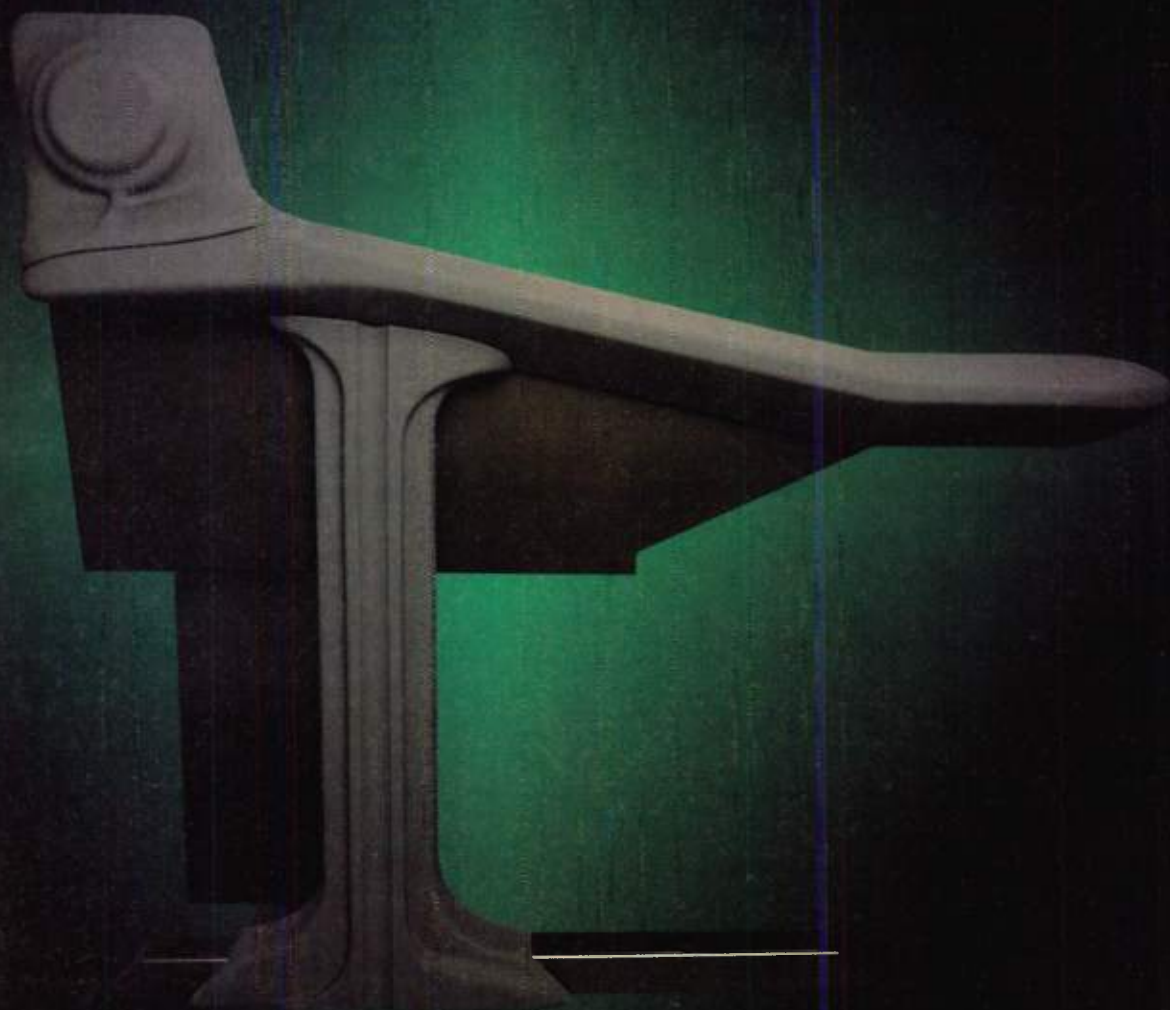
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1	0:00:00	standing on the edge	0:03:00:45	44.1	16	Red Book
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98	0:03:00:45	audio start				
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100	0:03:00:45	audio start				

TRIPLE VISION

Studio Vision Pro 3.0 is a MIDI sequencer and digital audio recording software that offers Audio-to-MIDI and MIDI-to-Audio. Pro's on-board DSP functions don't require any external devices or add-on cards, and are constructive when creating a new file. Your original file is always retained. When users select Audio-to-MIDI, Pro will open a dialog box where defaults are set based on the audio event you are going to convert. Then Pro opens a window that shows both the digital audio and the new MIDI representation of the same file. Here, users can begin the editing process, and when finished, choose MIDI-to-Audio, where users can choose which MIDI parameters will be applied to the original audio performance. When all of this is done, click OK and Pro will create a new digital audio file name including all of the edits. Studio Vision Pro 3.0 comes bundled with OMS 2.0, and Galaxy. For more information, contact Opcode Systems, Inc., 3950 Fabian Way, Suite 100, Palo Alto, CA 94303. Tel: 415-856-3333. Circle EQ free lit. #121.



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CIRCLE 03 ON FREE INFO CARD

Jacks Below

And Other Truths About 8-Bus Recording Consoles



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All Your AUXes. All The Time.

With 6 AUXes (2 are stereo), the TASCAM M2600MKII has more AUXes than any other console in its class. But the best part is — you can use all six — all the time. No other console in its price range can make that claim. That means you can use more effects, set up multiple independent stereo headphone mixes and have more flexibility. No limitations. And no repatching.

Get Out! Direct or With The Group.

A true sign of a recording console is direct/group switching. That's what makes recording with the TASCAM M2600MKII so smooth. Think about it. Send any signal direct to tape or disk by pressing one button. Or, send a group of signals direct to tape or disk just as easily — no patching here! You'll never have to crawl around or mess with your cables again. Spend more time recording and less time figuring out how.

The Features Demanded by Pros.

The M2600MKII has everything a great recording console should have — and more. It's an In Line configuration with flip switches. And you get your choice of balanced (+4dBm) and unbalanced tape ins and outs. Phantom power (48V) switchable in banks of 8 channels. And an optional multi-process meter bridge so you can keep your eyes on the board — and not your recorder. Plus, a semi-parametric split EQ on every channel and it's ready for automation using any of a number of third party packages.

Watch it. Do Those Switches and Knobs Wiggle?

Before you buy an 8-bus console check out the quality. Knobs and switches that wiggle are going to be a problem. For example, check out the controls and faders of the M2600MKII. No play, no wiggling. You can feel the quality. Feel those smooth long throw 100mm faders. Clean. And check out the ergonomics. Even the largest fingers will fit between the knobs. Try that on others!

Use A Solid Heavyweight.

TASCAM has built more recording consoles than any other manufacturer in the world. We know how to build a quality product that will last. The M2600MKII is a solid console. You can feel the difference just trying to lift it. Just compare it to the less serious lightweights on the market. Plus it comes with an extra heavy external power supply that delivers more headroom than anything else in its class. Just what you expect from the leader in multitrack recording.

Get Smart SmartSwitches™

The difference is in the design. This is a serious console. Take a look and you'll notice the design touches that distinguish the M2600MKII as the next-generation 8-bus console. Like TASCAM's exclusive self canceling and two-tone SmartSwitches — for protection from redundant operations and visual confirmation of all button positions at a glance. Quite a hassle on others!



Great Sound. The Next-Generation 8-Bus.

The real truth about a recording console is sound. With Absolute Sound Transparency™, high-end mic pre-amps, ultra low-noise circuitry, and high-output op amps, the M2600MKII is amazingly quiet, absolutely transparent and perhaps the best sounding console under \$20,000. And starting at only \$3,199, it's truly the sound decision for a next-generation 8-bus recording console. Put it on your shopping list today.



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CIRCLE 63 ON FREE INFO CARD

Focusrite EQ Software

See what this TDM plug-in for Pro Tools III can do for your system

BY STEVE LA CERRA

While traditionally manufacturing high-end audio hardware (some of it designed by none other than Rupert Neve), Focusrite has recently introduced an EQ plug-in for the Pro Tools/TDM bus. This software provides high-quality digital equalization modeled after its RED 2 parametric equalizer. [For a review of the Red 6 mic preamp/EQ, see page 102. —Ed.] The plug-in is significantly less expensive than a stand-alone EQ processor of similar quality, and it allows easy on-screen editing, program storage, and the ability to run multiple EQ processors for the price of one plug-in.

The Focusrite EQ software is accessed within Pro Tools (or any application that supports TDM) in the same way as other DSP processing: click and select from a mini-menu. Users can use the Focusrite EQ on an individual track (insert style), or they can use it via an effect send and return for processing of multiple tracks. The Focusrite EQ has three distinct configuration types (accessed via a pop-up window) with up to 18 bands per DSP chip, including mono and stereo versions. The three configuration types (which can be used stereo or mono) are: 6-band, 4-band and single-band EQ. The 6-band configuration includes high- and low-pass filters (with a selectable slope of 12 or 18 dB/octave), high- and low-shelf, and high-mid and low-mid peaking-type equalization. The 4-band configuration provides high- and low-shelf type and high-mid and low-mid peaking-type equalization, while single-band EQ configuration can provide any one of the previously mentioned styles of EQ.

Now why would you want to use only a single band of EQ when so much more is available? Because the available EQ bands can be configured in multimodule



PLUG IN, DROP OUT: Get the famed Focusrite EQ on your Pro Tools system with the new plug-in.

modes, allowing you to assign the modules with more extensive EQ capability to the tracks that really need them. You could, for example, assign a single-band module to a track that needs just a bit of brightening and a 4-band module to a track that needs more drastic EQing.

The user interface for the Focusrite EQ mimics a hardware EQ by using on-screen rotary control knobs and illuminated push-button switches that light when engaged. Each control has a corresponding alphanumeric entry/display area with white characters against the red "brushed-aluminum" background for which the Red 2 is famous. In addition to adjusting controls via mouse, the Focusrite EQ permits direct keyboard entry as well as arrow key increment/decrement, while the alphanumeric entry/display area is also active. Activation of a field is achieved by clicking on the area or using the tab key to navigate through the various fields. Option-clicking on a control or alphanumeric display area makes the EQ parameter revert to the default setting, while command-clicking allows a finer resolution of adjustment.

Focusrite has thoughtfully included several metering functions to make using the plug-in easier. A two-mode graphic display shows EQ settings in either Left- or Right-Only mode and Dual mode. When in Left- or Right-Only mode, the graph shows the EQ curve applied to the selected channel. In Dual mode, the left and right audio

channels are linked. Any changes to the EQ curve will be applied to both channels and will be displayed with a single EQ graph. Metering is accomplished with high-resolution plasma-type meters along with "analog-type" sample-clip indicators.

The Focusrite EQ plug-in is designed to use a single DSP chip for emulating the character of a high-quality analog EQ, and if ever there was an analog EQ to emulate, it certainly would be a Rupert Neve design. But unlike most hardware EQ units, the configuration of the software EQ plug-in can be defined (and stored) for specific purposes on a per-session basis. Hardware patching is eliminated (!) and studio owners don't have to pay for redundant parts such as rackmount enclosures, power supplies, and circuit boards (although some studio owners like to have all that hardware around — it helps keep the control room warm in the winter). Like all TDM Plug-Ins, the Focusrite EQ essentially becomes part of a Pro Tools system without need to switch between multiple programs (and dynamic automation of EQ parameters will be supported in Pro Tools 4). Digidesign, which will distribute the Focusrite EQ plug-in, says it will be priced under \$1000 and will ship around the end of 1995.

For more information, contact Digidesign, 1360 Willow Road, Ste. 101, Menlo Park, CA 94025. Tel: 415-688-0600. Circle EQ free lit. #122.

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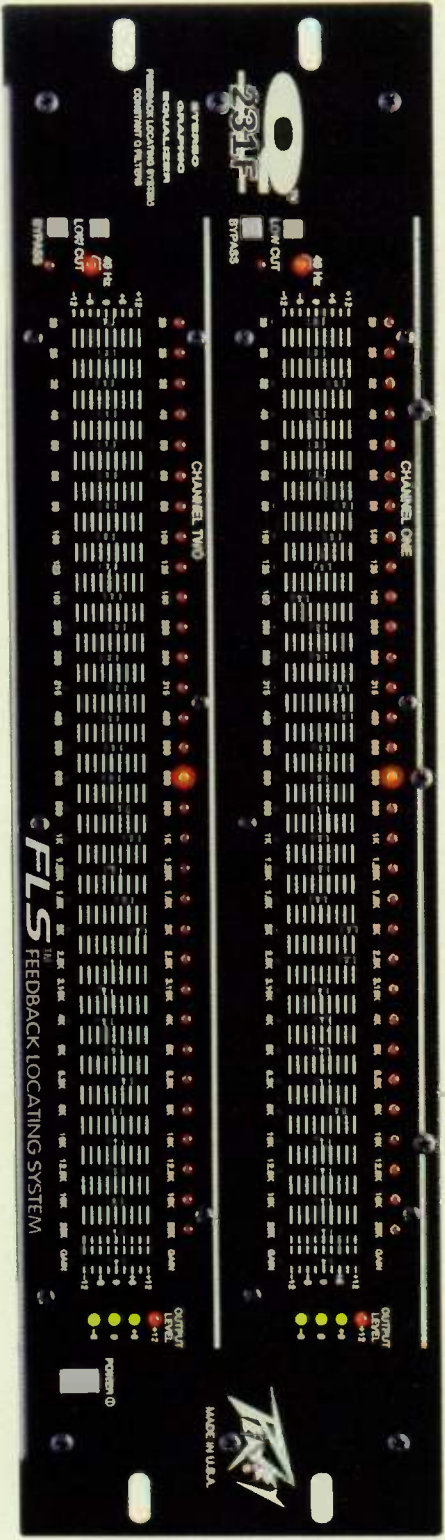
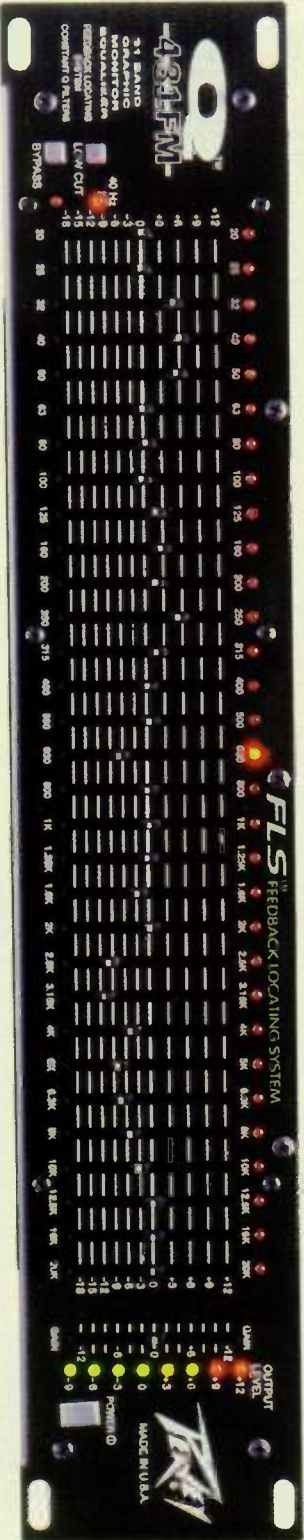
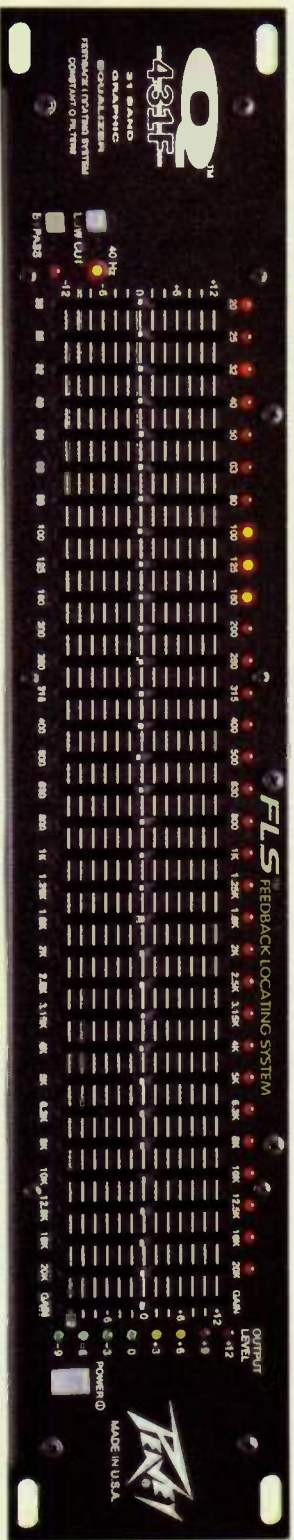
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CIRCLE 35 ON FREE INFO CARD

The Rentals "Friends of P."

EQ speaks to Rentals
songwriter/producer/artist

Matt Sharp and
engineer/producer
Tom Grimley

BY STEVE LA CERRA

EQ: What made you decide to use Moog synths on this recording?

Matt Sharp: There's Moog on the entire record, and it is just a sound that I like. I think that between 1978 and maybe 1981 (or so) was the only time that synthesizer sounds were really together. The synth sounds on

some of the super-early New Wave records are just so good, but after that — once technology got a little too far ahead of itself — they really went downhill. I think that when you make a record, you want to use sounds you like, work with people you like, and record songs that you like.

Tom Grimley: We originally recorded the project on a 1-inch, 16-track analog tape machine about two years ago here at Poop Alley (Grimley's studio in Los Angeles). Between then and about eight months ago, Matt and I were listening to Gary Numan and just about anything Jeff Lynne has done and decided to make it some sort of epic record. So we bought a digital 8-track (a TASCAM DA-88) and we tracked keyboards on the songs. We slaved the DA-88 to the 16-track 1-inch and it worked great.

Do you recall which Moog was used on the recording?

MS: We used only a Moog Source, a monophonic synth.

Did you have any problem keeping it in tune?

MS: You tune it every time you are ready to record a section. They do go out of tune. I think Tom's goes out of tune a little more than most, but it's not that much of a problem. It doesn't go out of tune any more than a guitar or a bass does, so you treat it similarly and tune it before a take.

TG: I think that the Moog Source synth is pretty good. But when you first turn them on, they are a little weird. We had a tuner hooked up to them all the time and we would have to tune them a lot. I used to do a lot of work with miniMoogs, and they are terrible. I have played on one [mini-Moog] that was good, but I worked at a place where we had two of them and they were always a nightmare. The Source is not as bad, but I'm not really sure why. It seems to vary. Matt is on tour now and he has four Sources. They are all different, and they even sound different.

Did you have those sounds in mind when you wrote the song or did they come about during the recording?

MS: Tom programmed all of the sounds on the record. Basically I would tell him what I wanted and he would get the sounds. They're pretty obvious. The Source is pretty versatile, but it'll only get certain things, and for this record we had very specific sounds in mind.

Is that dirty fuzz-bass sound also made by the Source?

MS: Yes. The synth doubles the bass and they are actually both distorted. For my bass, I use an old Orange head, and it's a combination of the two. It's hard to tell which is which sometimes because they are really similar sounding.

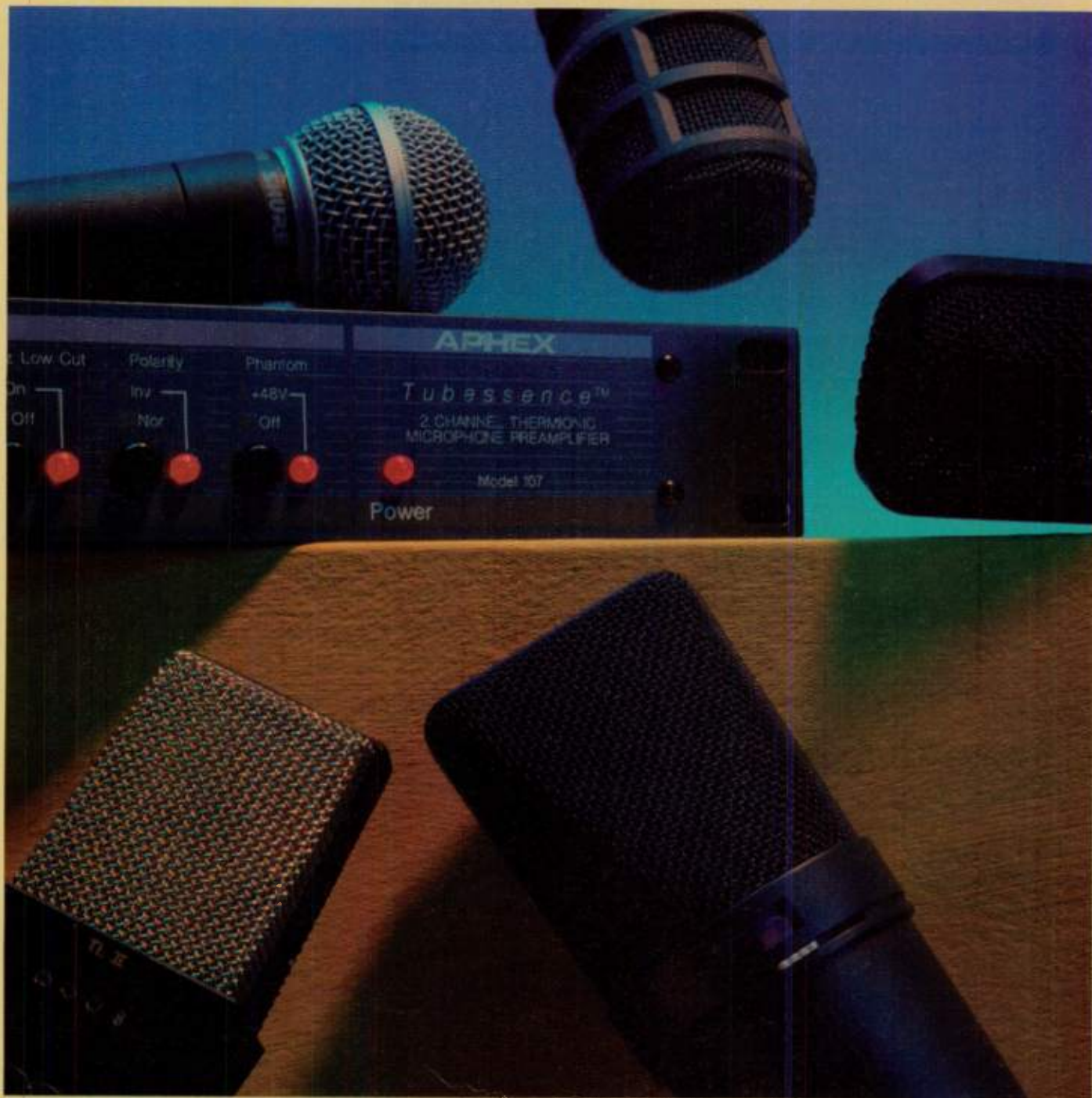
Do you recall how that sound was created?

TG: It's patch number 5 and I turn the attack to zero, the decay and sustain to 99, and the release to 0. I make sure the oscillators are set to the 32-foot pipe and turned up all the way. I keep it as low and as simple as possible.



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How were the Moogs recorded?

TG: I plugged them straight into the DA-88 from a tube preamp, without EQ or compression. I wouldn't EQ it to tape, but if I was having trouble in the mix I might EQ it a little bit. It depends in the end on how it sounds in the mix. For the most part, the Moogs sound great and you can't really screw the sound up.

There is a synth harmony in the B section, before the chorus. Did you play that in one pass?

MS: It's probably two. I don't really know how to play synth, so when we started doing Moogs it would be one or two songs a day. I'd sit there and fiddle around until I came up with a part I really liked, which would take a while since I was writing on the fly. I'd write the parts right before I recorded them, figure out how to play them, and then record them.

Was the Source used to double up on the violin?

TG: No, that was all acoustic violin. I think we did six tracks of violins with (vocalist/violinist) Petra Haden.

How did you record the violin?

TG: It was just an AKG C414 set to the figure-eight pattern, about four feet away. The room is a live warehouse-type of room, and I kind of aimed the figure-eight into the corner. Petra is also in the band "that dog" and I have been recording her playing violin for about four years. I usually use an old weird tube mic preamp that sounds nice. The violin was recorded to the DA-88 on all the songs.

Do you generally avoid EQ when tracking?

TG: I rarely EQ — even when I mix. There are no effects on that song. There is no compression either except for maybe a bit on the kick. Definitely no effects, and if I ever use anything it's just compression.

Did you compress the mix?

TG: The song was mastered by Stephen Marcussen at Precision who works with Manley tube gear and I know he did a lot of limiting. I might have compressed the kick and maybe the vocals a touch. If I compress anything, it's always like a 2:1 ratio — real gentle. Or maybe 4:1 if I'm going crazy. For the most part it's nothing. **EQ**

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200 programs and 100 setups: 8 MB of Kurzweil's most spectacular sounds. Plus, it comes with a disk containing over 1,000 more of Kurzweil's finest programs. With optional soundblocks – *Orchestral* and *Contemporary ROM* and the new *Stereo Grand Piano* – the **K2500 Series expands to 28 MB of internal ROM sound.**

Interfaces with
Alesis ADAT[™],
Tascam[™]
DA-88
& AES/EBU
via the DMT[™]
Option.



76
88

The K2500 Series: Kurzweil's most powerful instruments ever. They integrate state-of-the-art synthesis, sampling, effects, sequencing, advanced file management, true 48-note polyphony and V.A.S.T. processing plus much more in one instrument. Your musical revolution begins with a single step. Seize the power. Play the **K2500 Series** at your local Kurzweil Authorized Dealer.

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Den of the Weasel-Boy

STUDIO NAME: Weasel-Boy Recording

LOCATION: Brooklyn, NY

MAIN MAN: Frank Heller, owner

CREDITS: LL Cool J; Lords Of The Underground; Snow; Was Not Was; Madonna; 808 State; Heavy D.; Quincy Jones; James Brown; New Kids On The Block; Steve Winwood

CONSOLE: Mackie 32•8 and CR-1604 linked and automated

KEYBOARDS: Korg DW8000, M1EX, and 05R/W; Roland D-50, MKS80, MKS70, JD990, SC55, and Jupiter 8 (w/MIDI); Yamaha DX7II, TX7, TG-77, TG-33, and DX21; E-mu Proformance+, Proteus 1, Proteus 2, and Proteus 3; Kurzweil K2000 and MicroPiano; Sequential Prophet VS; Casio VZ10M and CZ101; Arp Odyssey and 2600

SAMPLERS: Akai S-1000 and S-950 (with 16-bit Marion card)

MONITORS: Yamaha NS10M's; Tannoy PS-88 subwoofer and Bose Roomates

AMPLIFIERS: Two Stewart PA-50B's

COMPUTERS & SOFTWARE: Macintosh Powerbook 520c running Mackie Ultra Mix Automation and Steinberg Cubase

Score 2.00; C-LAB Falcon 030 running Steinberg Cubase Audio Falcon and AB Vinga Zero-X software, interfaced with Opcode Studio 4; KMX 15x16 and KMX 8x8; JLCopier MSB; Steinberg SMP-II

RECORDERS: TASCAM DA-88 [2] with SY-88 sync card and AE-88 interface; TEAC 3300 1/4-inch 2-track reel-to-reel

DAT MACHINES: Panasonic SV-3700; Casio DA-R100

MICROPHONES: AKG C451, C460, and C1000; Audio-Technica AT4030; Beyer 740N; Nakamichi CM-100; Neumann KM-84; Sennheiser MD-421; Shure SM57, SM58, and SM53; Sony ECM MS5 stereo, ECM22p, and ECM909 stereo

STUDIO NOTES: Engineer Frank Heller explains: The studio was designed to be extremely low noise, ergonomically efficient and compact. It has been separated into the two basic food groups: MIDI and audio. All of the audio gear surrounds the two Mackie consoles on one side of the room while all of the sequencing and MIDI gear is on the other. My two secret weapons are the

Mackie Ultra Mix automation system and Steinberg's Cubase Audio Falcon running on a C-LAB Falcon Mk-II. The Steinberg/C-LAB combo is little known here in the U.S., but well-known in Europe. It is one of the best-kept secrets in the audio business. One-hundred and twenty-eight tracks of MIDI with eight discrete channels of digital audio out of one box. You can't beat it with a stick.

EQUIPMENT NOTES: Heller continues: I am using Mackie's Ultra Mix automation system all the time. It is very simple to operate system that can be retro-fitted into any console and provides full 32-channel prefader metering as an extra bonus. My clients have been totally blown away.

The 1604 (with the Otto module installed) is tied to the 32•8 via the expander connector, while Ultra Mix automates them both. This provides me with fader, mute, and solo capabilities for 59 channels. Oh yeah — the studio was named after my old band, The Rhythm Weasels. **EQ**



A NEW YORK-BASED PROJECT STUDIO GOES AUTOMATED

Photo by Julian Jaime

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

**2nd-Generation
Transwaves™**
(with digital resynthesis)

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(four 18-bit DACs)

totally new
totally awesome

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

SoundFinder™

GM Compatible

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

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

We've made selecting sounds a breeze with our proven SoundFinder™ interface – one knob selects

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

Whoops - ran out of room! So if you want to hear all the other totally cool things about the MR-rack (like the PCMCIA card

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CIRCLE 25 ON FREE INFO CARD

Neumann U48

This vintage mic is as
good as gold

MICROPHONE NAME: Neumann U48
PRICE: About \$350 when new (1950)
TYPE OF MIC: Vacuum tube condenser
POLAR PATTERN: Cardioid or bidirectional
TUBE TYPE: VF-14M
FREQUENCY RESPONSE: 35 to 15,000 Hz
SENSITIVITY: 2.0 millivolts/dyne/square centimeter
RATED SOURCE IMPEDANCE: 200 or 50 ohms
TOTAL HARMONIC DISTORTION: Less than 0.8% (@ 1000 Hz) for sound pressure levels of up to 110 dB.
POWER REQUIREMENTS: 105 volts DC @ 40 milliamps, provided by the Neumann NG Power supply
MIC NOTES: The gold plating on this particular U48 is strictly for cosmetic purposes and has no effect on the sound of the mic. It is possible that the mic was manufactured with the plating by Neumann as a custom-order, but the folks over at Neumann told *EQ* that that would be difficult to ascertain. It was recently put on the auction block at a vintage equipment auction hosted by Hamilton Brosious Associates, but was not sold.

The Neumann U48 employed the legendary M7 capsule, which was developed by the company in 1932. The original M7 design used a PVC diaphragm glued to the backplate, but Neumann engineers discovered that over long periods of time the PVC became unstable and was subject to decomposition. Around 1959, the capsule in the U48 was changed to the K47, which used a Mylar diaphragm clamped (instead of glued) to the backplate. Neumann used the clamping method for two reasons: First, adhesive technology had not yet developed a glue suitable for use with Mylar; and second, clamping the diaphragm to the backplate allowed Neumann to control the tensioning of the diaphragm much more accurately. The Mylar material was more durable and environmentally stable than PVC. The K47 capsule was used in the microphone until Neumann discontinued the '48 in 1965. **EQ**



Photo by Howard Sherman

Worth its weight in gold—and *platinum*.

Tony Brown discovers the AT4050 studio microphone.

With 8 gold and 14 platinum records, 41 number-one singles, and 4 Grammy Award winning titles, record producer Tony Brown has a reputation for knowing excellence when he hears it. So it's no surprise that once Tony tried an AT4050 multi-pattern capacitor microphone, he's been using it ever since.

"I use it every session on something," says Tony. "There are several great mics that engineers always like to bring out—and this is one of them."

The Audio-Technica AT4050 delivers supremely transparent and accurate sound without sacrificing warmth and ambiance. The large-diaphragm design utilizes two capacitor elements to provide consistent, superior performance in three switchable polar patterns (cardioid, omnidirectional and figure-of-eight). Transformerless circuitry provides exceptional transient response and clean output even under extremely high SPL conditions.

And while it's certainly *worth* its weight in gold, the rich, versatile performance of the AT4050 is available for much less than \$400 per ounce!

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CIRCLE 06 ON FREE INFO CARD

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**S-DISC™
PROCESSING**

want, then program and listen to them instantly. No catches. Naturally, the TSR-24S has plenty of raw material, with an arsenal of more than 75 effects. Plus, multiple modulation effects

94 DB S / N RATIO

When it comes to sound, not even compact discs are as clean as the TSR-24S. Our Silencer™ digital noise gate wipes out noise by writing digital zeros when there's no signal present.

94 dB

SPECIAL EFFECTS

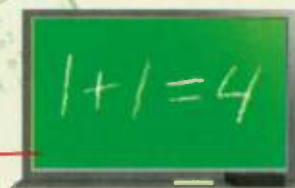
Take true stereo inputs, add four assignable outputs, and you get a lot of routing configurations. Let's see, there's stereo in, quad out; mono in, quad out; dual mono in, dual stereo out...well, you count 'em.

OVER 75 EFFECTS

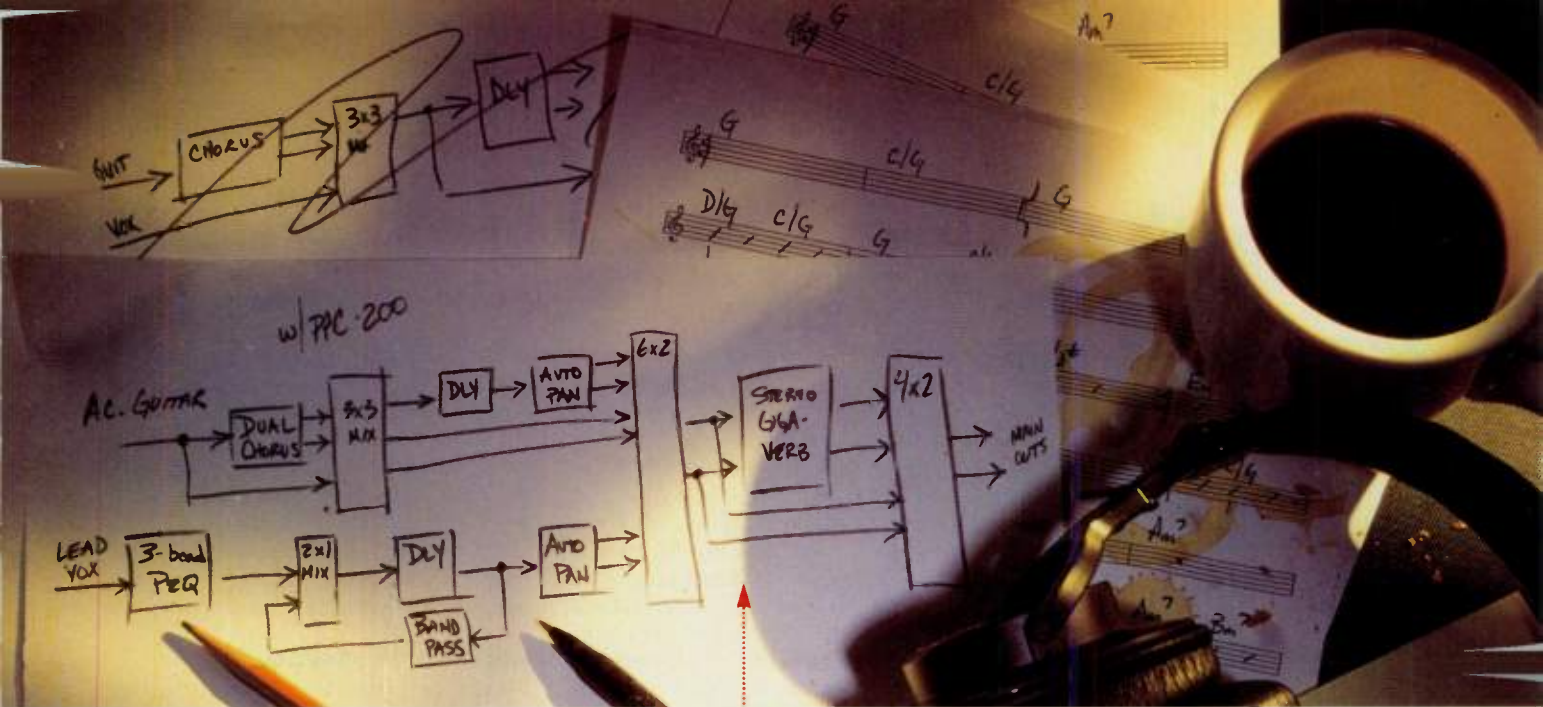
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Take true stereo inputs, add four assignable outputs, and you get a lot of routing configurations. Let's see, there's stereo in, quad out; mono in, quad out; dual mono in, dual stereo out...well, you count 'em.



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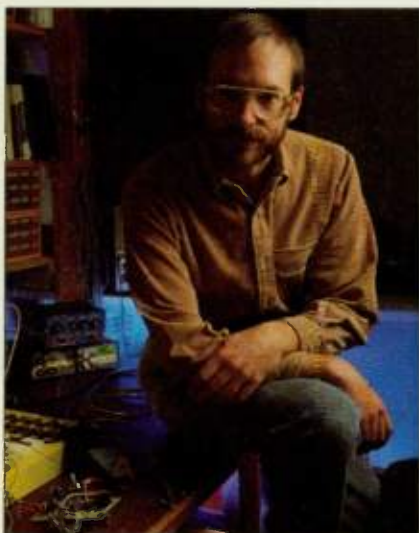
Want reverb, chorus and flange?
Press a couple of buttons.
Reverb, chorus and reverb again?
Redundant effects are not a
problem. Link effects in any
order to create algorithms, then
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combinations.



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CIRCLE 13 ON FREE INFO CARD

After the Crash



Picking up the pieces when the unthinkable happens to your computer

BY CRAIG ANDERTON

The question is not whether your hard drive will fail, but when. Given the computer-intensive nature of much of what we do in the studio, a hard disk crash can be anything from an annoyance to — if you haven't been careful about backing up — a major crisis.

I experienced this problem the other day with my Apple PowerBook 145, but it was no ordinary crash. The floppy drive's head assembly fell off while loading a disk, started flopping around internally, and the next thing that happened was the acrid smoke smell that says, "Expensive repair coming up." Much to my chagrin, the computer would no longer boot from the floppy or, more disturbingly, the hard drive.

Fortunately, I had backed up the computer prior to my last road trip, but during that trip, had done a lot of "housekeeping" — getting rid of old files, doing some correspondence, entering expenses, etc. I didn't want to

lose that time, so I started thinking about data recovery as well as repairs. First we'll get into the repairs part, then the data recovery.

Can you replace a hard drive? You can if you're willing to void your warranty, work very carefully, have the proper tools, and know how to prevent static electricity from zapping your computer. To take apart a PowerBook you need Torx wrenches, although inserting a jeweler's screwdriver between two of the opposite points in the Torx screw will usually let you unscrew it without stripping the head too much. Use non-Torx screwdrivers only in an emergency (like you're stuck on an island somewhere in Central America and the nearest Apple dealer is several thousand miles away; this actually happened, which just proves once more that necessity is the mother of using the wrong tools for the job).

Once you have the computer apart, the rest is pretty easy. Unscrew the hard drive from its mount and unplug the cable that goes into the back of the drive. Be careful not to touch any of the new drive's electronics with your finger if you've accumulated a static charge; place the drive on aluminum foil when it's waiting to be installed. Reconnect the cable to the new drive, then screw it into the

mount. Consider upgrading to a larger capacity drive while you're at it, if your computer can handle it.

Unless it was preformatted, you'll now have to initialize the disk. To do this, boot via floppy or a drive connected via SCSI and run hard-disk initialization software. For the Mac, this requires the Disk Tools system software disk, which is a bootable disk.

ISOLATING THE PROBLEM

I was very fortunate to have a trusting friend with a PowerBook 170 who let me swap out the drive to confirm whether that was indeed the problem. Substituting my hard drive for hers produced the same results as in my computer (nothing), so I at least knew the hard drive was definitely faulty. However, I also wondered if either the hard disk or floppy had taken out the logic board in the process of failing. If so, it would be stupid to replace both drives and the logic board (\$700 in parts alone) compared to just getting a new computer.

Next step: a call to Shreve Systems (Tel: 800-227-3971), an excellent source for Mac parts. They charge \$65 minimum to diagnose your computer and give an estimate, so I instead opted to plunk down \$99 for a hard drive to see if replacing that would at least solve the hard drive problem. If so, I'd get the

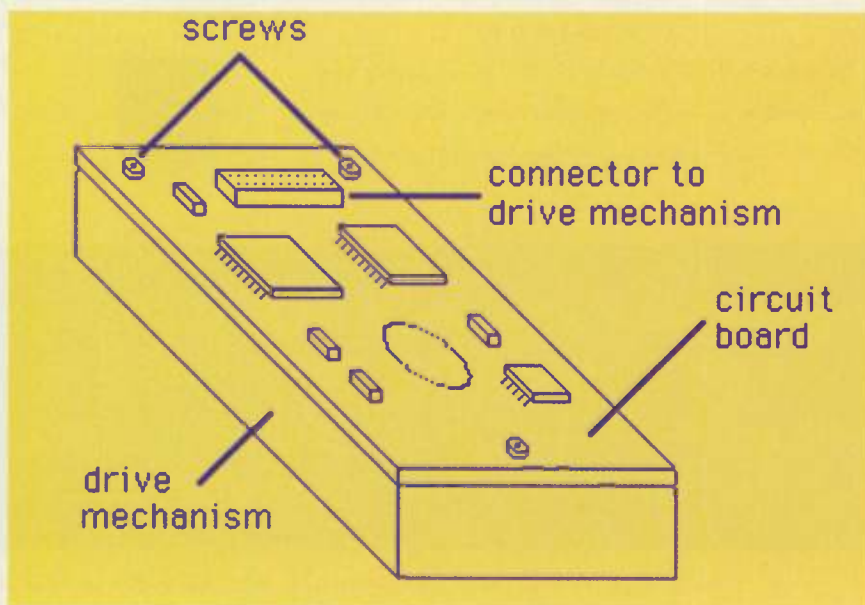


FIGURE 1: Typical drive construction.

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4 mono mic/line chs.

4 stereo line chs.

2 aux sends per ch.

2 stereo aux returns

Eff. return to monitor

3-band EQ w/Lo Cut filter

Mutes on every channel

4 buses via Mute/ALT 3-4

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Control Room monitoring

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This is the result. Same great value. Same built-like a tank construction. But with some exquisitely handy new goodies that make it an even more effective tool for recording and live performance. Including 3-band EQ, balanced XLR outputs, PFL Solo, channel mutes (with ALT 3-4 bus) and multi-source Control Room monitoring.

Visit your Mackie dealer (the MS1202 VLZ's in stock right now) or call us toll-free for detailed information.

- 1 3-BAND EQ** on all chs, PLUS...
- 2 LO CUT FILTER** (Chs. 1-4), dramatically extends useable bass EQ by cutting stage rumble, mic thumps, etc. just like on our 8-Bus and SR Series. VERY IMPORTANT!
- 3 60dB GAIN** on on first 4 channels via balanced mic inputs.

- 4 VIRTUAL PAD** on first 4 channels (line inputs only). 10dB attenuation with trim all the way down; Unity at 9:00 so you can add even more EQ to already-hot signals.
- 5 -10dBV RCA TAPE OUT INTERFACE**
- 6 ALL INPUTS & OUTPUTS BALANCED** (except RCA-type tape inputs)



- 7 PFL SOLO** on all channels makes level-setting via meters easy, Interrupts Control Room/Phones selection & ignites Rude Solo LED.
- 8 VLZ** (Very Low Impedance) circuitry for pristine sound.

- 10 AUX 1 PRE/POST** global switch.
- 11 EFFECTS TO MONITOR** lets you add reverb to your stage monitor mix, just like with our SR Series.
- 12 CONTROL ROOM/PHONES MONITORING** w/level control lets you select any combination of Main Mix, Tape In and Alt 3-4 signals for Phones, Control Room & meters. Plus you can re-route it back to the main mix!
- 13 MUTE/ALT 3-4** routes main mix to separate stereo bus.



- 9 BALANCED XLR MAIN OUTPUTS** with switchable 30dB pad for connecting to Mic Level inputs.

CIRCLE 32 ON FREE INFO CARD

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World Radio History

floppy (another \$200) and live happily ever after, albeit \$300 poorer. If not, then I knew the logic board was shot and I'd have to buy a new machine, at which point there would be no point in having spent money for a tech to look over the old machine anyway.

I installed the new drive in my friend's 170, and it worked. So I then connected the 170 to a SCSI drive and proceeded to copy over my most recent backup. When complete, I took the hard drive out of the 170 and installed it in my computer. I was very

relieved to see the machine boot and work properly. But this isn't the end of the story just yet.

THE BIG SECRET!

It's a little-known fact, but *a hard drive crash does not always mean your data is lost*. This is because the typical compact hard drive consists of the drive mechanism itself sitting on top of a board containing some pretty sophisticated control electronics. If the control electronics break down, the hard drive will show the symptoms

of a crash, but 99 percent of the time the data will still be intact. You just can't access it.

Hard drives are pretty rugged animals these days, and even with continuous use, you should get at least five or so years out of them. If the drive fails before then — particularly if it fails shortly after installation — the chances are very good that the mechanism is okay, your data is safe, and only the electronics need to be fixed. Here's how to proceed.

RECOVERING THE DATA

It's often possible to physically separate the drive mechanism from the electronics. Fig. 1 shows typical drive construction: the mechanism bolts to the electronics (this view shows the underside of the drive), and wires from the mechanism go to a connector that fits into a matching connector on the electronics board. Usually these wires will be a ribbon cable. Make sure that the replacement drive is *identical* to the "crashed" drive or you probably won't be able to take advantage of the following technique.

Unscrew the screws, then separate the two halves of the connector since this is now the only thing that holds the board and mechanism together. If you use a jeweler's screwdriver to pry the halves apart, be very careful. The traces on these boards are extremely thin, and scraping one accidentally could cause an open circuit that would be extremely difficult to trace down.

Now take the old drive mechanism and mate its connector with the one on the new electronics board. Screw the drive into place on the new board, install the assembly in the computer, and you're ready to go.

THE HAPPY ENDING

As luck would have it, the system booted fine, the data was still intact on the old mechanism, and I didn't have to reconstruct any data. Meanwhile, I have a new drive mechanism sitting around should the existing mechanism fail for real someday.

The most important part of a hard drive is always the data that resides on it. Hopefully you're conscientious about backup, but if you're not and your hard drive crashes, don't always assume the worst — the "crash" may be nothing worse than the computer equivalent of a fender-bender. **EQ**

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this, this and **this** out.

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CIRCLE 20 ON FREE INFO CARD

World Radio History

Kurzweil the Time Away

Tricks and tips on setting a program for a Kurzweil K-Series sampler

BY TONY DI LORENZO

Kurzweil's V.A.S.T. (Variable Architecture Synthesis Technology) system, used in its K2000 and K2500 synthesizers, is one of the most versatile synth engines available. Because of V.A.S.T., the K2000 and K2500 are capable of many types of synthesis styles, such as FM, LA, vector synthesis, traditional analog-style synthesis, and sampling. Since the sampling aspect of the K-Series really increases the sonic capabilities but is often misunderstood, let's work through the sampling process.

On the rack-mount K's front panel you'll see Optical In, LoZ left and LoZ right analog inputs, and a stereo HiZ 1/4-inch TRS analog input. I find that an ordinary insert cable with a 1/4-inch TRS plug on one end and two 1/4-inch TS plugs on the other end works fine for analog sampling. If you are going to use the XLR analog inputs, remember that pin 1 is common, pin 2 is high, and pin 3 is low.

Let's take a shot at sampling. Make sure you already have a box of HD floppies formatted for the Kurzweil, or you won't be able to save your work (more about storage later). We are going to

sample, in stereo, a short-decay bass sound from another synth. Connect the TRS side of your insert cable to the 1/4-inch analog input of the Kurzweil. Then connect the plug labeled "ring" to the right output of the source synth and the plug labeled "tip" to the left output of the source. On the front panel of the K, dial to 199 Default Program. Press EDIT, then press the button directly underneath the word KEYMAP. "Grand Piano" should be highlighted. Using the numerical keypad you can type in 168 and ENTER, which will bring you to a keymap called SILENCE. Press EDIT and then MIDI. You are now in the sampling page of the Ks. The top of this page should read, "SampleRecordSamples: xxxxK" where the xxxxK indicates the amount of RAM available in your unit. For instance, a 10 MB machine would read "SampleRecordSamples: 10240K."

Let's talk about the choices on this sampling page. You can move to the different choices by using the UP, DOWN, LEFT, RIGHT arrows and then dialing in the values of your choice.

Samp: This is where the name of the current sample will be displayed.

Input: Choose ANALOG for analog recording.

Time: Sets how long you need to sample, in seconds. The amount of time you have will vary depending on how much RAM is installed in your unit, what rate you need to sample at, and whether you are sampling in mono or stereo.

Gain: Choices are 0 dB, 7 dB, 14 dB, and 21 dB. I find that in most cases, 7 dB works fine. Watch the Gain setting carefully — you don't want samples

that have distortion due to clipping.

Rate: Choices are 29.4 kHz, 32.0 kHz, 44.1 kHz, and 48.0 kHz. The higher rates will use up more memory, so ask yourself if you really need to sample a kick drum at 48.0 kHz.

Mode: Choices are stereo, mono (l), mono (r), and trigger. Use mono (l) for mono samples. Note that in units with version 3 software, it is possible to use the sample input as a drum trigger.

Thresh: Choices are Off, -90 dB to -6 dB, and Key. When this is set to Off, the Ks start sampling as soon as you press RECORD. If your source is noisy, that noise will be recorded, too. Experiment with different settings and remember that you can use the Thresh control to set your sensitivity just above any noise that may be coming from the source's output.

Src: This will be set to EXT for sampling external sources. You can also sample the Ks own output by setting this to INT.

Mon: Set this to On. This will allow you to monitor what you're recording. Any signal coming into the K's analog input will go to the mix out and headphone jacks.

You will also see "L" and "R" indicators. These are record input meters. Check the level of your source before you start sampling because you won't be able to see these meters while the K is actually recording the sample.

Now we're ready to multisample our synth sound, and as I said earlier a short synth-bass sound will be fine for our purposes. This type of sound can be sampled without the need for looping, depending on how much RAM you



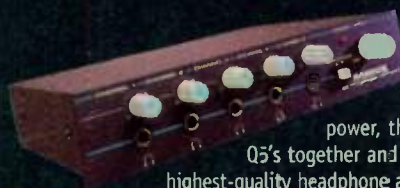
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- Balanced stereo outputs.
- 2 stereo effects returns to accommodate today's stereo processors.
- CD/tape input to bring in external signals.
- Peak output overload LEDs.
- 2 stereo aux sends.
- Headphone output.
- Mic and line input trim control 54 dB control range.
- AC power supply and optional battery powering.
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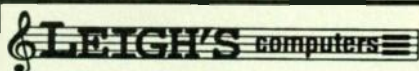


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TECHNIQUES PROGRAMMING

have in your unit. Let's assume that we're working with a 10 MB machine. Make sure you have made all your choices on the "SampleRecord" page.

1. Play the source sound at MIDDLE C to check how long it takes for the sound to decay. Check the same sound in a few other octaves and allow the sound to decay naturally each time you play it. This will help you determine how much sampling time will be enough. Now set the TIME control accordingly.

2. Set the THRESH control slightly above any noise that may be coming from the source synth. When sampling some older synths, you may need to set this to -78 dB to -60 dB. Use the GAIN control on the K and the output volume on the source synth to make sure you are not clipping.

3. Press RECORD. The unit will wait until a signal comes in louder than the setting of the THRESH control. Play the source sound at F2 and hold it down until the Kurzweil asks you to "Strike root key." Press F2 either on the Kurzweil or on the MIDI controller you have connected to it.

4. At this time, the Ks display will read "Save this sample?" Answer YES. The display will then read "Save New Sample" as the K finds the first empty memory location. Since we have started together, this should read 200.

5. Press Rename. Using the arrows and the data dial you will now be able to give your sound a new name. We'll call it TIPS BASS and press OK.

6. The Kurzweil will then ask "Save TIPS BASS as: ID# 200." Press the SAVE button and the K will flip back to the "SampleRecord" page. Now the "Samp:" section of the display should say 200*TIPS BASS-F2.

7. Turn the data dial one click and "Samp:" should read NONE. Press RECORD. Play the source sound at C3 (a fifth above our last sample). When the Kurzweil is finished sampling, it will ask

you if you want to save the sample. It will remember that we called the last sample TIPS BASS. It will also remember that you wrote the last sample to ID# 200, so it will ask if you want to save to ID# 201. Save your new sample.

8. Repeat steps 3-7 to collect all your samples of your source. Try multisampling at F2, C3, G3, D4, A4, E5, B5, and F#6. Multisampling like this helps to retain the integrity of the sounds which you'll hear when we arrange the samples into a KEYMAP.

SETTING UP A KEYMAP

From the "SampleRecord" page, get to the "EditKeyMap" page by pressing EXIT once. Press the button below the word "Assign." You can now select the sample to be placed into the KEYMAP. Use the Data Dial to call up 200*TIPS BASS-F2 and press OK. The Kurzweil will tell you to strike a "LOW" key followed by a "HIGH" key. Keep in mind that the top key should not be the same as the "LOW" key of the next sample. The next sample will start on C3, so our first sample should stop at B2. Once you have done this the Kurzweil will bring you back to the "EditKeyMap" page. Press "Assign" and dial up the next sample to be placed into our keymap — 201*TIPS BASS-C3. The LOW KEY for this will be C3 and HIGH KEY should be F#3 because your next sample will start on G3. Notice that you'll be repeating the first three operations for each of the samples.

When all of the samples are placed where you want them, press EXIT once and the Kurzweil will ask if you want to save this new KEYMAP. The name is probably still reading SILENCE, so press "Rename" and call our new KEYMAP "TIPS BASS." Press OK and the Kurzweil will find the first empty location for this new keymap. It should say "Save TIPS BASS as: ID# 200." Press OK and the unit will take you to the "Edit-Prog*KEYMAP" page. Pressing the "< more" or "more >" buttons will let you

KURZWEIL FACTS

Kurzweil K2000 and K2500 units that come from the factory with the sampling option already installed are equipped with 2 MB RAM. Serious sample-heads will definitely need to expand this. Two MB is not much, but it could be enough to get you started. The K2000 is expandable to hold up to 64 MB of RAM and the K2500 can be expanded to 128 MB. Both Ks are capable of playing back samples from Akai S900, S950, and S1000/1100, Ensoniq EPS, EPS-16, and ASR-10, and (of course) Kurzweil sample libraries. Both units can also read the Roland S-700 series sample libraries via SCSI interface. The Ks will also read AIFF and .WAV files.

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Studio Sound, April 1995



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TECHNIQUES

navigate through various functions in the Kurzweil. If you would like to add an effect to the keymap, press "more >" until you see a button labeled "EFFECT." Pressing "EFFECT" will bring you to the "EditProg: EFFECT" page where you can use the Data Dial to call up effect preset 10 (Chorus Slap in the K2000). Adjust the WET/DRY mix to your taste.

You are now ready to save this new program. Press EXIT once and the Kurzweil will ask if you want to save the program before exiting. The program name is probably reading "DEFAULT," so press "RENAME," title the new program "TIPS BASS," and hit OK. The display should now read "Save TIPS BASS as: ID#200." Press save and you will have now created a new program. It would be a smart idea to save this to disk now, so press DISK. For our purposes we will save to floppy, so make sure the display reads "CurrentDisk: Floppy" (if it doesn't, simply turn the Data Dial until it does). Next hit "SAVE." The display should now read "Save selection: 200 . . . 299*." The 200-299 section is where our samples are, so press OK. The display will now read "Save as: ." This is where you will name the file. You will only be allowed to use eight characters (all uppercase) and the file name must start with a letter. Let's call our file TIPS BASS. Press OK and the Kurzweil will tell you if it will be saving onto multiple floppies. This is why you will need to have the disks already formatted. When the disk drive stops writing your new samples and the program, you are finished.

Remember that a high-density floppy holds about 1.4, so a 10 MB sample will require nine or ten floppies. That's a whole box of disks, so if your budget allows you might want to buy a SCSI hard drive. I prefer removable media and have been using an 88 MB removable SyQuest rack-mount drive for about two years. While the Syquest works great, I always want more and can't wait for the 1 GB Iomega Jaz or SyQuest Drives.

Tony Di Lorenzo has been involved with synths and keyboards for the last 20 years as a programmer and sound designer. His company, Front Room Productions, has recently produced a CD-ROM for the Kurzweil K2000 and K2500 called "Producer Series Volume 1," available by calling 718-449-2129. You can e-mail Tony at: thefront@interport.net.

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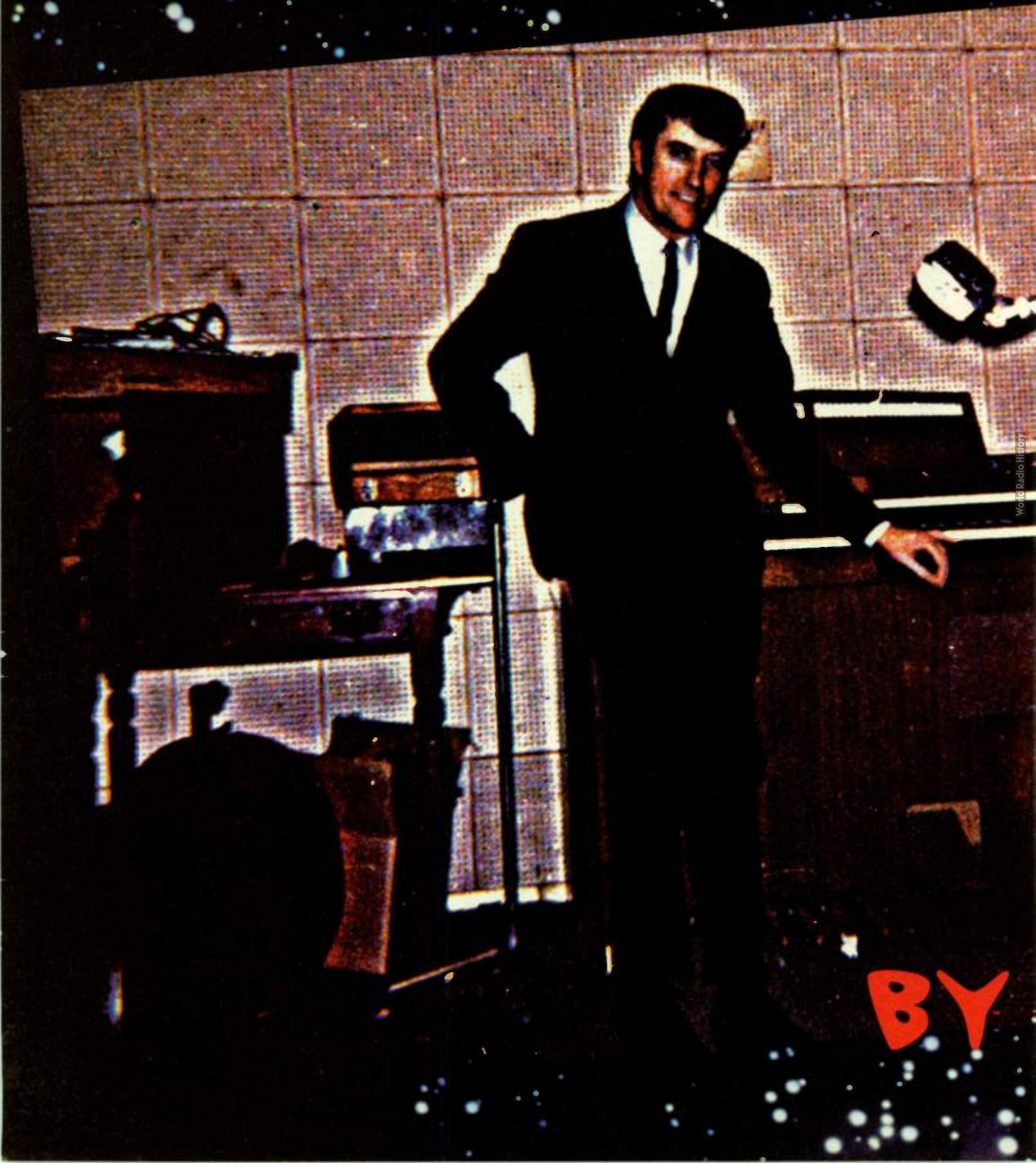
art of reference monitor loudspeakers, scurry to produce products to compete with Tannoy's original highly acclaimed and award-winning PBM series, **Tannoy moves on.**

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JOE MEEK

“They” say if you want something done right, do it yourself. We’ve heard it all before, but it’s true — and it goes double when it comes to recording. Have you ever lost the immediacy and intimacy of your home demo in some high-falutin’ studio at the behest of some bigshot engineer or producer? Don’t you hate when you’re told, “It can’t be done”?

That’s what “They” told Joe Meek, but he still managed to blast off with some of the most weirdly delightful and original records ever cut, and he told “They” where to get off.

If the name rings no immediate chime, here is the tale: Joe Meek is hailed as Britain’s first independent record producer, self-taught and later schooled in the arid ‘50s British pop studio scene where his revolutionary ideas and recording techniques turned heads and blasted VU meters. He went on to write, engineer, and produce a slew of diverse recordings earmarked by the use of echo, reverb, compression, limiting, and distortion — and featuring an assortment of outer space, macabre, and lighthearted rock ‘n’ roll themes, rendered with heavenly choirs, ethereal sounds, and a strong rhythm presence.

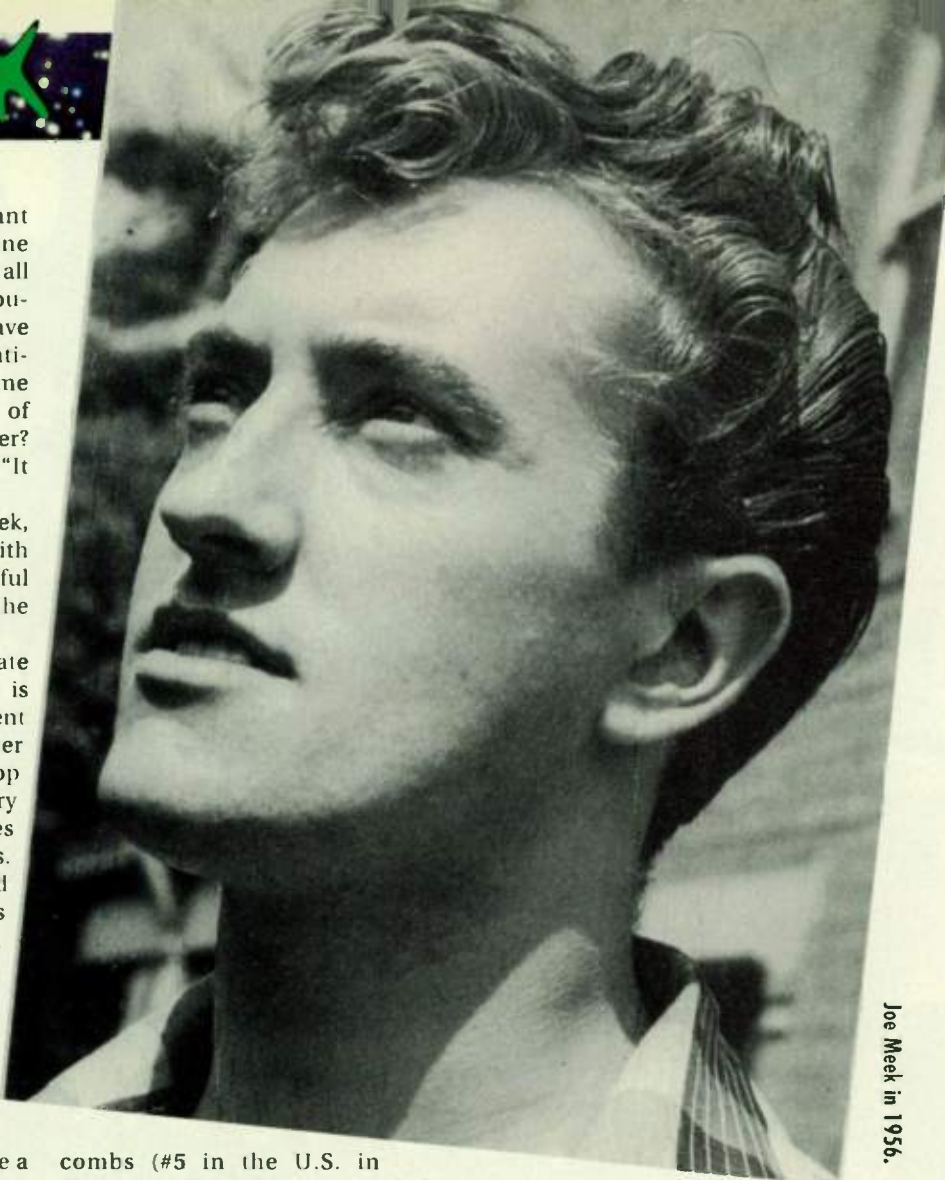
The artists he worked with were a mixed bag of body builders, actors, pop combos, pretty-boy crooners, female singers, talented instrumentalists, and screaming loons. His songs celebrated Buddy Holly, Eddie Cochran, big black coffins, life on the moon, country and western themes, burlights, and dearly departed loved ones. He racked up 45 top 50 chart records in the UK, but only two releases made noise in the U.S. — “Telstar” by the Tornados (the first single by an English group to break the U.S. top ten, let alone #1 on the pre-Beatles American charts) and “Have I the Right” by the Honey-

combs (#5 in the U.S. in 1964). And they all were recorded in a tiny apartment/studio in London!

If he was unable to create a certain sound he heard in his head, he’d simply invent and build the device to deliver it. Meek was a tone-deaf, dyslexic, husky workaholic who was obsessed with seances. He recorded Tom Jones’s first discs and rejected both the Beatles and Bowie, and some sanely and soberly call him a genius — the British Phil Spector some even say.

If Meek to you is a mystery, take heart: We will tell you more. No doubt “Telstar” will transport you back in time to a higher plane you may have since escaped. To hear these unusual sounds for yourself (and you should), Razor & Tie Records has done us all a large favor and released a far-reaching cross section of the meat of Meek with *It’s Hard to Believe It: The Amazing World of Joe Meek*, a CD compilation noteworthy to all “sound” people. So grab a listen and read on for a glimpse into the world of British recording circa 1953–67.

Dennis Diken is the drummer of The Smithereens, a card-carrying member of the Joe Meek Appreciation Society, and a compiler of prime CD collections including It’s Hard to Believe: The Amazing World of Joe Meek. Photos courtesy of the Joe Meek Appreciation Society (except where noted).



Joe Meek in 1956.

THE MAKING OF MEEK

Since age four, little Joe (born Robert George Meek on April 5, 1929 in Newent, Gloucestershire, England) was captivated by wires, scraps, castoff recorders, cameras, radios, and any tinkerable electronic junk he could drag into the garden shed. He effectively grew up teaching himself the art of recording and building and modifying the gear he needed from the inside out with a blinding dedication that led to the exclusion of other childhood interests.

He applied his building talents in imaginative and unusual ways. Birds were shooed away by loud blasts of music from speakers perched in the branches of trees in the family cherry orchards, while dumbfounded crabby neighbors were treated to instant replays of their surreptitiously recorded arguments! Through his formative years, he built crystal and TV sets, fiddled about with sound effects, overdubbing, tape editing, DJ’d at dances, and recorded local talent onto acetate discs.

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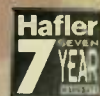
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CIRCLE 82 ON FREE INFO CARD
World Radio History

JOE MEEK

All of this practice led up to his service in the Royal Air Force as a RADAR technician. By 1953, he was ready for the big black smoke of London and the world of professional recording. The prestigious IBC Studios hired him: first for location recording of the Radio Luxembourg Shows, then as a sound balance engineer at their busy London facility during the heyday of skiffle and traditional jazz. Daily contact with the cream of British stardom (Petula Clark, Lonnie Donnegan, and Shirley Bassey, among others) and a wide range of musical styles schooled him intensely in the makings of a solid pop record.

There he also manned the boards on "Petite Fleur" by Chris Barber's Jazz Band (which later became a U.S. top 5 charter in '59), honed his production skills, and delivered a previously unheard prominent "upfront" drum sound on the Humphrey Lyttleton Band's "Bad Penny Blues" in 1956.

By the mid-'50s, the U.S. pop charts were waking from the doldrums of the earlier half of the decade's light-

weight pop dominance. Despite pervasive white "cover" versions of R&B hits, diverse and vital production camps (such as Sam Phillips in Memphis; Specialty in New Orleans; and Vee Jay and Chess in Chicago, to name but a few) could no longer be held down.

Concurrently, England's pop scene was a rather static affair. Most — if not all — releases suffered from a vanilla, hackneyed roomy sound that was void of any distinguishable production value. The bleedin' engineers were under orders to maintain a strict decorum of white lab coats at all ses-

sions, and tried-and-true recording "rules" were not to be questioned.

Of course, rules are made to be broken — and Joe Meek was just the chap for the job. With a "sound vision" in his head, he tore the front skin off the bass drum, put in a blanket for muffling and definition, and stuck a mic inside. Then he'd close mic the rest of the kit, isolate the individual instruments, chuck in the occasional sound effects (e.g., loose gravel shaken in a box approximated marching soldiers in "Lay Down Your Arms" by Anne Shelton), turn up the echo, and turn heads by actually *using* distortion. This was simply not acceptable behavior for the proper engineer and technician of the mid-'50s in Great Britain!

Joe was also a bit of a kook, and he alienated coworkers who found him increasingly difficult to deal with. In the blink of an eye he could transform from a giggly prankster into a vein-popping monster, hurling ashtrays, drumkits, or even compressors across the room at the slightest hint of constructive criticism.

As a producer, Joe used various methods of coaxing good performances out of his artists. Sometimes his gentle charming manner worked best, while on other occasions blatant threats



Working for Radio Luxembourg in '56.

Joe (seated on right) with Chris Williams & his Monsters at Holloway Rd. in 1960.



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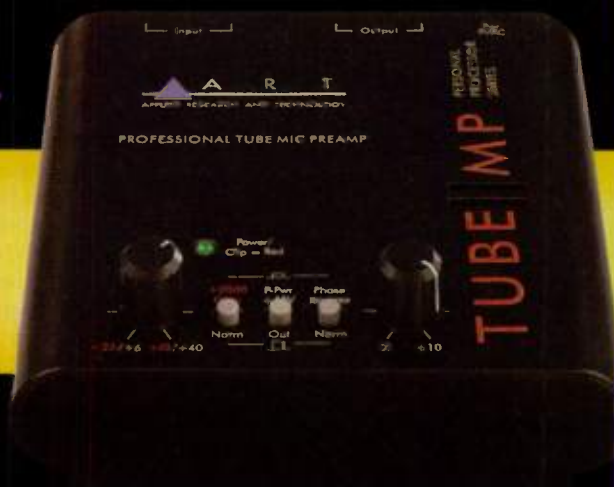
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JOE MEEK

"Manual vibrato can be achieved by wiggling the keyboard sub assembly from side to side. Where Moog added voltage-controlled filters to his synth, the clavoline has fixed imitative filters. It even has a built-in 15-watt tube amp in the carrying case/stand. Tailor made for a wiggy guy like Joe Meek."

For those of you curious about the album's sequel, *Part 2* remained in the can (aside from white-label test pressings and bootlegs) until ambitious Meek aficionados saw to the entire project's CD issue in England in 1991. The odd music was performed by a transmuted skiffle group christened The Blue Men, and featured sped up "creature voices" (à la Alvin & the Chipmunks), gimmicky stereo separation, and Joe's beloved trademark sound effects.

INHERITING THE EARTH

In addition to his engineering talents, Joe also helped design and build one of England's most enduring state-of-the-art studios. Lansdowne came to be known as "The House of Shattering Glass" in tribute to the clarity and quality of its recordings. Some former IBC clients defected to the new digs to work with Joe again as he honed his skills and produced more hits.

Bolstered by the success and royalties of his composition "Put a Ring On Her Finger" by Les Paul and Mary Ford (U.S.) and Tommy Steele (UK), Meek cultivated a stable of artists and became partners in Triumph Records. Pitching a good fight against the powerful British majors, he scored a top 10 hit with "Angela Jones" by Michael Cox in May of 1960 before the tiny independent succumbed to smothering distribution problems. But the real fun was about to begin...

Major Banks, Joe's Triumph partner, bankrolled a new operation that gave Meek his own studio and complete creative control in the production of masters to be leased to the British majors (Decca, Pye, EMI). This new empire was christened RGM Sound (after Robert George Meek).

One might expect a visionary like

Meek to chart his world domination in a cavernous studio with great natural room reverb and space to accommodate the array of musicians required to give life to his lofty, stomping, celestial sounds of the cosmos. But Joe knew the true merit of project recording decades before the term was coined: He built his studio in a small, three-floor apartment dwelling above a leather goods shop on London's busy Holloway Road.

Here's the layout of the joint: The first three floors housed a tiny waiting room, an office, a kitchenette, and a 15' x 11' (approx.) living room. The second floor had a small bathroom, an 11' x 11' x 10' control room, and a main studio room (17' 8" x 13' 6"). The third floor held the bedroom, a spare bed/storage room, and an additional junk room.

TELSTAR TALES

It was at 304 Holloway that Joe recorded his most well-known work — the Tornados' "Telstar." By today's modern communications standards, the quality of the original fuzzy Telstar satellite trans-

missions of July 1962 is prehistoric in comparison, but the specter of the then-new technology and the spacey implications gave Joe the jolt he needed to blaze into the creation of his most legendary work. When the Tornados cut the basic track before driving to their evening gig, they had no clue as to what Joe and Geoff Goddard (his writing partner) would deliver on the final product of "Telstar." When unleashed, this astounding production presented a total sound picture unheard of before or since.

A book could be written about this disc alone, but confining this masterpiece to the printed word would be like "dancing about architecture," as Jake Riviera once said. But how about the guitar breaks? Jeff Lynne has said, "I've always dreamed about getting as good a sound as that...That is the ultimate sound of an echoey guitar. It's like Heaven to me, that bit." For the record, Alan Caddy of the Tornados played a Gibson ES 335 TD Blond through a small Vox AC 15 on the session.



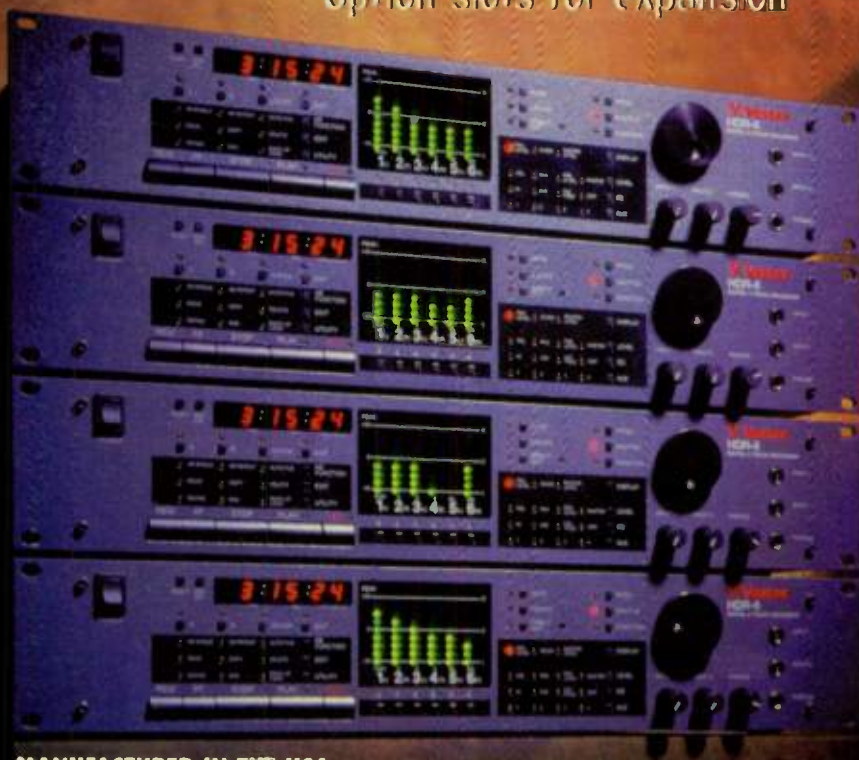
Meek at 304 Holloway. Photo courtesy of the Hulton Deutsch Collection.

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JOE MEEK

built by the technical staff to their own requirements — usually very different requirements to Joe's!"

Eventually, Joe upgraded to the EMI BTR/2, a popular and standard-setting recorder in Britain. For a technical look, we once again turn to Ken Brown, who calls the bulky machine, "technically luxurious. Overkill in every respect. In this pre quartz-locked, servo-control era, tape drive meant huge precision motors driving an enormous but beautifully engineered tape deck. Mechanical engineering at its very best, complemented by 'conservative' circuitry, heavily underrated for stability and reliability. The steel cabinet (specially made for EMI by Morris Motors) housed the tape deck in the top, and amplifiers, power units, and oscillators behind two doors below. It had 3 heads, 11-inch reels, and two speeds (15/30 ips) if it was the high-speed model.

"Despite its size, the BTR was totally silent in operation, controls operated with a cushioned, sensual 'cl-o-o-mp' with air-damped tape retractors, and three reservoirs on the tape deck that had to be topped up with oil for the lubrication system!"

He soon ran this in conjunction with the Ampex 300 IC (console) recorder. According to Brown, compared to the BTR, this less cumbersome unit "was slightly more modern, featured better heads, and had a really warm 'American' sound to it. With a few changes, the original 'three-ton' deck would still be around for a couple of decades through the 300, 350, 351, and 440 series machines progressing from mono up to 8-track. Joe's Ampex/BTR combination, both running full track and hopefully at 15/30 ips, would have boosted his overdubbing capacity tremendously.

"Instead of hopping from the questionable TR 50 to a mere 1/2-track on the Lyrec and back again, he now had two full-blown, high-speed, full-trackers do the job. They were both 3-head machines, offering splendid off-tape effects, and he would save noise by not having to go down to 1/2-track on every Lyrec bounce, and reduce wow and flutter by avoiding several degradations on the TR 50. He could now bounce a completely finished rhythm track onto the Lyrec once only,

leaving the other track free for vocal or lead instrument as he wished.

"This new freedom could also be turned around for other effects. He could, for instance, record a split mix live onto both tracks of the Lyrec, equalize, echo, and compress each separately, then bounce them onto mono onto the BTR or Ampex, then back to one Lyrec track with something new added...and all this via his ultraflexible 'free access' mixing network, including effects inserted wherever. The permutations were endless. Technically, it

meant the maximum utilization of the minimum components, which, in engineering terms, means efficiency."

SPECIAL EFFECTS

Meek cut with his levels as hot as possible and utilized distortion when it fit his "needs." He saturated the tape with as much signal as it could withstand. Brown assures us that Joe monitored full tilt, as well: "Quad preamps feeding Quad 11 power amps driving 15-inch



Meek in his control room ('66).

MASTERING MEEK

As dense and hot as the Meek singles sounded, it's possible that CD reissues of his work give a more realistic rendering of what he had intended for the end product. John O'Kill discusses the mastering process in *Thunderbolt*:

"Although we all loved and enjoyed our vinyl records in the '60s, the truth is it was often a monumental struggle to get the disc 'cut' to equal the master tape when the tape was finally transferred to disc. I suspect that much of the distortion for which Joe was so often accused was not there in his tapes, but occurred because of the inability of cutter heads of the day to handle his 'over the top' productions and carve them for all time onto a revolving disc of cellulose acetate.

"The '60s setup [for mastering was] a Scully lathe fitted with a dubious Westex cutter head, driven by a Leak TL 10 10-watt amplifier, cutting into a disc of cellulose acetate, which would still undergo endless generations of electroplating until the final stamper was mounted in the record-pressing machine. CDs cut from original tapes or good copies reveal like never before how brilliant some of Joe's recordings were."

Tell that to the Decca engineers of '62, who, upon monitoring the master tape of "Telstar," were "horrified at its unheard of levels of limiting and compression." Or to the dim bulb in the sales department who thought the record was scratched at the beginning!

—Dennis Diken

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JOE MEEK

Tannoy dual-concentric 'Reds' in Lockwood cabinets. Definitely not a set-up for anyone of a nervous disposition!"

Joe probably moved up to 4-track sometime in the '60s as evidenced by some later Honeycombs recordings that were issued in stereo. Ah, but Meek's masterworks shine for their monophonic majesty and unique quality that only his bouncing and individual source compression could conjure.

Some cuts ooze an inherent essence not unlike many 4-track bounced home demos we've all had experience with. Certain individually dubbed sounds fall into an eerie, surreal, almost out-of-place setting. Where Joe was concerned some of these moments may have been intentionally placed; the fuzz guitar lick following the verse lines on "I Take It That We're Through" by the Riot Squad being one example.

Brown also notes that in March of '63, Joe "added two Altec compressors, a 436A and a 436B, to his arsenal, together with a new tone control unit, and a 220/110-volt step-down transformer to power them all." Later, in September of that year he brought in a Fairchild Dynalizer 673, limiters 660 and 661, and a compact compressor 663.

Joe's mic selection included some Neumann condensers, Telefunken's, and the Westrex Ribbon, a piece not found in many British studios but no doubt appealing to Meek, as it was seen in some photos from Buddy Holly vocal sessions. (Meek was a rabid Buddy Holly fan.) He also employed the ribbon Reslo RBT, used for the bass drum and occasional group vocals.

John O'Kill's article, "The Technical Joe Meek, Pt. 2" (also published in *Thunderbolt*), states that these types of mics "pick up equally from the front and rear, not the sides. Obviously, vibrating the ribbon by singing into the front will give an electrical output 180 degrees out-of-phase to that obtained by singing into the back. With a soloist, this is of no significance, but quite a lot of phase cancellation occurs when you have both front and back simultaneously. The effect can be very useful — a bit like 'free' compression, helping to contain complicated backings, and providing a curious sort of solo boost should the front or rear party pause while their colleagues opposite continue."

Play a Joe Meek-produced record and you will hear echo and/or reverb. A

continued on page 112

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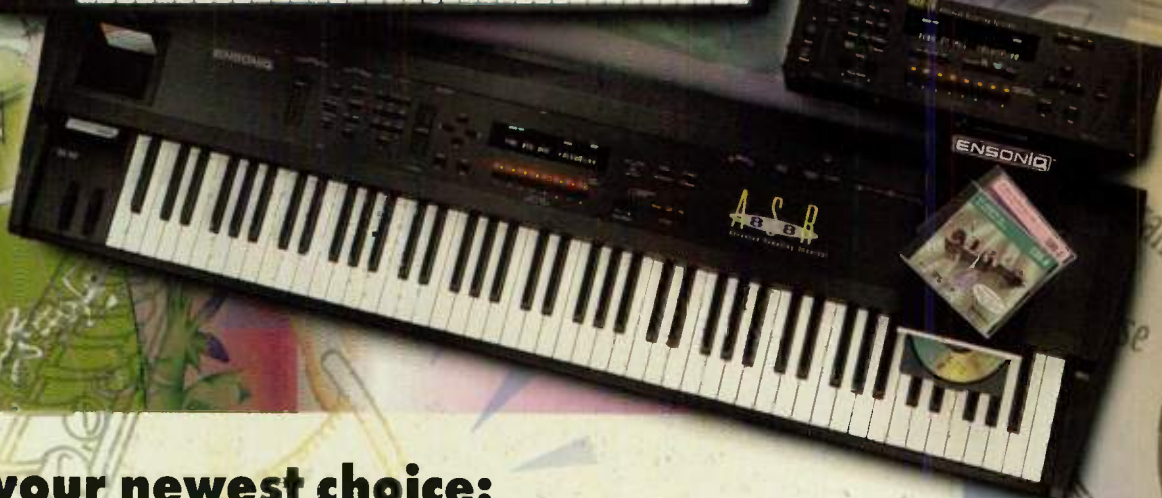
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It's the holiday season once again. And we all know what that means: move the socks with the guitars printed on them that you received last year to the back of your drawer so you can make way for the G-clef studded socks you will receive this year. Don't worry, though — this year will be different and *EQ* is going to help.

Compiled here is a sampling of products that any engineer will be happy to find in his or her stocking. The prices range from downright cheap all the way up to somewhat reasonable. (If they're going to drop a few grand on you, your personal opinion should be sought.) We recommend that you highlight the products that interest you and then subtly leave the magazine open to these pages in a place your loved ones will be sure to find it (the front of the fridge springs to mind...).

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Tech the Halls

GROOVY TUBES & THINGS

If you are into tubes, then the ART Tube MP should be at the top of your wish list. The portable Tube MP is a single-channel mic preamp/DI that uses a 12AX7 tube to throw a little warmth into the occasion. It has 70 dB of gain, and is well-endowed on the feature front, with balanced XLR and unbalanced 1/4-inch inputs and outputs, a phase reversal switch, and phantom power. The Tube MP's best feature, however, is the price: \$149 retail. Hey, for that price there's enough money left over to still buy a pair of musical socks. Call ART at 716-436-2720 for more information.

Speaking of DIs that are good buys, there's also the Countryman Associates Type 85. The Type 85 is a roadworthy FET direct box that can withstand substantial abuse and still provide clean sound. It can run on phantom power or can be used with an internal 9-volt battery and be purchased for a street price of \$149. For more facts, contact Countryman Associates at 415-364-9988.

Next on our holiday hit list is the MIDIMAN MacMan Interface. Macintosh users will love this device, which is a one in/three out Mac/MIDI interface that needs no external power. It has LEDs for monitoring activity and a serial port output, so you can leave your printer or modem connected. The street price for the MacMan is \$70. Windows users need not apply, but they can check out the MIDIMAN PORTMAN for PCs which retails for \$179.95. Call MIDIMAN at 818-449-8838 for more information.

And while we're delving into the computer world, why not improve your storage situation with Iomega's Zip drive. For a measly \$200, you get an impressive little drive that includes a 100 MB disk. Additional disks are available for about \$20 (\$15 if you buy in bulk). The drive is small enough to travel, and offers a decent transfer rate of between 0.79–1.40 MB/second. If you want proof of the Zip's musical chops, just ask Roland, the distributor of the

Zip drive. For more details, call Iomega at 800-MY-STUFF. (You can also check out our First Look in the October issue.)

BACK TO BASICS

In the more conventional world of recording, there are quite a few solid pieces of gear that'll help the gift recipient get the job done. For example, at a street price of around \$135, you can pick up the Sennheiser MD504 microphone. It's a very rugged dynamic mic that's good for drums, guitar amps and horns. Its biggest pluses are that it can fit into tight spots and can also take a good whack with a drumstick. Call Sennheiser



Iomega's Zip drive

at 203-434-9190 for more details.

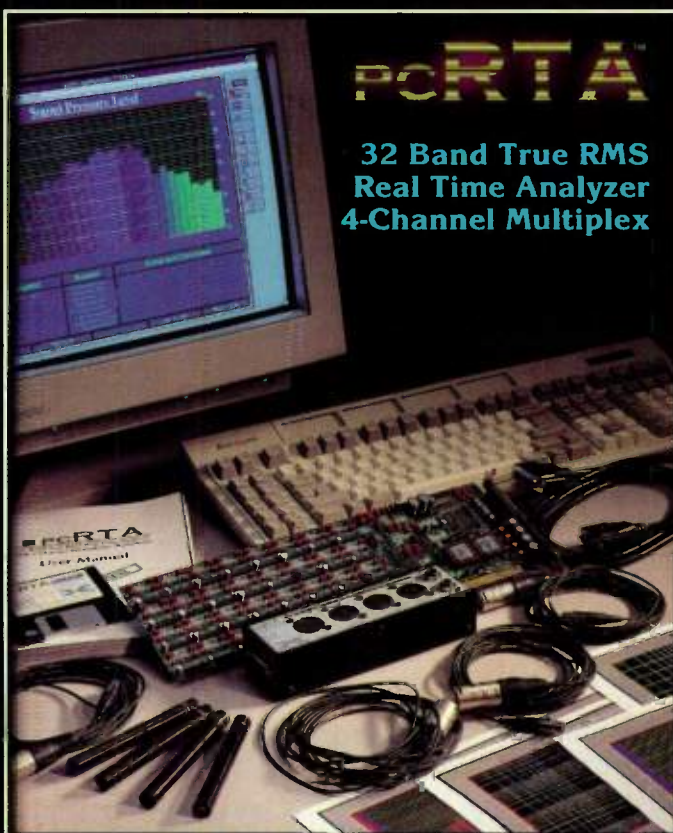
Now that you've given them a new mic, they will (of course) need another mic stand. But why not give something a little different? In particular, how about a "low boy" model like the A/343 from Quik-Lok (about \$40 on the street). This extra-short stand makes miking kick drums a lot easier than a normal height stand and has an extra-heavy base to prevent tipping. Contact Quik-Lok at 800-431-6699.

And to hear all those good sounds they'll be capturing with the MD504, give a pair of AKG's K141M headphones. At a street price of about \$80, these reliable reference 'phones are a bargain. They are good for live gigs or in-studio sessions, and you can borrow them for listening to your favorite CDs. Call AKG at 818-830-8278 for more details.

TOOLS OF THE TRADE

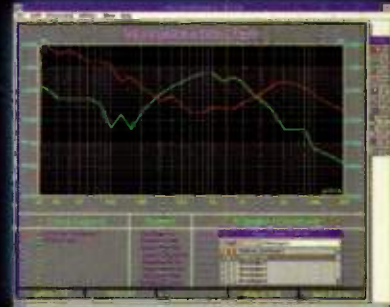
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Tech the Halls

guitarist forgotten his tuner? Take matters into your own hands and get your sessions rolling with Korg's DTR-2 digital tuner. For \$159 (street price), this rackmount device has a large, easy-to-read LED meter that everyone can see. Get more details by calling Korg at 516-333-9100.

And speaking of things that'll make studio and gigging life a little easier, the Whirlwind cable tester can certainly save some aggravation. Take this little tool with you wherever you go and eliminate the guessing game that arises when problems occur. This DI-sized tester checks RCA, XLR, and 1/4-inch phone cables for shorts, opens, and phase. A street price of \$54.95 will put one of these devices under your tree. Call Whirlwind at 716-663-8820 for the full story.

STOCKING STUFFERS

As far as stocking stuffers go, batteries,

cables, CDs, and guitar picks are all well and fine, but what about ear plugs? Ears are undoubtedly the engineer's best tool, so show them you care this season [obligatory holiday guilt phrase] with the gift of ear plugs. In fact, at \$.50 a pop, get them for everyone in the studio so the object of your affection doesn't feel self-conscious about bits of foam protruding from his or her ears. And do use the foam variety, preferably with an SPL attenuation factor of around 20 dB.

For the touring sound engineer, other cool stuffers include Neutrik Solderless Connectors (we think the name says it all) and the Mini Mag-Lite flashlight that are now available in a bunch of cool colors (check out the metallic red). The Mag-Lite is available in a gift package that comes with a belt holster and batteries for around \$15 at most hardware stores.

GRATUITOUS PLUGS

Because it's obvious, we didn't mention what a great gift a subscription to *EQ* is. It can only be topped by giving *EQ on CD*. And we'd also like to mention that the editors are accepting gifts this season. Ho Ho Ho... **EQ**



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NEW PRODUCTS
PAGE 88

HOLY WATER:



POPE JOHN PAUL II ON TOUR

THE POPE VISITS AMERICA



IT TAKES MORE THAN A DOWNPOUR TO KEEP THE PONTIFF FROM TAKING THE STAGE AT NEW JERSEY'S GIANTS STADIUM

BY DAVID SCHEIRMAN

WHAT DO THE Pope and the Grateful Dead have in common? For one thing, both have played Giants Stadium. In fact, my company, Concert Sound Consultants accompanied Diocesan representatives to Grateful Dead and Genesis concerts at Giants Stadium so they could observe concert production techniques and hear the venue's acoustics.

As sound director for some of the recent events when Pope John Paul II made appearances in the greater New York area during October, 1995, I was privileged to work directly with the Archdiocese of Newark, NJ and Vatican representatives on sound sys-

tem needs and operations for the Holy Father's visit.

For 83,000 people in Giants Stadium on October 5, seeing and hearing the Holy Father was very important. That could only happen if a tightly coordinated team of more than 20 engineers and technicians worked together to supply live and broadcast audio for multiple music groups, an orchestra, a 400-voice choir, and the Pope...during a driving rainstorm in a huge sports venue.

PRE-EVENT CHALLENGE

The event, originally planned for fall of 1994, had a very clear mandate attached to it from the Vatican and the Archdiocese of

Newark: "All attendees must hear clearly, and don't block any seats!"

The sound system design process included a review of different ways to position loudspeakers to meet the above goals. A fully distributed system, with perhaps 250 compact speakers on metal poles might work — so might two massive scaffolding towers flanking the altar, like a huge pair of rock-concert arrays.

Neither plan could serve the Holy Father's visit to Giants Stadium. A week's time and the labor to wire, install, and test hundreds of tiny speakers was just as implausible, as was blocking 20 percent of the available seating sightlines with huge scaffolding towers.

The early planning stage to address these and

other issues included a series of meetings with the Papal Task Force and conferences with architects, conductors, network TV producers, heavy-equipment rental firms, and the Secret Service.

Before deciding on the exact system layout, we performed advance acoustical testing in the empty stadium. Coverage angles and sound pressure levels were measured and recorded using test speaker units. A computer-aided design program was used to produce 3D modeling drawings of the stadium, and different speaker placements and the anticipated results were modeled.

The primary system design that we settled on used eight Sky-Trak industrial telescopic lifts, able to suspend thousands of

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RECORDING IN THE RAIN

Singing in the rain? Four hundred voices, an orchestra, a handbell choir, and Pope John Paul II? Archival recording? You can't exactly say, "no problem," but it can be done.

The Archdiocese of Newark, while focused on live sound reinforcement for the event, requested that a live recording be made of the proceedings.

Rather than involve a dedicated recordist, separate mixing consoles, or a remote truck just to get archival material, the setup used a dedicated stereo mix bus feed from the primary sound-reinforcement console (a Yamaha PM4000-40).

Since all feeds from the output matrix section were dedicated to driving the main loudspeaker zones, the board's main left and right outputs were assigned to feed a Panasonic SV-3700 DAT recorder. This enabled a full postfader mix of choral, instrumental, and public address mic signals to be easily recorded.

With inclement weather almost certain, the microphone selection was confined to dynamic mics with few exceptions — lots of Shure SM58's (48-volt phantom power and rain don't mix well). All mics were fitted with foam windscreens. Shockmounts were

applied where appropriate. Compact plastic sandwich bags were ready to set over each mic/windscreen combination that was exposed to rain from above.

A select group of strong soprano, alto, tenor, and bass voices in the choir were clustered around a group of four condenser mics (Shure SM87's) for a brighter, tighter sound than was available from the dozens of other area mics in the large choral ensemble area.

Prefader listen (PFL) functions were assignable to compact, self-powered Anchor-brand loudspeaker units positioned near the main mixing console. A pair of stereo Sony headphones driven by a Crown D-60 amplifier monitored the stereo mix going to tape on the Panasonic DAT player. Once the record level was set during the earliest few minutes of the preliturgical music, the archival tape feed was basically "set and forget it."

Meanwhile, a battery-powered Nagra tape recorder fielded by a pair of engineers from the Vatican showed up on the mix riser at the last minute. A prearranged duplicate record feed was plugged into their machine with XLR lines, level was set with oscillator tone, and the sound of the event was also captured for the permanent files in Rome.

—David Scheirman

pounds of loudspeakers up to 42 feet off the ground, while properly angled to cover Giants Stadium's far-flung reaches. Each orange lift unit was precisely positioned on the field and then covered with potted plants.

AUDIO RESOURCES

After a specification and bid process that included prequalification checks with major sound rental companies throughout the United States, the system rental contract was awarded to Andrews Audio of New York City. The firm's inventory of Meyer MSL-10's, a large-scale integrated speaker enclosure intended for use at mega-events, was ideally suited for implementing our system design. Crown amplifiers were racked and designated to drive Meyer loudspeakers in different parts of the stadium. A pair of Yamaha PM-4000 40-channel mixing consoles was chosen to handle front-of-house chores. A Ramsa WSR-52 allowed Concert Sound Consultants' engineer Dave Revel control over music-area inputs and speaker zones.

With 22 separate loud-

speaker zones throughout the stadium requiring precision parametric equalization and signal delay adjustments, we elected to specify a computer-aided audio measurement system. Meyer Sound's Bob McCarthy was brought onboard to pilot the S.I.M. (Source Independent Measurement) computer for the project.

The system design included a total of 12 Meyer MSL-10's, 32 MSL-3's, and more than 50 other various speaker enclosures placed near ground level by the altar, on poles behind the choir and altar area, on platforms in entry portals, and other locations.

Sixty-six microphones, eight direct boxes, a 12-station intercom system, and thousands of feet of cabling rounded out the system. Input signals ranged from audio-for-video playback and a large four-manual Allen organ to acoustic guitars, flutes, French horns, and percussion instruments. The renowned Metuchen Festival Chorale made up the core of a 400-voice choir, drawn from dozens of different parishes throughout the

Archdiocese of Newark.

An ornate, red and white altar area was erected with an elevator lift for the Holy Father, and custom-made chairs for the Bishop, Cardinals, and other worship leaders. A clever, visually pleasing canopy structure provided a place for lighting instrument fixtures and weather protection for the altar area.

ENVIRONMENTAL FACTORS

Mixing a 400-voice choir in the driving rain is not easy. Let me state that right up front. Neither is jockeying for vocal clarity in a 15-knot wind. An event of this scale, planned to take place rain or shine, requires a certain flexibility on the part of sound technicians and engineers. Cover the speakers with plastic, or uncover them? Leave the mics up, or strike them? Lay the cable now, or wait for the guys with the pushbrooms to clear the puddles?

While the mix booth had been carefully designed to protect the sound-mixing equipment, other parts of the stadium area were drenched. Despite windscreens and even plastic bags, vocal clari-

ty was preserved and choral and orchestral music was able to be presented to the capacity crowd.

The extreme weather, while causing Secret Service agents to raise the trench coat collars, did not stop the event. Canopies and banners flapped in the wind. Thousands of people huddled in groups.

By mid-afternoon, the crowd was too wet to care. More than 80,000 souls received communion during a major 20-minute process that included hundreds of priests working in close coordination.

The meticulous planning process, a talented audio team, and a bit of luck rewarded our efforts.

Special thanks to: Mr. Michael Ahern, M.A.P.S. Inc.; Bob McCarthy, Meyer Sound Laboratories; Mr. John Fohnestock, Production Arts.

David Scheirman is the owner of Concert Sound Consultants. The company specializes in system designs and onsite engineering teams for special events worldwide, and can be reached by fax at 206-780-5775.

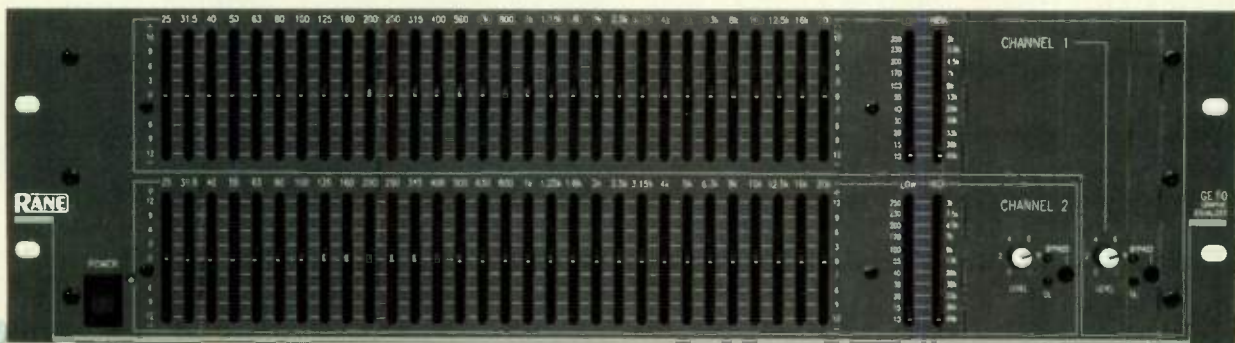
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FIRST LOOK: QSC POWERLIGHT 4.0

THE LATEST ADDITION to the PowerLight Series of amplifiers from QSC Audio Products, the PowerLight 4.0 (\$2998), is the largest amp in that series (rated at 1400 watts per channel into four ohms) and the most powerful amplifier that QSC has built to date. In spite of its high power output, the PowerLight 4.0 lives in a chassis that is three rack spaces high and weighs in at only 30 pounds. But beyond the serious muscle contained within the 4.0, there is an intelligence of design that can be taken advantage of by both touring sound reinforcement companies and club-size PA operators.

An amplifier with this kind of power should be properly connected, and QSC helps this by screening the rear-panel Neutrik Combo jacks with the XLR pinout (pin two hot, like it's supposed to be). Barrier strip input terminals are also present, and speaker outputs are on dual binding posts. The 4.0 can be operated in either parallel, bridged, or stereo modes and a three-position switch on the back panel selects which of these modes is active. The binding post outputs are "touch proof," and, at these kinds of power levels, this is a good idea — you don't want to be accidentally holding the posts of an amplifier that can deliver two kilowatts. The



posts will accept a dual-banana plug for either stereo or bridged-mono output and the panel is clearly labeled with which of the red posts is "hot" during bridged operation.

The PowerLight 4.0 features QSC's exclusive PowerWave Switching Technology. PowerWave Technology allows the 4.0 to run at an AC mains voltage as low as 90 volts with no audible effects on amplifier performance. The capacitors in this power supply charge roughly 230,000 times per second (much faster than a conventional power supply), which means that when high-power, low-frequency audio signals hit the input, the PowerLight 4.0 is fast enough to deliver power to your speakers without running out of gas.

On the rear panel of the 4.0 are a pair of terminals marked "Power Supply Control." Shorting these two terminals together (perhaps with a latching switch) puts the amp in standby mode.

The front-panel standby LED will light, and the amp draws only a small amount of current from the AC mains. Opening the circuit between these terminals turns the power supply (and amplifier) on once again. While in standby, the caps in the power supply remain charged, so there is no inrush of current when the

channels of continuous monitoring for input and output signal levels, amplifier temperature, power status, and presence of opens or shorts. If a problem is detected, the CM16 routes the 4.0's current and voltage signals to a DSP for real-time impedance analysis. If that is not enough, you can add the MSP AD8 Audio Drive Processor that

QSC MANAGES TO PACK PLENTY INTO ITS MOST POWERFUL AMP TO DATE

BY STEVE LA CERRA

amp turns back on. This control circuit can easily be daisy-chained to control multiple PowerLight amps.

The one unusual connector on the rear of the PowerLight 4.0 is an HD-15 instrumentation interface that allows the amp to communicate with QSC's Multi-Signal Processors, or MSPs. The MSPs (controlled via PC) can perform various functions in a multiamp audio system. The MSP CM16 provides 16

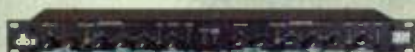
(via 20-bit A/Ds, D/As and 24-bit DSP) can apply metering, polarity reverse, delay, parametric EQ, crossover, attenuation, and peak limiting to eight PowerLight 4.0 units (the MSP SD8/16 combines the functions of both units in one package).

By introducing the PowerLight 4.0, QSC has created the lightest amplifier in the industry capable of producing this level of power. But they have also created an amplifier with truly useful features for both touring and club-type PA systems. The 4.0 is a building block in a sound system that is destined to expand.

For more information, contact QSC at 1675 MacArthur Blvd., Costa Mesa CA. 92626-1468. Tel: 714-754-6175. Circle EQ free lit. #124.



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FIRST LOOK: SOUNDCRAFT BROADWAY

TAKE A CLOSER LOOK AT THIS BOARD THAT TELLS OF THINGS TO COME IN LIVE SOUND

BY STEVE LA CERRA

WITH THE introduction of the Broadway, Soundcraft steps into some rather unusual territory even in this age of modern console design. Yes, the Broadway offers a digital control surface like some other consoles, but the signal path in the Broadway system remains in the analog domain at all times — not a single A/D audio converter to be found! The Broadway console surface is almost like a huge remote controller for its audio interface system, which is housed in a pair of racks.

Geared for use in theaters, a Broadway console can be small enough not to take up a lot of "seatage" and yet still address up to 100 or more input channels. Among the Broadway's powerful features are expandability, complete snapshot recall and reset of every audio function in the system (within about one second), and user-assignment of 32 balanced audio output busses to per-

form just about any function one might desire. The number of cues that can be stored is limited only by hard-drive space (a 250 MB drive is included), and each cue can also recall signal routing and custom control layout for each scene.

Unlike the typical audio console, the Broadway system consists of several components: an Input Control Surface, a Master Control Surface (one per system), a 40-input audio rack (multiple input racks may be used within a system), and the master/output audio rack. While most of the audio interfacing is at the racks, MIDI in/out/thru and computer network connections are present on all audio racks and all control surfaces. The Master Control Surface panel also offers a parallel port, time-code in/out, RS232 port, and video sync input. Three PFL audio busses appear on both the Master Control

Surface and the master audio rack. The audio racks come standard with 1/4-inch and XLR connectors, but due to their modular design, they can be custom-configured for other types of connectors if the user desires. The racks interconnect via balanced multipair cable and connect to the console via dual-coaxial digital network connectors. The I/O racks are designed to be placed nearby the signal source (i.e., near the stage) thus keeping the analog signal path short and clean. This allows the console work surface to be located just about anywhere and only requires the two coax cables to be run the length of distance between console and stage.

The heart of the Broadway's operation is the system's control surfaces. Console real estate is divided into input, group, and master sections, much like a "normal" console, but an unlimited number of input control surfaces may be added to a Broadway system. Each of the 20 channels in one Input Control Surface contains a 100 mm

motorized fader, six assignable rotary encoder controls, mute, solo and select switches, and several status indicators. Unlike most consoles, the control knobs on the input channels are completely assignable — any rotary control can be assigned to any function such as send level or frequency sweep select. This assignment is global to the input channels on a single Input Surface, so if you select the top rotary knob as send 1, then the top rotary on every channel controls that same function.

Eight BANK switches on the Input Control Surface enable the user to control any of 160 channels (eight banks of 20) from the single Surface. Any function of a particular row may be locked out by the systems engineer to prevent overzealous visiting engineers from reconfiguring the system. Near the monitor level fader are controls for solo, mute, and "select," as well as an LED showing the primary VCA being controlled by that channel. If more than one VCA is assigned to the same channel, the display shows



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the lowest-number VCA and a red dot appears in the bottom-right corner of this display. Channels (as well as sends and groups) may be named using a four-character dot matrix display for each fader. Primary metering for each channel is displayed on an LED ladder next to the fader, which indicates signal levels from -50 dB to +15 dB.

While the solo and

mute controls are self-explanatory, the "SEL" (select) switch deserves some explanation. This switch assigns a channel to the Broadway's ACS, or Assignable Channel Strip. The ACS controls one channel at a time and offers the user the ability to control most of the channel functions simultaneously, including the 4-band, fully-

parametric EQ, low- and high-frequency filters, gain, mic/line select, and pan. This last one is important, since there is no dedicated pan control on the channel. The ACS also makes the 32 (plus five master) busses available to the mixer; although they are accessible 16 at a time, all 32 are active at all times.

Instead of giving you

predefined auxiliary and group sections, the Broadway provides "graux" (group/aux) busses. The rear panel of the master audio rack has 32 graux output connectors to be configured by the engineer as effect sends, foldback mixes, or subgroups, depending on the application. The graux masters use 16 rotary and 16 linear controls (swappable), all located on the Master Control Surface. Each master has a four character LED display for labeling as well as controls for mute, solo, and a "func" (function). This last control is an on/off toggle for the current function selected in the graux section. For example, when INS is the chosen function, the FUNC button places the insert send and return in or out of the signal path for that particular graux.

Also located in the master section are four master output faders for main outputs 1, 2, 3, and 4/5, which are paired to facilitate stereo surround level setting (an offset in level may be entered if necessary). Remember those six rotary encoders on the Input Control Surface? Well, the master section has eight user-definable (and four factory preset) control assignment buttons that allow storage of eight arrangements for those encoders. You could program control assignment one for EQ on all six rotaries and then, by simply pressing control assignment two, all of the encoders could change to auxiliaries 1-6 or whatever. The Master Control Surface also provides eight "hot" cue preset buttons that can be used to quickly execute an audio scene change.

The Master Control Surface is rounded out with a touchscreen that provides access to all of the software pages not available via surface control. Generally, the touchscreen will be used for system configuration, diag-

continued on page 129

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It's so easy to take a digital multitrack recorder out on the road. But teaming it up with a compact, affordable mixer that's up to the job of making studio quality live digital recordings direct to tape is not so easy.

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- Balanced Tape Send/Return, switchable between +4dBu and -10dBV
- Separate pre-fade Insert and Return sockets, eliminating Y-cables
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SPIRIT
By Soundcraft

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NEW GEAR FOR YOUR NEXT GIG

A GEM OF A SYSTEM

Bag End Loudspeaker Systems recently announced the introduction of the Sapphire, its all-new, Time-Aligned, high-output loudspeaker system. Designed with an array of applications in mind, the Sapphire includes built-in flying hardware, a built-in stand adapter, and an angle-cut wedge shape. The Sapphire is loaded with a 3-inch compression driver with a 40 x 50-degree high-frequency wave guide horn and single 12-inch high-efficiency cone driver for both high output and high fidelity in a compact enclosure. For more information, contact Bag End P.O. Box 488, Barrington, IL 60011. Tel: 708-382-4550. Circle EQ free lit. #125.

RACK 'EM UP

api's L200 modular rack system has been designed for use in FOH PA systems, as well as in subtle acoustic environments. New all-discrete modules include the 205L direct box, 212L mic pre, 215L sweepable filter, 255L line driver, 265L single-channel mixer, and the 275L stereo master. Also available is

the 225L compressor and 235L noise gate. Customize your own processor with api's available modules. The L200 rack system is a compact 2U 12-slot rack that can be easily transported and set up for different projects and gigs. For further information, contact api, 7655-G Fullerton Road, VA 22153. Tel: 703-455-8188. Circle EQ free lit. #126.

PUT UNITY IN YOUR LIFE

Peavey Electronics has combined the latest in surface-mount technology along with its Unity manufacturing technology to create the Unity 4032. The 32 channel, 4-bus mixing console was designed for live sound reinforcement, and the use of surface-mount technology makes it slim and portable. Two of the four aux returns have 2-band EQ and aux send capability. Some of the high-caliber features include mutes, inserts, and full 12-segment LED arrays on each sub master; clip LEDs on each aux master; and PFL, mute, pan, and full assignment capability on each stereo aux return. Peavey also offers two Super Channels that provide low-



Spirit Live 8

Z mic inputs with pad and polarity switches. Low-Z discrete transistor mic pre-amps with 1/4-inch TRS inserts, 4-band EQ, 6 aux sends, and pan, mute, and PFL options on each channel make the Unity 4032 a live-sound workhorse. For further information, contact Peavey Electronics Corp., 711 A Street, Meridian, MS 39301. Tel: 601-483-5365. Circle EQ free lit. #127.

CATCH THE SPIRIT

Combining Soundcraft's 22 years of console design-experience and Spirit's design and production processes, Spirit introduces the Live 8. This 8-bus live mixing console is offered in four frame sizes — 16, 24, 32, and 40 mic channels — with up to 64 inputs available on the 40-channel model. All the Live 8 mono inputs feature four bands of EQ with two sweepable mids, while direct outs on every mono channel are internally selectable pre- or postfader to allow multitrack recording. In addition to eight group busses, the Live 8 also features six auxes (two that are globally selectable pre- or postfader), and a 10 x 2 Matrix section. Four stereo inputs with 2-band EQ and full access auxes, and eight stereo returns (four with EQ) to accommodate additional stereo sound sources or effects units round out the flexible Live 8. An optional 8-channel expander is available for the 16- and 24-channel frame sizes. For more information, contact Spirit, 11820 Kemper Rd., Auburn, CA 95603. Circle EQ free lit. #129.

SETTING SETTER

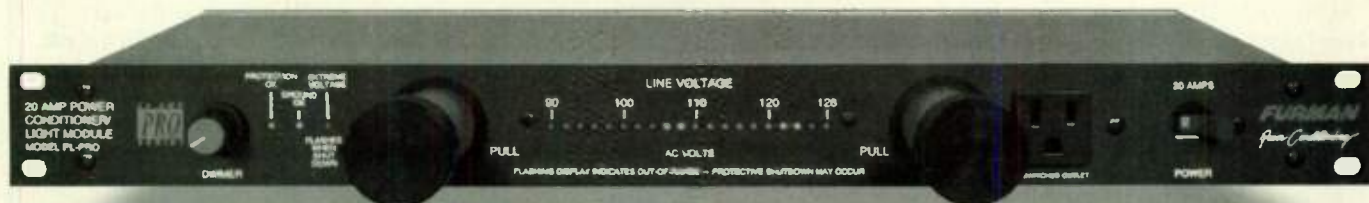
AudioControl Industrial's lasys speaker performance manager is designed to help you save time with system set-up and troubleshooting. With the push of a button, lasys will run through a series of tests that will give you valuable information such as where to set the crossover point, the crossover level, the limiter, and the delay. All the gathered information is presented in a clear, precise manner. The lasys's Help button makes operation fast and simple. To get the full story on the lasys, contact AudioControl Industrial, 22410 70th Ave W, Mountlake Terrace, WA 98043. Tel: 206-775-8461. Circle EQ free lit. #128.



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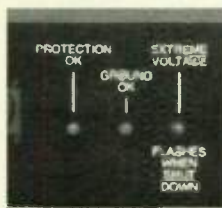


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Here's another Furman PRO Series exclusive you'll really like: Extreme Voltage Shutdown. Your PRO will not turn on if it senses abnormal mains voltages. If it's already on and detects that your voltage is too high or too low, the PRO shuts down power to its outlets, instantly. No damage to your equipment, no damage to your PRO. When the mains



You always know your power and protection status before your equipment is switched on

voltages return to normal, the PRO instantly restores clean, conditioned power to your equipment.

There's a new Furman PRO for every need: The PL-PRO (top) features an AC voltmeter with flashing alerts for marginally high or low voltages, and new precision-machined, dimmer-controlled rack lights that automatically switch off when either light tube is pushed in. The PM-PRO (left) is for applications where lights aren't needed — it adds an RMS-reading AC ammeter along with the voltmeter. The PS-PRO (right) applies and removes power from its outlet groups in a variable timed sequence, and alerts you to wiring faults with neon indicators.

All Furman PRO models provide LEDs to indicate Protection OK, Ground OK and Extreme Voltage Shutdown, widely-spaced rear outlets for "wall warts," and a 10 foot long, heavy duty, 12 gauge cord.

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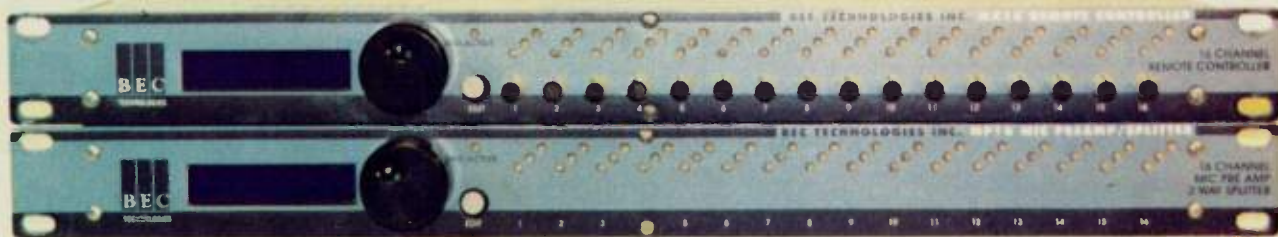
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BEC MP16 Mic PREAMP-SPLITTER



ALTHOUGH THE mic splitter has been a staple of the sound-reinforcement industry since the first use of on-stage monitor mixers, there have been relatively few commercial products available to handle this job. Most end-users and rental companies have built their own. Of course, these custom-built units ranged from the most sophisticated use of high-quality transformers and active circuitry to simple parallel connection of two or more male XLRs to a single female XLR. Whereas the former was capable of coping with any eventuality, the latter parallel approach would work OK on one gig and be impossible to keep quiet on the next.

It is not an easy task to split microphone outputs to feed different mixing consoles without creating any interaction between consoles or altering the sound of the microphone. And what about gain? Should the splitter merely output a signal level identical to the input, or should the signal be amplified before taking the 200-foot journey to the mixing console? If you must drive long mic lines in unfavorable conditions, you obviously want to amplify the mic's signal as soon as possible. This then presents the problem of how to control the gain, as this is like taking the mic trims from your console and placing them onstage where they are out of reach. This can pose some difficult prob-

lems when conditions onstage change during an event — such as when a trumpet player decides to suddenly solo into those soft-voiced backup singers' mics.

BEC Technologies has tried to address all of these issues in the design of the MP16 microphone preamp/splitter. The output level of each split is independently adjustable. An optional remote control unit, the MX16, places the input gain adjustment right at the mix position, no matter where the actual splitter may be. The MX16 remote unit has individual level controls for each input and communicates with the MP16 using standard MIDI protocol. The remote unit shares the same three-segment metering format as the mic splitter, so gain-structure problems are immediately apparent to the operator during the event. The MX16 even has the same user interface (wheel and LCD display) as the MP16. Audio levels are metered at several locations within each channel of the splitter so that warning of clipping is displayed in practically any internal gain structure the user may select.

The MP16 is an extremely compact, one-rack-unit box that handles 16 mic inputs and 32 outputs (2 x 16). That's a lot of XLRs. (Resourceful BEC engineers found an excellent high-density multipin connector that is then fanned-out with a

flexible multicable to inline XLRs.) Inside the unit is the largest number of Burr-Brown ICs I have ever seen on a single PC board. Burr-Brown is well known for its excellent audio quality ICs, and BEC has made liberal use of them in the MP16, allowing the unit to simply serve as a high-quality mic preamp if so desired.

All of the inputs and outputs are actively balanced and phantom power is selectable for each input. Input gain can be adjusted to allow up to 60 dB of gain or 30 dB of attenuation so that any mic or line input can be accommodated.

As noted above, the front-panel of the MP16 (and MX16 remote control) features an LCD and a data

wheel that gives the user access to the gain (in 0.5 dB steps) for each input and output. Onboard memory is used to store complete preset splitter configurations for later use or modification. Considerable thought has been given to the architecture of the preset storage, including the option of limiting remote access to only a single output (so the guy in the TV truck doesn't send the vocal mic into feedback in the on-stage monitors) and multiple-word names for presets.

This is the splitter for anyone that must accurately handle multiple stage setups in a single event. Recall of complete gain structure setups are only a turn of the knob away. This powerful

ROAD TEST

MANUFACTURER: BEC Technologies, Inc., 9460 Delegates Drive, Orlando, FL 32837. Tel: 407-855-8181.

APPLICATIONS: Anywhere high-quality mic signals must be shared between different mixers, such as stage monitoring or live recording.

SUMMARY: An excellent package of 16-by-2 mic preamps with preset gain and a remote control feature that can interface two different mixers to a single set of microphones.

STRENGTHS: Allows each user to have different gain settings; remote gain controller can also be independent; very high-quality mic preamps.

WEAKNESSES: Multipin connectors are very close together on rear panel; only two outputs per input.

PRICE: \$6500 for MP16 mic preamp-splitter and \$1500 for MX16 MIDI remote gain controller

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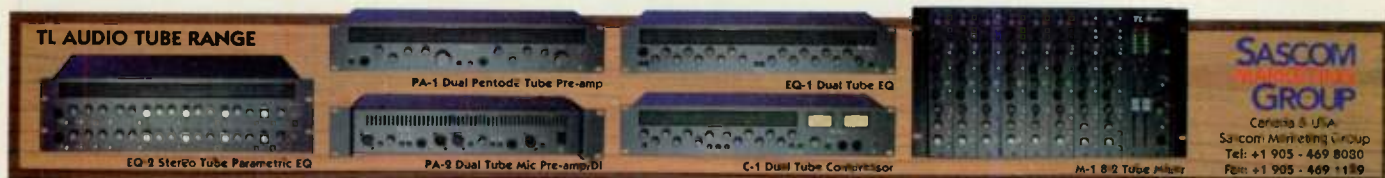
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The Trap With One Free Oops!

The all new Klipsch KP-3002-C could be just the ticket, especially if you're looking for a high output PA box that's expandable and won't break your pocket-book or your back.

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flexibility is reflected in the price of the MP16 and MX16, and the excellent audio quality is an added bonus.

The unit I had for review was an early production model and did suffer from a few minor glitches. For example, turning the individual remote level controls on the MX16 caused a zipper-like noise in all of the splitter's outputs. [BEC informs us this was a simple shielding problem that has been fixed in later production models. — Ed.] Also, the connectors are packed closely together on the rear panel of the MP16, causing the multipair cable to make a sharp bend at the connector. I would like to see a model that offers three or four splits from a single input, as there are many situations (e.g., stage, house, and recording mixes) where those are the basic requirements.

The MX16 remote control is a 1U device identically sized to the MP16. Both the MP16 and MX16 use a tiny whisper fan to cool their very dense inner workings. This should allow the units to be tightly packed into a rack without transferring too much heat between the units.

The user interface is a two-line LCD and a data wheel that is pressed to select between moving within layers of menus or selecting parameters on each layer. Although multi-layer menu systems take a little time to become familiar, the layout of these parameters is fairly logical. An additional EDIT button beside the data wheel is used to instantly jump from the operational mode (online) to the edit mode.

The MP16 is a high-end mic splitter that covers a lot of ground (which, of course, can be lifted) in a very small package and certainly beats trying to build a mic splitter when it comes to audio quality, isolation between mixer consoles, and gain control.

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CIRCLE 93 ON FREE INFO CARD

Yamaha RM800 Console



MANUFACTURER: Yamaha, 6600 Orangethorpe Ave., Buena Park, CA 90620-1396. Tel: 714-522-9011.

APPLICATIONS: Multitrack (up to 24-tracks) recording console.

SUMMARY: Clean-sounding, no frills, 8-bus recording console.

STRENGTHS: Inexpensive; great sound; very quiet; versatile.

WEAKNESSES: Limited patch points; no stereo mix bus assign on any of the 8 busses; 56 mixdown inputs, but only 8 direct channel outs.

PRICE: \$2399 (24-channel as reviewed; 16-channel/40-input: \$1699)

EQ FREE LIT. #: 131

RECENTLY, while driving my son to Little League practice, I mentioned *EQ* magazine had asked me to review the new Yamaha RM800 8-bus console. He looked at me and asked, "Dad, does the world really need another 8-bus mixing console...?"

Well, yes, if it's this one. You'll have to make some compromises for complex mixes, but considering that this board is considerably less expensive than anything else in its category, those compromises might be well worth making. What's far more interesting than what you *don't* get at this price is what you *do* get.

Ergonomics (ease of use) and, of course, sound quality are the most important factors for any mixer. Given the price, corners had to be cut somewhere, and Yamaha's engineers chose ergonomics. Nonetheless, with careful track planning, you'll be able to steer around what this board lacks. The corner that didn't get cut is sound, which is exceptional (particularly the low-noise and sensitive EQ) for a board in this class.

The mixer is housed in a battleship-gray steel case; connections and patch points are conveniently located on the top of the console. Starting at the top of the channel's input module and moving downward, you'll first

encounter a Mic/Line-Tape switch to select the signal source, 20 dB pad switch (the inputs handle signals from -60 dB to +4 dB), gain control (up to 44 dB for mic/line input, bypassed for tape return), and two status LEDs: postEQ green "activity" LED and red LED that lights at 3 dB below clipping.

The EQ section is musical, quiet, and simple to dial in. The high and low shelves are at 12 kHz and 80 Hz, respectively. The mids are wide band, and sweepable (250 Hz to 5 kHz). This type of EQ can't perform major surgery, but can perk up a listless kick drum or mellow out an overly bright guitar track. Each EQ has a bypass switch, but there are no high- or low-cut filters on any channel.

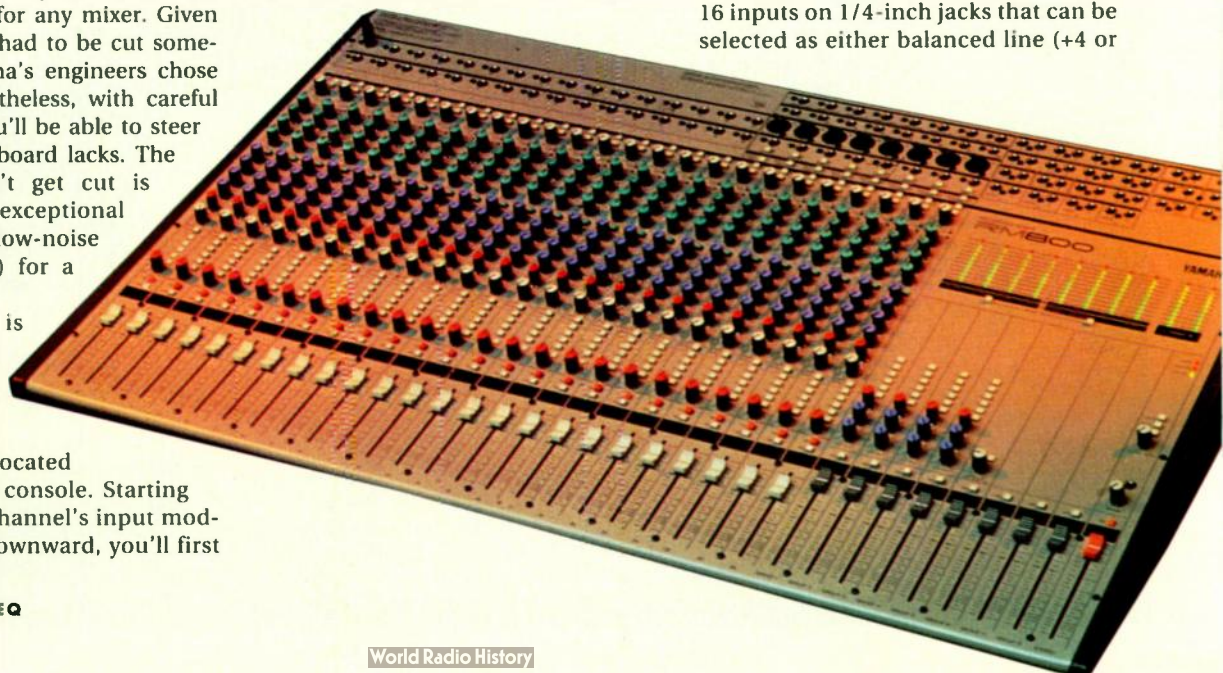
Six versatile aux sends compensate for some of the limited patching features we will discuss later. Aux 4 can serve as a mono mix source when tracking. You also get a combo Aux 5/6, selected via a pan control. Aux 5/6 can provide a stereo mix of tape tracks when tracking, or double as a source when mixing; this gives an additional 24 inputs (with panning) when mixing. The RM800 also contains four stereo bus assignable aux returns.

In total, the RM800-24 provides 24 tape returns, and you can access 56 inputs on mixdown (24 of those with the EQ mentioned above). Jacks are a mixture of balanced 1/4-inch and XLR (no RCAs). Besides the 100 mm faders, there are channel On/Off (mute) and PFL buttons. Overall, the package is easy to comprehend.

CONNECTIONS TO THE REAL WORLD

The budget price really shows up when it's time to plug in the patch points. Since some channels offer patching options (sends and inserts) and others don't, a little preplanning could save a lot of headaches later. Here's how the patch points break down.

Channels 1-16 offer three types of inputs on two rows of jacks: 16 tape returns (-10 dBV 1/4-inch jacks), and 16 inputs on 1/4-inch jacks that can be selected as either balanced line (+4 or



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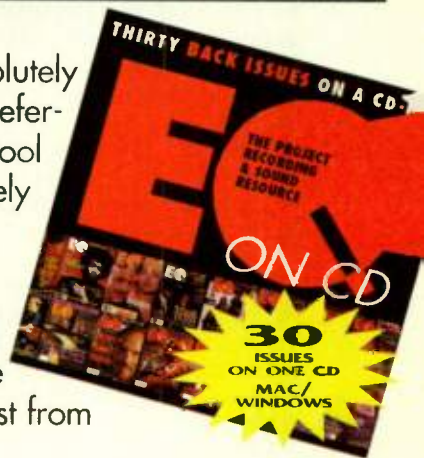
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-10 dB) or balanced mic (1/4-inch, TRS). You will need XLR-to-1/4-inch TRS adapters to use 1-16 as mic inputs. Channels 1-16 offer no channel direct out jacks, no inserts, and no phantom power. They can access all of the eight busses and the stereo bus.

Channels 17-24 are the most flexible: direct out jacks, phantom power (selected as a group for all eight channels), and individual inserts. Channels 17-24 also give you eight XLR connectors, which can be selected as mic or line level.

When cutting tracks, the RM800 provides 16 simultaneous outputs, eight channel direct outs on channels 17-24, and eight from the busses (select either -10 or +4). There are two bus inserts, located on bus seven and bus eight.

The RM800-24 offers 24 simultaneous tape returns, but remember to plan your track assigns before you actually record since direct channel outs and inserts exist only on channels 17-24. A nice feature is that inserts can be selected as either -10 or +4.

For elaborate mixes, a patchbay that breaks out your multitrack's outputs would be very helpful — no matter which 8-bus board you're working with. One solution is a half-normalled patchbay connected between your multitrack recorder's outputs and the RM800's tape returns. This gives tape outs for every tape track and insert points for all tracks. (If you don't understand patchbays, mults, and half-normalleds, there are many books on the subject. Or better, call in a good tech.)

MONITORING AND AUXES

The RM800 offers various monitoring options. Let's look at two common examples.

Assume you have a 16-track recording where you have a bunch of instruments bangin' all at once and backup vocals, percussion fills, and some leads done as overdubs. In this case, set up Aux 5/6 as the stereo control room mix and stereo headphone mix. In this setup, Aux 4 can be used as a mono send to an effects unit to "wet" the control room mix. Or use Aux 5/6 for your control room mix and send Aux 4 into the studio as a mono headphone mix for the talent.

You can also assign an effects unit to 5/6 and return the effect to the 'phones without sending the effect to tape.

The second example is an 8-track recording; consider getting away from the inline concept and return your eight tracks to eight unused channels. For instance, use 17-24 as tape sends via the channel outs (or group outs) and return your tracks on 9-16. This gives a separate control room mix on the big sliders and a stereo cue mix on the Aux 5/6 rotaries.

MASTER SECTION & METERS

The bare-bones master section contains three LEDs (power, phantom, and PFL/AFL-individual channels have no PFL-indicator LEDs) and three select switches: 2 track in, Mon/Aux 5/6, and Stereo Bus. There's no mono switch, which is helpful when checking for phase discrepancies.

There's no built-in talkback, so I used an old CB mic with an on/off switch patched into channel 1. You do get separate control room and headphone volume adjustments and a headphone jack. As for meters, the RM800 contains ten LED indicators. You can meter group outs, aux outs, PFL/AFL out, and the stereo outs, but not individual channels. No meter bridge option exists.

CUTTING TRACKS AND MAKING MIXES

I set the console up in my 24-track ADAT studio (Flashpoint Studios, Austin, TX) and did some sessions with the RM800. For the first session (solo singer/guitarist Matt Cartsonis) we set up a split mix, with 17-24 going to tape and 9-16 for monitoring. We also compared the RM800 mic preamps with a

Drawmer 1960 tube mic pre (compressor circuit disengaged); the results were pleasantly surprising. The tubes in the 1960 fattened the vocal presence, but Matt felt adding a slight amount of top end to the Yamaha came pretty close to achieving the same results.

Our main mixdown surprise involved subbing all our drum tracks to bus 7 and bus 8 (the only ones with inserts), then finding no way to assign bussed drums to the stereo mix. We did a workaround by patching out of bus 7/8 and feeding them back into two empty channels, then assigning those channels to the stereo bus. This meant additional gain stages and patching. Ideally, this board could receive each of the eight busses via the press of a stereo bus button, which is standard on most bussable consoles. [Yamaha states that using patch cords to access the tape returns are ideal for this purpose because they return to the stereo bus and have very little circuitry. —Ed.]

CONCLUSION

The RM800 is a perfect board for 8-track, and pretty great for 16-track. For 24-track, you can do everything you need to, but you'll have to add patchbays (at least for tape outs/returns) and plan your tracking carefully.

Examine your current requirements and envision where your studio will be in a year. If you're in the market for a small, clean-sounding, no-frills console, seriously consider the RM800-24.

—Bennet Spielvogel
Thanks to David Carroll Electronics (Tel: 510-528-8054) for the excellent Mogami TT1/4-inch patch cables needed to connect the RM800 into my patchbay.

CURRENT LOW-PRICED 8-BUS PLAYING FIELD

Allen & Heath GL4 24x8: \$4495

Mackie 24•8: \$3995

Peavey Production Series 2482: \$5000

SoundTech Panoramic 24x8: \$4000

Soundtracs Topaz 24x8: \$3995

Soundcraft Spirit Studio LC 24x8: \$3795

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TASCAM M-2600 24x8: \$3799

Yamaha RM800: \$2399 (16-channel, 40-input: \$1699)

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CIRCLE 67 ON FREE INFO CARD

World Radio History

Behringer Edison Processor



MANUFACTURER: Behringer GmbH, distributed by Samson Technologies Corp., 575 Underhill Boulevard, P.O. Box 9031, Syosset, NY 11791-9031. Tel: 516-364-2244.

SUMMARY: Inexpensive yet high-quality analog stereo image processor for spatial enhancement of stereo signals.

APPLICATION: Equally useful in the studio and for live performance, the Edison can enhance (or, in some cases, even help to repair) complete mixes or can be used to process individual sonic components.

STRENGTHS: Selective use can effectively spread the stereo image beyond the left-right plane of your loudspeakers; LMF Spread control enables the directionality of low-frequency instruments to be increased; notched controls allow settings to be easily reproduced; phase correlation meter (for mono compatibility checks) can be used independently of signal-processing circuitry.

WEAKNESSES: No input level control or meter; can cause frequency smearing and/or decreased mono compatibility when overused or when applied to inappropriate signals; skimpy documentation.

PRICE: \$279

EQ FREE LIT. #: 132

I AM, AS FAITHFUL READERS of my scribbles must by now be aware, seriously into stereo. The last time I recorded an instrument in mono was, oh, sometime in 1926 (OK, so sometimes I exaggerate), and I haven't looked back since. Our executive director, Hector La Torre, is fond of saying, "It ain't the number of notes, it's the spaces between the notes," but I take that a step further by maintaining it's the space (as in left-right, far-near, and up-down) between the notes that can turn music into magic.

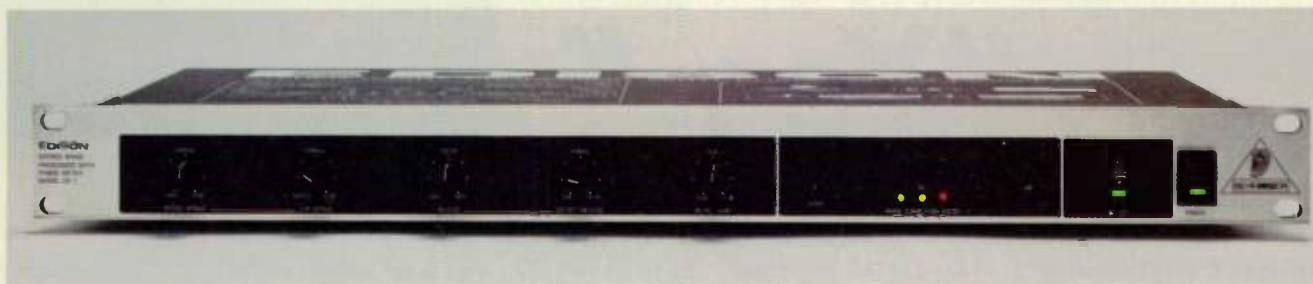
So you can bet I was excited when a Behringer Edison arrived at my doorstep for evaluation. Described as a "stereo image processor," the Edison is a completely analog product that provides a dedicated front-panel Bypass switch, an 11-LED phase-correlation meter (more

about this shortly), and just five adjustable controls (all of which are notched, so you can easily reproduce settings). Two of these controls (Output Gain and Balance) are easily recognizable, and do just what you'd expect. The other three (Stereo Spread, LMF Spread, and Center Distance) are the meat and potatoes of the Edison, and their functionality is described in only the most meager of terms in the adequate but somewhat skimpy owners manual. I surmise, however, that Stereo Spread raises or lowers the level of the outside (hard left-right panned) signal, acting on the full range of frequencies but also playing with the phase relationships so as to perceptually alter the width of the stereo image. At its fully counterclockwise setting ("Mono"), there is no stereo image

at all; the entire signal appears in mono from the "center" of your loudspeakers. As you turn the control clockwise (towards its "Wide" setting), the stereo image is spread so that hard left-right panned signals begin to appear from outside of the speakers, almost duplicating the effect of headphones, where a hard-panned signal seems to be coming from directly alongside your ears. In small doses and on particular kinds of program material, this effect can be quite stunning.

The LMF Spread control acts in a similar manner, except that it imposes itself only upon low midrange and low-frequency components (if I had to venture a guess, I'd say there's a low-pass filter set to about 200 Hz applied to the input). This is significant in that low frequencies are perceived by we humans as having little or no directionality—that's why you only need one subwoofer to reinforce bass. The function of the LMF Spread control is to restore some degree of directionality to low-frequency signals. In practice, however, this control generally causes more negative than positive benefits (frequency smearing, for one thing) unless applied very sparingly to specific kinds of signal.

Finally, the Center Distance control appears to have the opposite effect of Stereo Spread, increasing or decreasing the level of the center signal. When fully counterclockwise (its "Far" setting), this can serve to effectively remove vocals (as well as kick and snare drum) from many conventional recordings, which I suppose could have some use in karaoke applications. When fully clockwise ("Near"), the level of the center signal is boosted.



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20-21	BBE	8	714-897-6766	81	Rane Corporation	55	206-355-6000
113	Bell Electronics	49	903-784-3215	52	Rhythm City	36	404-320-7253
51	beyerdynamic	12	800-293-4463	57	Rockford/Hafler	82	800-366-1619
108	Caruso Music	44	203-442-9600	129	Russ Jones Marketing Group	73	818-993-4091
60	Conneaut Audio Devices	58	216-593-1111	79	Sam Ash Professional	56	212-719-2640
42-43	DigiTech	13	801-566-8800	49	Samson	10	516-364-2244
104	Disc Makers	14	215-232-4140	131	Sennheiser	54	203-434-9190
50	Discount Distributors	16	516-563-8326	15	Sony	XX	800-635-SONY
29	DOD Electronics	17	801-566-8800	68	Sound Deals	51	800-822-6434
14	E-mu Systems	19	408-438-1921	17	Soundtracs	53	516-932-3810
113	Empire Records	48	716-871-3475	87	Spirit by Soundcraft	37	818-909-4500
39, 69	Ensoniq	28, 25	215-647-3930	46	Studio Technologies	23	708-676-9177
47	Fairlight	20	310-287-1400	93, 105	Sweetwater Sound	93, 62	219-432-8176
64	Forge Recording Studios	21	610-935-1422	5	t.c. electronics	38	800-738-4546
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89	Furman Sound	65	415-927-1225	64	The Recording Workshop	39	614-663-2544
75	G Prime	45	212-765-3415	91	TL Audio	66	905-420-3946
113	Geoffrey Daking & Co.	24	302-658-7003	68	Trycho Tunes	71	909-696-3577
34	Greysounds	7	800-266-3475	63	Vestax Corporation	97	707-427-1920
52	Harris Allied	26	217-222-8200	34	West L.A. Music	40	310-477-1945
68	Harris Institute for the Arts	72	416-367-0178	72	Whirlwind	60	716-663-8820
109	Innovative Quality Software	27	702-435-9077	7	Yamaha Pro Audio	70	714-522-9011
132	JBL Professional	XX	818-895-8190				
92	Klipsch	43	501-777-0693				

JUST THE SPECS:

- **Input Impedance:** 60 kohms, balanced
- **Output Impedance:** 40 Ohms, balanced and unbalanced
- **Nominal Operating Level:** -10 dBV to +4 dBu
- **Maximum Input Level:** +20 dBu balanced and unbalanced (unity)
- **Maximum Output Level:** +26 dBu balanced/+21 dBu unbalanced
- **Bandwidth:** 5 Hz to 100 kHz, +0, -1 dB
- **THD @ +4 dBu:** 0.005% typical (all controls centered)
- **Noise and Hum, Unity Gain:** -92 dBu (20 Hz to 22 kHz, all controls centered)
- **Crosstalk @ 20 kHz:** Better than -50 dBu
- **Phase Correlation Meter Operating Range:** -30 dBu to +20 dBu
- Single-space 19-inch rack unit
- Internal power supply with standard IEC receptacle
- **Power Consumption:** 10 watts

Edison provides servo-balanced 1/4-inch and XLR inputs (though there is no input level control or meter) and can act upon any stereo signal fed to it. The question is, what kind of signals does it enhance most successfully? As with other "enhancers" or "exciters," the effect works best when applied judiciously — crank any knob to its fully minimum or maximum setting and the sonic result is most unpleasant. I found that the signals that most benefited from Edison's stereo processing were those that already contained a great deal of spatial and ambient information — for example, classical recordings of symphony orchestras in concert halls, or, at the other extreme, electronic sounds that are dynamically panned or have stereo delays built into them. Edison also does a great job of spreading the output of Leslie emulators, stereo flangers and chorusing units (the unit helped create some *killer* swirling 12-string guitars), and of pitch shifters such as harmonizers.

On the negative side, Edison doesn't do a very good job of processing the

output of reverbs, yielding a good deal of frequency smearing and, in some cases, even loss of spatial information. This is probably the reason why I didn't care for the results when playing in complete mixes of contemporary music (which usually contain multiple reverbs arranged in different spatial areas of the mix). On the other hand, Edison can help repair faulty mixes; for example, if a vocal is too low, increase the Center Distance control (bear in mind that this will also usually have the effect of raising snare and kick drum). This same fix can be used to increase clarity when playing back stereo tracks through a large, spread-out stereo PA system.

Edison also provides a bonus extra — the aforementioned phase correlation meter, which can be used in conjunction with or independently of the signal processing circuitry. This is used to check mono compatibility of stereo mixes — an issue that, even with the demise of vinyl, is still important (for MTV playback, if nothing else). Interestingly enough, this meter does a convincing job of showing just how increasing Stereo Spread or LMF Spread values cause a corresponding increase in out-of-phase components, meaning that large doses of Edison processing degrade mono compatibility even as they enhance stereo imaging — yet another argument for using the device sparingly.

There's no question that Edison is a specialty item, but used correctly, it can give your recordings that intangible "something extra" and can also help out with certain PA problems. Because there's no tutorial provided, you'll have to put quite a few hours into learning how best to use it and what kinds of signals it does and does not work effectively on. However, at an extremely affordable street price of about 250 bucks, it's hard to see how you can go wrong adding this clever little gem to your rack. —Howard Massey

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 generally knows which way is up.

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WorldRadioHistory



IN REVIEW

Focusrite Red 6 Mic Preamp-EQ



MANUFACTURER: Focusrite Audio Engineering, distributed in the U.S. by Group One Ltd., 80 Sea Lane, Farmingdale, NY 11735. Tel: 516-249-1399.

APPLICATION: Studios, postproduction, and live sound.

SUMMARY: Single-channel mic preamp and 4-band equalizer with variable high- and low-pass filters.

STRENGTHS: Superb sound and ergonomics; wonderfully variable; looks great.

WEAKNESSES: Nothing serious, but shelf/bell switching on the HF and LF might have been nice; it's not the cheapest superEQ around.

PRICE: \$2495

EQ FREE LIT. #: 133

IT DOESN'T matter how much gear you've got, there's always something that can tempt you still further. It's a fact of this business that the day you cease to drool over the latest gear is the day you make way for a younger person.

Focusrite Audio Engineering's Red 6 has all the qualities to make it an object of desire: a mono mic preamp and equalizer housed in a 2u case that you could bite. The brand is normally associated with the top-end Blue

range, but the Reds are aimed at putting the name within reach of more ordinary folk.

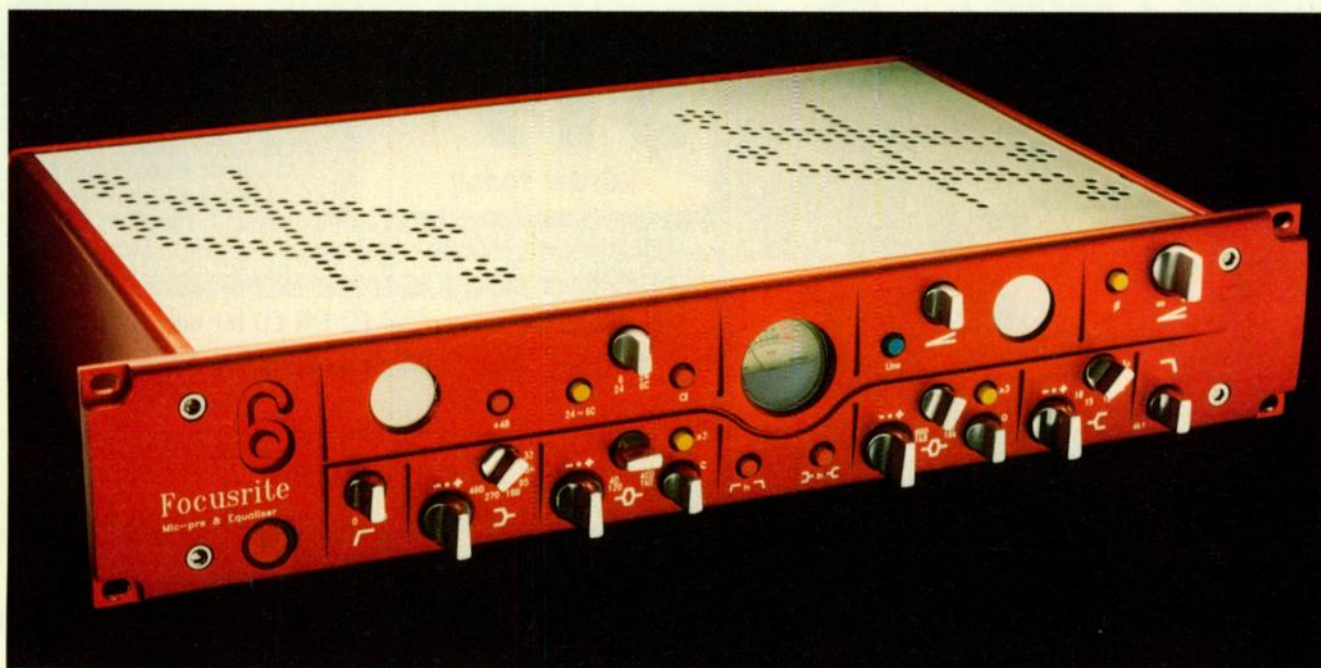
I/Os are transformer balanced with selectable mic and line input stages. The mic preamp has switchable phantom power and continuously variable gain over -6 dB to +60 dB in two switchable ranges, while line gain can be continuously adjusted over ± 12 dB. At the tail end there's a phase-reverse switch and an output-level pot variable all the way up from zero to +6

dB (the ability to make up gain is often left off outboard EQs).

The EQ section is a lesson in ergonomics, with the four EQ bands and high- and low-pass filters presented with the flow from left to right using an absolute minimum of front-panel legending and wonderfully smooth and precise metal pot caps. The two filters and four bands can be pressed into circuit independently, something that will be appreciated by anyone who likes to bracket down a signal with filters before deciding to EQ and removes the need to center all band boosts.

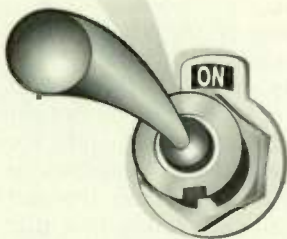
Filters are 12 dB/octave affairs ranging from 10 Hz to 30 Hz on the high pass and 4.7 kHz to 30 kHz on the low pass. For the spec conscious out there, in bandwidth terms the Red 6 boasts 3 dB down points at 5 Hz and 85 kHz.

All four EQ bands offer ± 15 dB of gain with switched frequencies in the HF and LF shelves and fully variable, fully parametric mids. HF offers 3.3, 4.7, 6.8, 10, 15, and 18 kHz with 33, 56, 95, 160, 270, and 460 Hz at the LF. Mid bands





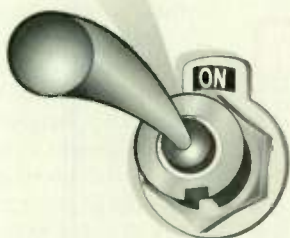
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have 3x multiplier switches to range from 600 Hz to 6 kHz and 1800 Hz to 18 kHz on the high mid and 40 Hz to 400 Hz and 120 Hz to 1200 Hz on the low mid. This is a far more approachable arrangement than the ultra-critical pot positioning required if these ranges were available on one sweep. Q values are variable from 1.0 to 0.3 for broad and traditional bands to finer incisive settings.

IMPRESSIONS

The mic preamp on the Red 6 is really quite exceptional, and if you're regularly needing only one channel of high-quality preamp, then you ought to be looking at this sort of quality. It's superbly fast with a rock-solid bottom end and the sort of classy top-end openness that only boxes like this have. Combine this with an exemplary

EQ section and it's a real contender.

What often differentiates EQs is the relationship they offer between pot turn and audible result. In this respect, the Focusrite has it figured out. Some EQs spend their lives cranked hard, which means that, for whatever reason, the majority of their gain resolution is wasted. All gain pot positions on the Red 6 are useful — from subtle 2-dB lifts and cuts to hard boosting and subtraction.

There is a great autonomy to the EQ bands (another classic attribute), and you can work with two bands in the overlap between them with predictable results. This is in stark contrast to the often quite pleasant and interesting interactive effects that occur in some EQs. Neither approach is necessarily more correct, but I mention it to explain that the Focusrite, as with other high-end EQs, is different in this respect.

I was most impressed with the EQ's performance at the extremes of the spectrum (the midrange is reassuringly traditional) because you can pile two bands plus a filter into the high and low end for intense control and monitor-wrecking bass and stereo-enhancing crystal treble.

The Red 6 is also surprisingly good at instrument processing; so when it's not being used for mic recording, you can DI up a guitar or bass for stunning results. Plus, if you're having trouble getting a keyboard part to cut through with the desk EQ, strap the Red 6 in to give it your best shot.

CONCLUSION

Perhaps predictably, Red 6 does not disappoint. From the reassuring click of switch relays and the great EQ to the deliberately retro circular front-panel VU meter that traces level, everything is about right. If pushed, I would have liked to have had a switchable shelf/bell on the HF and LF, but it's no big deal.

Focusrites aren't cheap, but Red 6 is cheap for a Focusrite. However, if you're playing with this sort of money you should give a listen to other bespoke EQs that live at this altitude. I believe you will find Red 6 gives a very good account of itself.

—Zenon Schoepe

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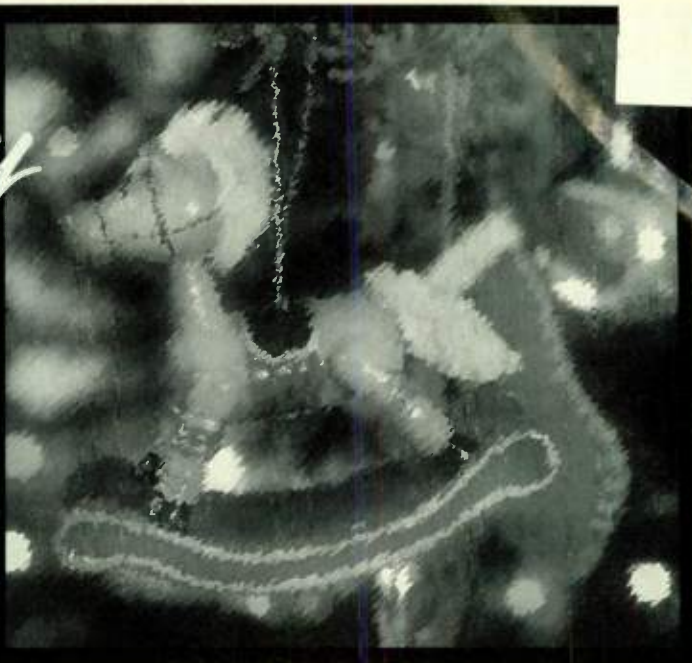


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World Radio History

Audix Studio 1A Nearfields

Take a listen to these monitors. Could they be just what you've been looking for?

BY BOBBY OWSINSKI

Sometimes, perhaps because of the popularity of a particular product, we believe certain manufacturers make only one type of product; so we're surprised when we find they make other things as well. Case in point: I've always equated Audix with microphones. Consequently, I wasn't quite sure what to expect when a set of its Studio 1A monitors were delivered to me for a listen. Since I am currently on a quest to find an all-purpose replacement monitor for the much maligned (especially by me) but mostly used NS-10, the Studio 1A's seemed to be a suitable candidate, at least in size.

The 1A is a compact monitor (13" x 9" x 10") featuring a single 6 1/2-inch polycarbonate woofer and a 1-inch cloth-dome tweeter that crosses over at 3 kHz. Audix claims the frequency response to be 50 Hz to 18 kHz (± 3 dB) with a sensitivity of 87 dB (1W @ 1 meter) and a power-handling capability of up

of up to 250 watts. The 1A is front-ported, so placement to rear walls is not as sonically critical, especially in studios with space problems. The speakers have an attractive matte black finish, black removable grilles, and weigh about 18 lb. each. Of special note is the fact that Audix takes considerable care in the manufacture of its woofers, making them from die-cast composite material, which is said to reduce distortion and magnetic interference due to the absence of a metal frame.

These speakers certainly are built well. They're much heavier than they appear, which in itself doesn't mean they'll sound good, but the mass does contribute to dampening the resonances that tend to give speakers their undesirable overtones. (I've yet to hear a great speaker that didn't seem as if it were made from concrete.)

In Studio A of Hollywood's Trax Recording, I connected the 1A's to their hefty Yamaha 2200 power amp (rated at 200 watts per channel @ 8 ohms, continuous power) and DDA AMR-24 console and set up to mix a

project for the socio-alternative pop group Sidnee. Sidnee offered an ideal cross-section of material for auditioning a new monitor, with lots of synths, real acoustic piano, Hammond organ, male and female lead vocals, and lush background vocals. Although most of the material utilized real players, one tune did also feature programmed drums.

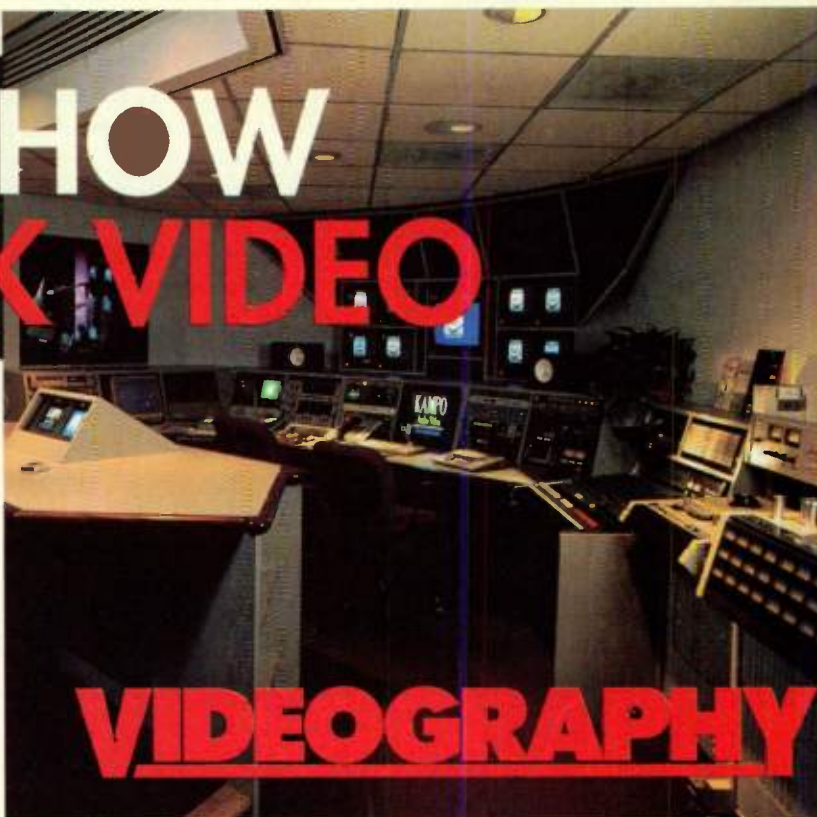
Upon first listening, I noticed that the 1A's seemed to require a bit more power to get to the level that I'm used to. It turns out that this is because the sensitivity is a bit on the low side, at 87 dB, instead of the more typical 89–91 dB found in similar monitors. Still, the monitors deliver signals that are plenty loud and can take just about any amount of amplifier power you can feed them. Level issue aside, the monitors initially sounded fine when listening to reference CDs during set-up. I could, however, only make it through about an hour of my first mix with the 1A's before I had to switch to my standard monitors. Something just didn't feel right to me, and not wanting to jeopardize the mix, I bailed.



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AUDIX PH-15 POWERED MONITORS

I have a soft spot in my heart for powered monitors, because of their ergonomics and (I feel) their generally better sound when compared to their nonpowered counterparts. Audix has entered the powered-monitor fray with its Powerhouse series, which includes five two-way models — from a small 3 1/2-inch woofer up to dual 5 1/4-inch woofers.

The model PH 15 (\$429; video shielded, \$449) of the series is a two-way system featuring a 3/4-inch polycarbonate dome tweeter and a 5 1/4-inch, long-excursion woofer in a vented, wood composite, 6" x 9" x 9" cabinet. The built-in power amp is rated at 40 watts per channel (under what conditions were not indicated), and Audix states that the usable frequency response is 50 Hz to 20 kHz.

What I really liked about these speakers is the fact that one unit acts as a master, containing the power amp and accepting dual RCAs for the input to both speakers. The same speaker also has a very convenient master volume control. The second speaker is connected by a supplied stereo 1/4-inch cable.



I had the pleasure of living with a pair of PH-15's for a few weeks and used them for a wide variety of applications, including several different computer-related projects, with excellent results. For multimedia playback, they sure beat the majority of so-called multimedia powered monitors you usually find connected to computers. It was a pleasure to hear sound from the computer coming back with some accuracy for a change. (Although, because multimedia sound can be really bad at times, it can also be a scary experience.)

I found the utilitarian aspects of these speakers to be extremely useful as well. For example, the volume control (controlling the stereo level of both speakers) on the rear of the master speaker made it ideal to use with a DAT machine or CD player in a room without a sound system. As a matter of fact, I did this several times, sending the artist into the lounge with just a portable DAT and the PH-15's to listen to mixes while I worked on something else.

The PH 15's give plenty of bang for the buck, and they are perfect for just about any multimedia or similar application that might arise. —Bobby Owsinski

Having been caught in situations like this before, I decided to resort to reading the manual (heaven forbid!) to see if I had overlooked anything during set-up. Sure enough, on a large gray insert in the manual were the words: "The grilles on your new Audix speakers are for transportation and storage purposes only. Please remove grilles when in use." No fine print here; it was clearly my oversight.

I put the 1A's back up for the next mix, pulled the grilles off, and suddenly everything made sense. The highs and upper mids that previously had seemed a bit muffled were now present as they should be. The bottom end was a tad light for me, but that's certainly understandable since we're talking about a relatively small cabinet here and my standard reference is a bit larger. Still, I found myself having to check more than usual on the larger, soffit-mounted monitors to make

sure that the bottom octave was doing what I wanted it to do. That aside, I had no trouble adjusting to the Studio 1A's, and, after a few mixes, found myself resorting to the larger monitors much less often.

I wound up mixing the entire album on the 1A's and found the frequency balance to be surprisingly close when we got to mastering. With that in mind I think I can safely say that if you're looking for a viable alternative to NS-10's (and who isn't) that won't cost an arm and a leg, try the Audix Studio 1A's. You will be pleasantly surprised that a company that previously specialized on the input side of things can do it so well on output as well.

Price: \$599; video shielded, \$659.
For more information, contact Audix Corp., 29103 SW Kinsman, Wilsonville, OR 97070. Tel: 800-966-8261. Circle EQ free lit. #134.

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JOE MEEK

continued from page 68

passage mixed dry was generally placed as such for effect as opposed to the other way around. A striking example is the wet lead-guitar line juxtaposed against the compressed in your face track on "Swingin' Low" by the Outlaws. Or the prominent drum against the silvery verb-laden music and vocals of Mike Berry's "Tribute to Buddy Holly."

On some occasions, Joe might cut vocals at Abbey Road, Decca, or Pye to use their echo chambers. Nevertheless, the delay sounds he achieved at 304 Holloway are simply astonishing. Geoff Goddard has made references to "a combination of tape delay echo (Vortexion) and *something up in the attic*." One could only guess that Joe had a concealed echo chamber up there.

Among his most precious and shielded inventions were the true secrets of his success. Two echo units — one bolt with a spring from a garden gate, the other with a broken fan heater's springs — inside a metal box taped shut hermetically. This knowledge was unraveled when brave IBC studio assistant Adrian Kerridge meticulously untaped the sacred container one night in Joe's absence. Surely there would have been hell to pay had its creator popped in during the proceedings.

GOING DOWNHILL

So, yes, the RGM domain was primitive by standards of today's overblown multitrack madness, as well as of some of his contemporaries — though not as crude as pundits previously presented. Maybe the lack of cosmetic couching and photos of a battery of tangled wires and reels with tape strewn about helped perpetuate this idea.

Joe truly believed in life on the moon and other planets (check "It's Hard to Believe It" by Glenda Collins), and immersed himself in all things otherworldly. Seances not only encouraged song ideas, but eerily predicted accurate chart positions and the demise of Buddy Holly, Joe's principal guiding light. The ouija said the singer would "rave on" out of this world on February 3, 1958. In fact, Holly's plane did crash on February 3 — 1959! After his death, Joe relied on advice from his fallen idol from the beyond.

As the swingin' '60s swung on, Joe was not able to jumpstart the inert hit-bound momentum originally created by "Telstar" and "Have I the Right," though the quality of his work never diminished. With a hurting cash flow, the problems



MEEK IN '66. Photo courtesy of the Joe Meek Appreciation Society.

befalling the undercapitalized independent writer/ engineer/designer/producer hawking master recordings to callous A&R men became insurmountable. Toss in his blinding paranoia, barbiturates, insomnia, haunting "spirit voices," the never-ending "Telstar" case, other nagging lawsuits from artists, harassing "gangster types," a demoralizing bust for "persistently importuning for an immoral purpose," and the looming possibility of eviction from 304 Holloway. On top of all this, Joe, along with other known "gay offenders," was to be investigated as a suspect in the murder of a teenage boy whose body was found dismembered and placed in several suitcases along the countryside!

On the morning of February 3, 1967, Joe Meek took a shotgun, wasted his landlady, and proceeded to blow his own brains out as she tumbled down the stairs. It was the eighth anniversary of the death of Buddy Holly.

THE MEEK LEGACY

They say you can't keep a good man down, so wherever Joe Meek currently resides he must be having a bit of a laugh. Never a hero in his own day, he'd delight to know that well over a dozen CD compilations of his productions have been issued in the UK and a British Joe Meek Appreciation Society [U.S. office: 171 Lakeshore Ct., Richmond, CA 94804] is thriving.

But what would he do if he discovered that some of his priceless conundrums have been debunked? Ted Fletcher, former session singer for Joe and one of the anointed with whom Meek actually shared technical data,

has recently developed and marketed the JOEMEEL compressor (see sidebar).

Where would we all be today had the world been a Meekless place? Joe opened doors for the British recording world and waxed sounds that did not exist on record before — anywhere. Sonically ahead of his time, he was every inch the visionary and conditioned our collective ears for what was to come and made it OK for future generations to do their wacky things — until the credit for that original vision was obliterated by arguable lesser "trailblazers."

Why isn't Joe Meek a household name? The sounds and conception of his discs were virtually *inconceivable* for their time. Suppressed and dismissed with a wave of jealousy and disregard by his peers perhaps?

The comparisons to Spector abound. Both men are certainly giants in audio, but did "The Phil" ever design and build his own equipment? Some may go on about Meek's schlockier tendencies (ditto for Spector), but he radiated them with such style. Just listen to the stuff on *It's Hard to Believe It*.... This guy had a true innocent rock and roll heart, and kicked everybody's ass into orbit (and then some).

...And he did it his way.

Acknowledgements and sources:
The Legendary Joe Meek by John Repsch; *Thunderbolt* (The Joe Meek Appreciation Society Magazine); John O'Kill; Ken Brown; Paul Verna; Bruce Harris; and Mike Stax of *Ugly Things Magazine*.

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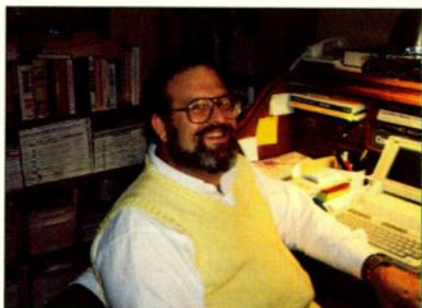
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No Recording Allowed

A compromise is reached
on high-density CDs —
but one that eliminated
their recording capabilities

BY MARTIN POLON



A public announcement was made at the end of September 1995 that signaled the decision to compromise on the features of the high-density compact disc that the public will see as early as mid-summer 1996 (although many analysts seriously doubt any product availability that soon). The so-called high-density MMCD (Multimedia Compact Disc), also known in some quarters as the DVD (digital video disc), from Sony and Philips has been merged with the Toshiba-Time Warner SD system. The formal name of the new compromise product remains unknown at this time. The compromise product will not record initially, and the date of availability of recordable units remains a serious mystery.

Discs produced to meet the standards of the compromise technology will be double-sided, use special adhesives to bond the two sides, have coatings to cover the entire disc, and cost two to three times the current cost of replicating a compact disc. It will provide playback of theatrical feature films so much in excess of two hours, that the capacity for two features exists for 90 percent of all films. The single-

sided MMCD system from Sony-Philips could accommodate only about 60 percent of the available movie titles, based on playing time for a single film.

What has been lost, at least in the short term, is the ability to record. Clearly, the real promise of the effort by Sony and Philips to extend their franchise on the original compact disc was the option for recording. The dream of the "One Machine" — the ultimate goal of both the consumer and the consumer electronics industry for ten years or better has been forever dashed by this compromise. No more one CD machine to record audio, video, and computer data on one disc with one piece of hardware in the home — at least not utilizing the high capacity compact disc format.

As for the potential for CD audio, compatibility is backwards for existing CD-audio software, with the promise that some of the new high-capacity audio CDs might carry audio information that could be read by some existing CD players. Sounds like a Bosnian peace accord. In other words, existing audio CDs can be reproduced on the new hardware. Forwards, the compromise technology should provide at least ten times the conventional compact disc's storage rate worth of music, if that is the choice taken on one extended disc. How all of this added capacity is used will remain to be seen for audio.

Technically, it could provide the much talked-up but never implemented potential to deliver the consumer a "premix down" 6- or 8-track disc with all of the elements of a conventional one-hour CD available for custom mix-down by the listener. What is more likely is the use of the supposed 18.8 GB capacity (as opposed to the current CD's 660 MB storage) for sampling rates far in excess of the present 44.1 kHz — some say a rate as high as 88.2 kHz is feasible. In addition, 20-bit or 24-bit audio data rates would be supported, far beyond the current 16-bit standard.

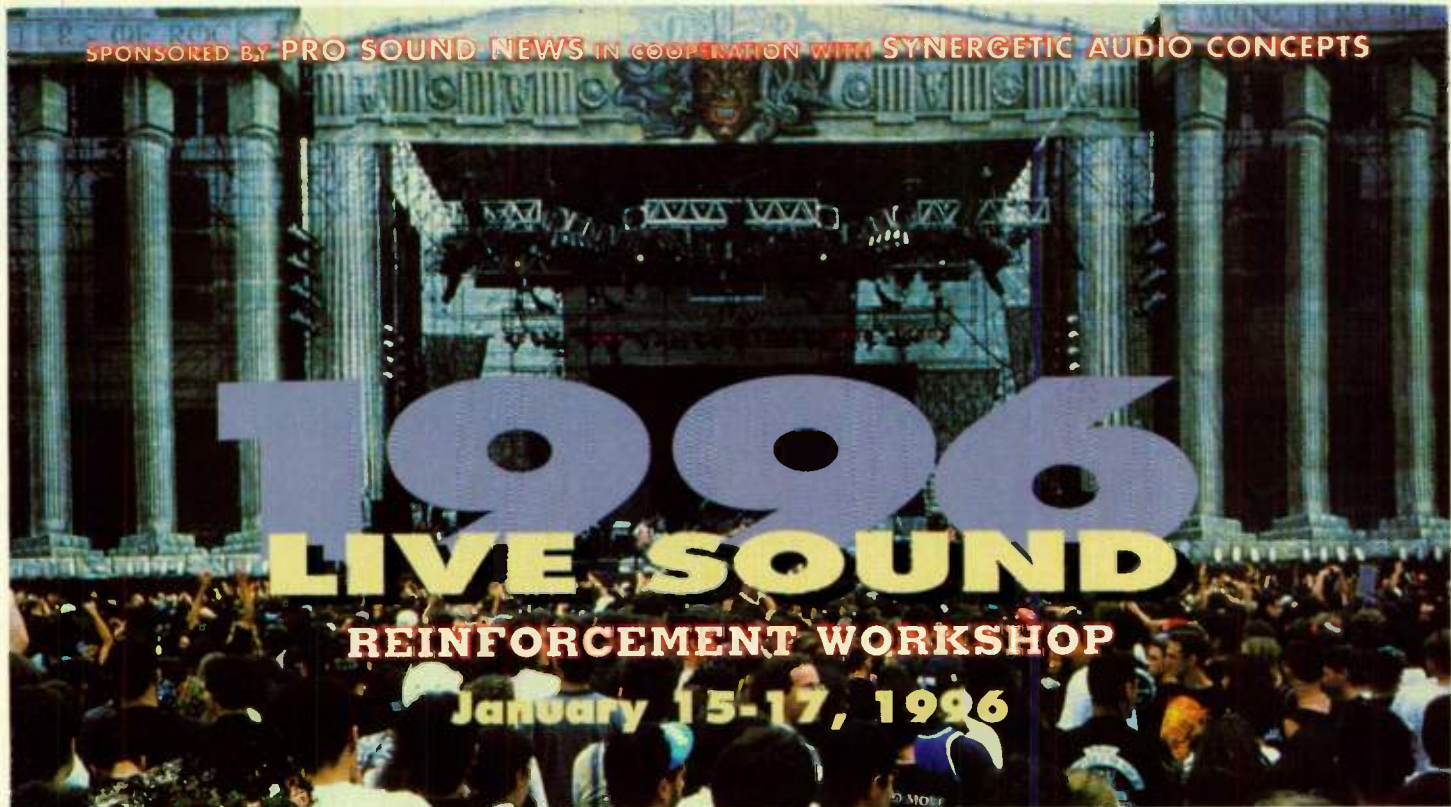
Other pertinent issues include: failure of the existing laser video disc base to grow; impending competition from the burgeoning recording CD marketplace (audio CD, CD-ROM); the need for replacement of analog VCRs

due to the extremely variable quality of both the home hardware and prerecorded tapes; and the future potential of new technology to provide an ideal playback format for home theater.

The decision not to provide recording capability as part of the new higher capacity digital CD system strikes many in and out of the record-label communities as a continuation of the battle being waged against so-called "illicit" copying. Every time a new digital technology appears with the capability of making digital copies of commercially released recorded media, it is an interesting "coincidence" that the record community goes bonkers about the copying potential of the new device. It is made clear within the press release on the technology compromise between the two digital CD camps that the decision not to offer recording capability was done because of incompatibilities in merging the two systems.

Yet it is equally curious that the record-label community does resort to technological gimmicks such as notch filters and detectors (Copycode) or copy counters utilizing control track flags (SCMS) to disable the threat potential of a new digital recording system such as DAT. The labels, according to some industry analysts, are not above forcing crippling companding algorithms affecting perceived audio quality on new technologies such as the MiniDisc or the Digital Compact Cassette via their direct or indirect connections to audio equipment manufacturers. So there is a certain convenience to the loss of recording functionality on the new CD system.

Curiously, if the record labels really want to engage in direct sales of recorded music via the Internet or direct fiber-optic download, the loss of recording capability on the high-capacity CD is indeed rather tragic. No other format currently exists to accomplish the capture of the download in a foolproof manner for the consumer mass market. Of course, the labels may not really want to engage in commerce on the I-Way. It is just possible that the size and anonymity of the Internet would make all of the independent labels just as important as the big six or seven record companies. More than one critic has suggested just that concept in print recently. **EQ**



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- Self-contained spherical filter to control explosive breath sounds ("pop") and wind noise in outdoor locations.
- Unusually effective cardioid pickup pattern to minimize background noise and undesirable effects of studio and location acoustics. Rear and side rejection uniform to very low frequencies and completely symmetrical about microphone axis.
- Bright, clean sound. Especially good for vocal music, announcing, narration and dialogue.
- Cartridge shock-mounted for protection and quiet operation.
- Wind and "pop" filter removable for cleaning or replacement.
- Versatility — designed for both field and studio use — hand-held or on a stand (slip-in swivel adapter included).

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The classic SM57 is the "workhorse" mic of stages and studios worldwide. Its carefully contoured frequency response means clean, well-defined instrumental reproduction and rich, warm vocal pick-up on lecterns or stages. The SM57 is the standard for drum, percussion and instrument amplifier miking.

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MKH 20 P48U3 Omnidirectional
Low distortion push-pull element, transformerless RF condenser, flat frequency response, diffuse/near-field response switch (6 dB boost at 10 kHz), switchable 10 dB pad to prevent overmodulation. Handles 142 dB SPL. High output level, ideal for concert, Mid-Side (M-S), acoustic strings, brass and wind instrument recording.

MKH 40 P48U3 Cardioid
Highly versatile, low distortion push-pull element, transformerless RF condenser, high output level, transparent response, switchable proximity equalization (-4 dB at 50 Hz) and pre-attenuation of 10 dB to prevent overmodulation. In vocal applications excellent results have been achieved with the use of a pop screen. Recommended for most situations, including digital recording, overdubbing vocals, percussive sound, acoustic guitars, piano, brass and string instruments, Mid-Side (M-S) stereo, and conventional X-Y stereo.

MKH 60 P48U3 Short Shotgun
Short interference tube RF condenser, lightweight metal alloy, transformerless, low noise, symmetrical capsule design, smooth off-axis frequency response, switchable low cut filter (-5 dB at 100 Hz), high frequency boost (+5 dB at 10 kHz) and 10 dB attenuation. Handles extremely high SPL (135 dB), ideal for broadcasting, film, video, sports recording, interviewing in crowded or noisy environments. Excellent for studio voiceovers.

MKH 70 P48U3 Shotgun
Extremely lightweight RF condenser, rugged, long shotgun, low distortion push-pull element, transformerless, low noise, switchable presence (+5 dB at 10 kHz), low cut filter (-5 dB at 50 Hz), and 10 dB preattenuation. Handles 135 dB SPL, with excellent sensitivity and high output level. Ideal for videofilm studios, theater, sporting events, and nature recordings.

TASCAM

DA-88 Digital Multi-Track Recorder

The first thing you notice about the eight channel DA-88 is the size of the cassette — it's a small Hi-8mm video cassette. You'll also notice the recording time — up to 120 minutes. These are just two of the advantages of the DA-88's innovative use of 8mm technology.

- The ATF system ensures that there will be no tracking errors or loss of synchronization. The DA-88 doesn't even have (or need) a tracking adjustment. All eight tracks of audio are perfectly synchronized. What's more, this system guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks — whether you have one deck or sixteen (up to 128 tracks!).
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48kHz (user selectable). The frequency response is flat from 20Hz to 20kHz while the dynamic range exceeds 92dB. As you would expect from a CD-quality recorder, the wow and flutter is unmeasurable.



- One of the best features of the DA-88 is the ability to execute seamless Punch-ins and Punch-outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks, whether you want to generate special effects or compensate for poor timing. All of this can be performed easily on a deck that is simple and intuitive to use.

Fostex RD-8 Multi-Track Recorder

Fostex has long been a leader in synchronization, and the RD-8 redefines that commitment. With its built-in SMPTE / EBU reader/generator, the RD-8 can stripe, read and jam sync time code — even convert to MIDI time code. In a sync environment the RD-8 can be either Master or Slave. In a MIDI environment it will integrate seamlessly into the most complex project studio, allowing you complete transport control from within your MMC (MIDI Machine Control) compatible sequencer.

- Full transport control is available via the unit's industry-standard RS-422 port, providing full control right from your video bay. The RD-8 records at either 44.1 or 48kHz and will perform Pull-Up and Pull-Down functions for film/video transfers. The Track Slip feature helps maintain perfect sound-to-picture sync and the 8-Channel Optical Digital Interface keeps you in the digital domain.
- All of this contributes to the superb sound quality of the RD-8. The audio itself is processed by 16-bit digital-to-analog (D/A's) converters at either 44.1 or 48kHz (user selectable) sampling rates, with 64X oversampling. Playback is accomplished with 18 bit analog-to-digital (A/D's) and 64X oversampling, thus delivering CD-quality audio.
- The S-VHS transport in the RD-8 was selected because of its proven reliability, rugged construction and superb tape handling capabilities. Eight tracks on S-VHS tape allow much wider track widths than is possible on other digital tape recording formats.
- With its LCD and 10-digit display panel, the RD-8 is remarkably easy to control. You can readily access 100 locate points, and cross-fade time is fully controllable in machine to machine editing. Table of Contents data can be recorded on tape. When the next session begins, whether on your RD-8 or another, you just load the set up information from your tape and begin working. Since the RD-8 is fully ADAT compliant, your machine can play tapes made on other compatible machines, and can be controlled by other manufacturers ADAT controllers. Your tapes will also be playable on any other ADAT deck.



Roland DM-800

Digital Audio Workstation

The DM-800 is a compact, stand-alone multi-track disk recorder that provides an amazing array of features at an unbelievably low price. Whether for music production, post production or broadcast, the DM-800 will make your work simpler, faster, more productive and more profitable. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing, to track-bouncing, to final mixdown. It fully supports SMPTE and MIDI time codes and also features a built-in Sample Rate Resolver to synchronously lock to any time code.

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- Optional RS-422 Interface (D10-8000) for 9-pin Control from Video Editor

FLEXIBLE I/O STRUCTURE

- Full Digital Patch Bay
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FULL AUTOMATION

- Dynamic and Snapshot Automation of Level, Pan 2-Band EQ, including Frequency Select, Boost and Cut
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TRIGGER FEATURES:

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MIDI FEATURES:

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- Internal Tempo Maps
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- 24 Bit Internal Processing
- Superb Converters

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TG-X 5

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- Acoustically coupled to capture shell sound as well as skin sound.
- Internally shock mounted for isolation from mechanical noise.
- Rugged construction with convenient clothes peg mounting.



TG-X 30/35

- Ultra-slim flexible gooseneck for easy positioning.
- Broadcast performance microphone with rugged construction.
- Lightweight, low profile adjustable neckband.
- Applications: Hands free vocals (drums/keyboards) and aerobics.
- TGX 30.15 Omni neckwork with pre-amplifier
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- TGX 35.15 Cardioid neckwork with pre-amplifier
- TGX 30.16 Cardioid neckwork for wireless transmitter

TG-X 40

- Hypercardioid polar pattern with excellent isolation from unwanted sound.
- Flat, wide range frequency response for uncolored sound reproduction.
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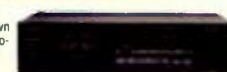
102 Cassette Deck

Designed primarily for mixdown, the 102 provides solid performance and sound quality with durability and reliability. Although it is a two head unit, the 102 closely matches the performance and features of Tascam's 103 Mastering Deck.

202MKII

Dual Recording Cassette Deck

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- Has balanced XLR input, switchable microphone (-60dB) or line (+4dB) inputs. A 12-pin digital connector provides interfacing with AES/EBU digital signals of 32.0, 44.1, or 48.0 kHz sampling rate. This means that compatibility with other digital systems is assured. It also provides the convenience of digital dubbing and editing without any degradation.
- Equipped with a comprehensive self-diagnostics function that constantly monitors the relation of the head drum, capstan and reels. The tape transport mode and load/unload time are continuously checked as well. Upon detection of trouble, the tape is brought to a forced stop and unloaded automatically to protect the tape and the recorder.
- Up to 99 start IDs can be recorded in the subcode area. When the record button is pressed, the start ID is recorded automatically for 9 seconds. During recording, it can also be added manually to any position of the tape. Search for these start IDs is performed in 1/200ths of a second.
- Offers a maximum spooling time of 140x normal speed. A two hour tape can be rewound or fast forwarded in under a minute.
- 20-segment digital peak level meters include overload indicators. Closely tracks input signal for accurate level indications.
- During playback, the date and time of recording is displayed.
- Has a 5-segment battery indicator. The last segment blinks on and off, notifying you to change batteries.
- To eliminate distortion caused by unexpected peaks, the TCD-D10 PRO II incorporates a record level limiter with a fast attack time of 300ms. The microphone attenuator prevents distortion by suppressing the signal level 20 dB.
- Immediate playback is possible through a built-in speaker.
- A wired remote controller is supplied to control the record, play, stop, and pause functions of the recorder. The top end of the controller is designed to accept a microphone holder. Two microphone stand screw adapters are also supplied.
- The supplied NP-22H rechargeable battery pack provides 1.5 hours of continuous operation. The optional NPA-D14 battery adapter enables 1 hour of continuous operation on AA-size batteries. With the use of the supplied AC-88 AC power adapter, it can also be operated on 100-240 VAC, 50-60 Hz.

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456-273J 1/2" x 2500 100" NAB Reel	33.99
456-572J 1/2" x 2500 100" Plastic Hub	52.99
456-573J 1/2" x 2500 100" NAB Reel	58.49
456-976J 1/2" x 2500 100" PREC	125.99

499 Grand Master Gold Studio Mastering Tape

499-174J 1/2" x 2500 100" NAB Reel	26.49
499-274J 1/2" x 2500 100" NAB Reel	37.49
499-977J 1/2" x 2500 100" PREC	134.99

SONY

PCM-2300/PCM-2700A DAT Recorders

The superb audio quality of digital recording and the convenience of DAT cassettes is not restricted to broadcasting and post-production applications. In fact, it is just as relevant to business and educational applications. To meet the requirements of all these sectors Sony offers the PCM-2300 and PCM-2700A DAT recorders. While both are perfect for simple recording and playback at recording studios, the PCM-2700A is also well suited for simple program transmission at broadcasting stations. Both feature exceptional sound quality, three sampling frequencies, absolute time recording, long record/playback time, alternative subcode recording and digital fader.



THREE SAMPLING FREQUENCIES

At normal tape speeds, either a 44.1 kHz or 48.0 kHz sampling frequency can be selected. When set to long play (LP) mode, they provide 12-bit non-linear digital recording at 32.0 kHz.

PROFESSIONAL PERFORMANCE

- The servo system is completely controlled by carefully programmed software. This features sophisticated, smooth transport control, which optimizes tape handling and increases the search speed to approximately 150 times normal.
- Absolute time can be recorded in the subcode area of the DAT tape. DAT tape with absolute time is ideal for editing with the Sony PCM-7000 Series Editing System, as it translates A-time into SMPTE time code.

DIGITAL FADER

A 64-step digital fader is incorporated in both units. Both fade-in and fade-out functions are available on the digital and analog inputs/outputs. The fade duration can be set over from 0.2 - 15 seconds, and can be controlled either locally or by the remote.

PCM-2300 AND PCM-2700A

- The PCM-2300 has unbalanced digital inputs/outputs (balanced and unbalanced), allowing most digital audio equipment to be directly connected. Both also have balanced analog line level inputs/outputs which can be adjusted over a range of -12 dBs to +8 dBs, for connection to many other types of audio equipment.
- The PCM-2300 has a reliable tape transport system driven by three servo-controlled motors, two direct-drive types for head drum and capstan, and a single DC motor for the reels.
- The PCM-2700A employs a four motor direct-drive tape transport with head drum, capstan and reels, all individually driven by servo-controlled motors. The four motor direct-drive mechanism gives even more precise and stable transport.
- PCM-2300 front panel display has a 20-segment peak level meter display with 0.5 dB step peak margin. The PCM-2700A has a 29-segment peak level meter with a 0.1 dB step peak margin indication.

SUBCODES

They record various subcodes separately from the audio data to provide tape search functions. The subcodes include the Start ID, Skip ID, End ID, Program Numbers, Absolute Time, and Date functions. Program numbers can be recorded sequentially as the Start IDs and are written (and can be renumbered) in the correct sequence whenever additional Start IDs are inserted.

OTHER FEATURES

- They operate in the Long Play (LP) mode, yielding twice the normal record/playback time. This also makes them compatible with the LP mode of consumer products. In LP mode, a maximum of four hours of recording and playback is possible.
- Built-in crystal clock generates a date function, which automatically indexes each recording with time and date info (minute/hour/day of the week/month/year). When tape is replayed it's easily checked for when the recording was made.
- Both units can be installed in a standard 19-inch rack.
- Both included a wireless remote control for remote operation.

PCM-2700A ONLY FEATURES

- Read After Write function allows you to monitor the recorded signal immediately after it has been stored on the tape. This saves you valuable time, as recorded signal can be checked monitored in real time.
- High-speed location, in either direction, to points on the tape with a resolution of 1 second by entering the absolute time address via keys on the front panel.
- Convenient remote operation is performed by the optional RM-D1700 Remote Controller. Connected via the 37-pin parallel remote connector, it allows basic tape transport control.
- Has 8-pin remote interface to give a fader start function, which is particularly useful for On-Air applications.
- When manually writing the Start, Skip, and End IDs, there is an enhanced rehearsal function which is available for accurate ID recording. While monitoring the ID recording, these can be related forwards or backwards in 0.3 second steps.

Panasonic

SV-3700/SV-4100 Professional DAT Player/Recorders



Panasonic's SV-3700 and SV-4100 are designed for professional applications. They have highly accurate and reliable transport systems with search speeds up to 400 times normal play speed. They also feature advanced, high-quality analog-to-digital (A-D) and digital-to-analog (D-A) converters and input/output circuitry designed to interface with the widest variety of devices.

SV-3700 Features:

- When recording via the analog inputs, a front panel switch permits selection of the sampling rate (44.1kHz or 48kHz). This avoids the need for a conversion of the sampling frequency in CD mastering applications. When recording through the digital inputs, it automatically clocks to incoming frequencies of 32kHz, 44.1kHz or 48kHz.
- Ramped record mute and unmuting with three seconds fade-in and five seconds fade-out provides automatic level changes at the start and end of a recording.
- High speed transport enables searching up to 250x normal speed. High-speed search up to 400x normal speed is possible once the tape has been scanned in Play. Fast-Forward or Reverse mode. This ensures access to any point on a two-hour DAT in approximately 27 seconds.

- Built-in shuttle wheel has two variable speed ranges: 3 to 15x normal speed in Play mode and 1/2 to 3x normal speed in Pause mode - an ideal way to find tape locations.
- Comprehensive display includes program numbers, absolute time, program time, remaining time and Table of Contents, which displays total recorded time and total PNO count for commercial prerecorded DAT tapes.
- Has XLR-balanced and unbalanced (phono) digital inputs and outputs. They provide direct interfacing with compact disc digital audio workstations and other components in a recording studio or production facility. Also has XLR-balanced analog stereo inputs and outputs. Output level is selectable between +4dB and -10dB. The input level is +4dB.

SV-4100 Has All the Features of the SV-3700 PLUS:

Offers enhanced performance required for professional production, broadcast and live-sound systems. Features such as instant start, external sync capability, enhanced system diagnostics, additional digital interfaces and exceptional 20-bit audio make the SV-4100 the DAT quality standard.

QUICK START WITH TRIM AND REHEARSAL

- With 8MB of memory holding five seconds of audio data, the Quick Start function provides sound almost instantly after a play command is executed. Other DAT recorders lag about 7 seconds, making them unsuitable for professional applications.
- Easily adjust the Quick Start position and specify it by A-Time, Start ID or PNO. Recording via Quick Start is also possible, allowing two SV-4100s to be used for frame-accurate punch-in/punch-out and assemble editing.
- You can adjust the Quick Start position with I-frame resolution over a range of ±50 frames. Using the shuttle dial and Skip key for adjustment. Frame number is preceded by + or - sign. A-Time, subcodes and peak level are displayed, to provide a general guide to positioning.
- Without playing the tape, you can monitor the level of stored data to check your Quick Start position. This preview capability is handy before actual editing or on-air play. Repeated play is also possible, using about 1.5 seconds of the data to create a kind of sampler effect.

FRAME ACCURATE INDEXING AND EDITING

- Using the trim and rehearsal functions, you can accurately determine points to write, start and skip IDs. These IDs can be written, rewritten or erased at any point in the recording and automatically renumbered.
- With two SV-4100s connected via the 8-pin parallel remote terminal, synchronized frame-accurate editing can be performed. Continuity of edit points can be checked by rehearsal playback. By entering and editing end position in one of the Locals buttons, you can determine a punch-out point as well.

FLEXIBLE SEARCH

- Easily and accurately access your A-Time. You can specify hour, minute, second and frame.
- In most modes, the currently displayed A-Time can be assigned to one of the Locals buttons. Then from Stop, Pause or Play you can rapidly cue to any of these four addresses by pressing its Local key. In addition, Local Last takes you to the most recent Quick Start A-Time position.
- Search is also possible by Start ID or program number.

5-MODE EXTERNAL SYNC

Has 5 external sync modes. External sync is essential for applications such as video postproduction and stereo mixing recording. It assures uniformity of timing between different equipment so the audio data consistently matches up with the target media.

- Select from 3 video external sync modes (25, 29.97 and 30 frames per second) or use the word sync or Digital Data modes (which lock to the input sampling frequency).

ENHANCED SOUND

The SV-4100 satisfies the highest professional expectations both in terms of sound and functionality. It features new 20-bit (equivalent resolution) digital-to-analog converters.

MULTIPLE DIGITAL INTERFACES

- Has XLR-balanced digital input and output plus unbalanced digital coaxial and optical inputs and outputs. Analog inputs/outputs are XLR-balanced and output level is switchable between +4dB and -10dB, providing compatibility with other equipment.

3-WAY REMOTE CONTROL

GPI input allows simple triggering of Quick-Start Play. 8-pin parallel remote terminal connects to another DAT deck, computer or wired remote. Includes wireless remote control.

TASCAM

DA-P1 Portable DAT Recorder



- With rotary two head design and two direct drive motors the DA-P1 offers one of the best transport in its class.
- XLR-balanced mic/line inputs (with phantom power) accept a broad range of signal levels from -60dB to +4dB.
- Analog line inputs and outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enables direct digital transfers.
- Uses next generation A/D and D/A converters to deliver amazing sound quality.
- Supports multiple sample rates (48, 44.1 and 32 kHz) and SCMS-free recording.
- Included in its design is a MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- To monitor your sound there is a TRS jack and level control for use with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. The DA-P1 includes a shoulder belt, AC adapter and one battery.

SONY

TCD-D7 DAT Walkman Player/Recorder



- High-quality Standard Play (SP) mode provides up to two hours recording of 16-bit digital audio on a SP-120 DAT cassette. The SP mode is ideal for recording live music.
- Long Play (LP) mode allows up to 4 hours of record/playback of 12-bit audio on a single DAT cassette. The LP mode is ideal for meetings, conferences or other voice recordings.
- Equipped with digital coaxial and optical input connector. Maintains highest signal purity for recording and playback of digital sources with all information retained in digital format.
- Also has analog MIC and Line inputs for recording from analog sources without external adapters.
- High-speed Automatic Music Sensor (AMS) search function finds and plays tracks, skips forward or back up to 99 tracks, all at 100x normal speed.
- Has a Digital Volume Limiter System (DVLS) that increases listening comfort and sound quality by automatically adjusting for sudden level changes of the recording. It also helps prevent sound leaks through headphones.
- Two-speed cue-review lets you hear sound while player is in fast-wind modes, up to 3x or 25x normal speed.
- Compact and portable, it has an anti-shock mechanism that permits accurate recording and playback even while in motion.
- LCD display with backlit windows clearly shows recording level, track number, operating status and 4-segment battery indicator, even in low ambient light conditions.
- Optional RM-D3K System Adapter Kit for complete digital interface. The kit is equipped with the input/output connectors for both the optical cable and the coaxial cable. Therefore you can use it as a relay between the TCD-D7 and other digital equipment. Also includes a wireless remote control.

JVC

XD-P1 Pro Portable DAT Recorder



- An integrated package, the XD-P1 Pro combines a DAT recorder and a microphone with digital output in an unbelievable light package.
- Records and plays at all three standard sampling frequencies. Choose from 32kHz for long recordings, 44.1 kHz for mastering it CD production or 48kHz for highest fidelity.
- Operates without the restrictions of SCMS (Serial Copy Management System), permitting one generation of digital to digital copy, using 44.1 kHz sampling frequency. You can digitally dub or copy a recording made on the XD-P1 Pro as many times as necessary.
- The supplied detachable digital output microphone provides two pick-up patterns: "Telegraphic" and "Stereo". A collapsible microphone stand is also supplied, allowing you to set the mic on a desktop for the interviews or conferences.
- Extensive use of aluminum and ultra-thin molding techniques make the XD-P1 Pro compact, lightweight and durable. The main module weighs under a pound (12.5 oz). With microphone and battery it weighs only 22 oz.
- All basic controls are on one side of the unit and readily accessible. You can operate the recorder using one hand.
- Advanced power-saving design and low power-consumption circuits give the XD-P1 Pro long recording capability - on a single battery charge. Optional rechargeable batteries further extend recording time.
- Supplied AC adapter/charger works anywhere in the world regardless of voltage or frequency.

ALL ITEMS ARE COMPLETE WITH ALL ACCESSORIES AS SUPPLIED BY MANUFACTURER

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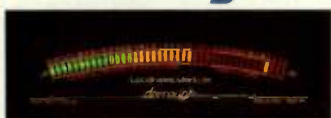
MM Series

MM842/1242/1642/2242
8/12/16/24 Channel Modular Mixers



- Electronically balanced XLR inputs
- Channel gain trim LED headroom indicator
- 3-band active EQ, sweep mid-band
- Individual channel meters for patching
- Direct outputs on each channel
- Assignable bar graph level indicator for left and right or group outputs
- XLR and 1/4" balanced outputs
- +48v phantom power

dorrough



With today's audio systems stretching the limits of program dynamics it's become critical for engineers to obtain maximum loudness with the minimum of distortion components, to fully utilize the dynamic range available. It is of equal importance that they have a method of monitoring and establishing the maximum safe level at which a system can operate.

That's why every Dorrough Audio Level Meter simultaneously shows 3 dimensions of program material content: Peak, Average Power and Compression are displayed on a color-coded 40-segment LED scale. Meters are easily viewed while providing precise indications of program energy content.

Loudness Meter Model 40-A

The model 40-A has a scale allowing 14dB of headroom in 1dB steps. 40-stand alone unit, it measures 1/2" x 2 1/4" x 6 1/2" and has an internal power supply. Model 40-AP has a peak-hold option as well.

Loudness Meter Model 40-B

The Model 40-B provides metering of relative loudness to peak modulation. The 40-B is a scale differentiation of the 40-A and is calibrated in percent (%) modulation with the lower scale in dB from +3 dB to -3 dB. The 40-BP also has a peak-hold option.

Symetrix

Signal Processing Products 601 Digital Voice Processor



- Accepts mic or line level analog signals, converts them to digital (18 bits) and then performs 24-bit digital domain signal processing.
- Processing includes fully parametric EQ, shelving EQ, notch filtering, dynamic filtering (noise reduction), de-essing, delay, chorusing, gain expansion, compression, AGC and DC removal.
- Combination of 128 factory presets and 128 non-volatile user programs guarantee predictable and repeatable effects from session to session, performance to performance.
- Has XLR-balanced analog mic and line inputs and XLR-balanced stereo output, XLR-balanced and S/PDIF (RCA) inputs and outputs, MIDI input/output supports connection to virtually any type of MIDI control device for programming or controlling the 601 in real time.
- Ideal for a variety of recording, broadcast, live sound, and post production applications.

488 Dyna-Squeeze 8-Channel Compressor/Interface

- Can easily increase average recording levels on your digital or analog tape recorder by 10dB with no side effects
- Tracks processed by Dyna-Squeeze have presence and increased articulation. Source sounds become more up front.
- Many professional mixing consoles have output levels that are much hotter than digital recorder inputs. The 488 matches any console to most any digital recorder.

**We are a full stocking dealer
for the entire Symetrix line**

TASCAM

M-2600 Series

16/24/32 Channel Eight Channel Mixers

LOW NOISE CIRCUITRY

- Combining completely redesigned, low noise circuitry with Absolute Sound Transparency™ the M-2600 delivers high-quality extremely clean sound. No matter how many times your signal goes through the M-2600, it won't be colored or altered. The signal remains as close to the original as possible. The only coloring you hear is what you add with creative EQ and your outboard signal processing gear.

- Double reinforced grounding system eliminates any hum. World-class power supply provides higher voltage output for better headroom and higher S/N ratio.

PREMIUM QUALITY MIC PRE-AMPS

- The M-2600's mic pre-amps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. This lowers distortion and widens dynamic range. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel.
- The M-2600 accepts balanced or unbalanced 1/4" inputs, and low-impedance XLR jacks. Better still, the TRIM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the -20 dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug anything in to it - keyboards, guitars, basses, active or passive microphones, samplers and more. No matter what you put into it, you can be confident that signal can be placed at optimum levels without a lot of fuss.

THE BEST AUX SECTION IN THE BUSINESS

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-ladder. Available all at once. Return signal through any of 6 stereo paths.



FLEXIBLE EQ SECTION

You'll find both shelving and split-EQ sections on some mid-level consoles. But that's where the similarities with the M-2600 end. The M-2600's bi-directional split EQ means you can use either or both EQ sections in the Monitor or Channel path, or defeat the effect altogether with one bypass button. Most other comparably-priced mixers will lock the shelving mix into the Monitor path only, limiting your EQ application.

ADVANCED SIGNAL ROUTING OPTIONS

Direct channel input switching. Assign to one of eight busses, 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.

ERGONOMIC DESIGN

The M-2600 has a big sturdy feel. All buttons are tightly spring loaded, look into place with confidence and are large enough to accommodate even the biggest fingers. The faders and knobs have a light, smooth "expensive" feel and are easy to see, easy to reach and a pleasure to manipulate. Center detents assure zero positions for EQ and PAN knobs. Smooth long throw 100mm faders glide nicely yet still confidently allow you to position them securely without fear of accidentally slipping to another position.

MACKIE

MICRO SERIES 1202

12-Channel Ultra-Compact Mic/Line Mixer

Usually the performance and durability of smaller mixers drops in direct proportion to their price. Fortunately, Mackie's fanatical approach to product engineering has resulted in the Micro Series 1202, an affordable small mixer with studio specifications and rugged construction. The 1202 is a no-compromise, professional quality ultra-compact mixer designed for professional duty in broadcast studios, permanent PA applications and editing suites where nothing must ever go wrong.

BIG CONSOLE FEATURES

- Working S/N ratio of 90dB, distortion below 0.025% across the entire audio spectrum, switchable +48 volt phantom power and +28 dBu balanced line drivers.
- Real switchable phantom-powered mic inputs with discrete, balanced mic preamps as good as those found in big consoles.
- Has 4 mono channels, each with discrete front end mic preamp input and four stereo channels, each with separate left and right line inputs.
- Every input channel has a gain control with unity at the center detent for easy setup. Also a pan pot, low frequency EQ at 80Hz, high frequency EQ at 12.5 KHz, and two aux sends with up to 20dB available gain.
- Main outputs operate either balanced/unbalanced, as required.
- Switchable three-way 12-LED peak meter displays.



- Master section includes two stereo aux returns, a separate headphone level control, monitoring and two stereo aux returns.
- Line inputs and outputs are designed to work with any line level, from instrument level, to semi-pro -10dB, to professional +4dB.
- Designed for non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio station, etc.
- Sealed rotary controls instead of open frame phenolic potentiometers that suffer from dust and contamination.
- Has steel chassis, rugged fiberglass circuit boards and a built-in power supply. Also has exceptional RF protection.

- Ideal "entry level" mixer for those just starting a MIDI suite.
- Ideal as headphone or cue mixer, level matching pro audio "tool kit" drum or effects sends submixer, 8-track monitor mixer.

CR-1604 16-Channel Mic-Line Mixer

The hands-down choice for major touring groups and studio session players, as well as for broadcast, sound contracting and recording studio users, the Mackie CR-1604 is the industry standard for compact 16-channel mixers. The CR-1604 offers features, specs, and day-in-day-out reliability that rival far larger boards. It features 24 usable line inputs with special headroom/ultra-low noise Unityplus circuitry, seven AUX sends, 3-band equalization, constant power pan controls, 10-segment LED output metering, discrete front end phantom-powered mic inputs and much more.

LOWEST NOISE, HIGHEST HEADROOM

- With the CR-1604, having the lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range) at the same time are not mutually exclusive. It is free of commonly encountered headroom restrictions, and is able to handle the occasional pegged input with ease. In fact, many drummers consider it the only mixer capable of handling the attack and transients of acoustic and electronic drums.

CONSTANT POWER PAN POTTS

- Only with constant power pan pots will a source panned hard left or hard right have the same loudness as when it is sitting dead center. While most small mixers pass simple balance controls for pan pots, the CR-1604's carefully optimized constant power circuitry makes it a professional tool with the kind of performance necessary for CD mastering, video posting and other critical audio production.

IN-PLACE STEREO SOLO

- Stereo "in place" solo allows not only the monitoring of level and EQ, but also stereo perspective. Usually found in very expensive mixers, stereo solo allows you to critically scrutinize and carefully build a mix using all the channels with their respective sends and AUX returns.

UNITYPLUS GAIN STRUCTURE

- Proper gain settings are facilitated by proper gain labeling, along with center-click detents on the faders, clearly understandable input trim controls and output meters that read channel levels in solo mode. With properly set levels you achieve very high headroom and low noise at the same time.

EFFECTS SEND WITH GAIN

- Unusual circuit design that provides two different "zones" that reflect real world use: send from each channel can vary in level from off to unity gain, which is the normal range of effects sends in other mixers. Since you also get another whole zone from the center detent to +15 dB of gain, the channel fader can be pulled down and the effects send can be boosted above unity when more effect is needed.

INTELLIGENT EQ POINTS

- Low frequency EQ is at 80 Hz, where it has more depth and less hollow midbass "bark". Midrange is centered at 2.5 KHz, providing for more control of vocal and instrumental harmonics. A specially-shaped -4 Hz curve that shelves at 12 KHz creates more sizzle and less aural fatigue.

REAL MIC PREAMPS

- The CR-1604 has genuine studio-grade phantom powered, balanced input mic preamps on channels 1 through 6. All CR-1604 (and XLR10) discrete input mic preamp stages incorporate four conjugate-pair, large-emitter germanium transistors just like the big mixers use. So, when recording nature sound effects to heavy metal or making flutes or kick drums, you get the quietest, cleanest results possible.

BUILT TO LAST

- The CR-1604 is designed for non-stop, 24-hours-a-day professional duty - even for tours that log 100,000 miles in three months. It has sealed rotary potentiometers that are resistant to airborne contamination like dust, smoke, liquids, and even the oxidizing effects of air itself!

Optional Accessories OTTO-1604

Add sophisticated computer controlled automation to your CR-1604. When connected to the MIDI port of your computer (PC, Mac, Amiga or Atari), each one of the 16 input channels can be programmed to change gain or to mute, just as you would program a sequencer. Master levels can be programmed as well, along with all buss channels.

XLR10

While the standard CR-1604 comes with 6 high performance mic inputs, there are times when you need more. Enter the XLR10. This simple-to-install accessory adds 10 more (for a total of 16) mic inputs, with the same quality, performance and features as those in the CR-1604.

SENNHEISER

Incorporating state-of-the-art technology and decades of experience, Sennheiser headphones offer outstanding design, superb audio quality and luxurious comfort. From the ear padding to the O.F.C. (Oxygen Free Copper) cable, all materials are carefully selected and precision engineered to ensure incomparable quality.

HD414 Classic

- A re-issue of the world's first open-air dynamic headphone, the HD414 Classic offers maximum transparency, fidelity and comfort. A limited edition model, the HD414 Classic also features Professor Sennheiser's signature on the headband.
- Radial based diaphragms for more accurate reproduction.
- Field replaceable parts for long-term enjoyment.
- Neodymium-ferrous magnets for broad frequency response (18-21,000Hz).
- 10ft. Kevlar-reinforced oxygen-free copper signal cable with 1/8"-1/4" stereo phone plug.



\$59.95

HD25 SP Studio Monitor Headphone

- Offering dramatic isolation from external sounds, the HD25SP is designed for professionals who rely on studio monitor headphones for work and pleasure.
- High-efficiency drivers for portable and field use.
- Modular parts for long term value and durability.
- Neodymium-ferrous magnets for broad frequency response.
- Frequency Response: 16-22,000Hz.
- Sensitivity: 105dB.
- Impedance: 70Ω.



\$119.95

HD265 Studio Monitor Sealed Headphone

- Designed to meet the stringent demands of studio professional and audiophile alike, the HD265 breaks new ground in the sealed-chamber headphone format.
- Sealed-chamber headphone format.
- Triple-wound aluminum voice coils for quick transients.
- Polycarbonate dome-damping minimizes distortion.
- Oxygen-free copper signal cable with 1/8"-1/4" stereo phone plug.
- Frequency Response: 10-25,000Hz.

\$199.95

HD535 Dynamic Hi-Fi Stereo Headphone

- The HD535's earcups surround your ears rather than resting on them, for a more natural listening experience.
- Open-back construction and classic design.
- Light aluminum coils in the transducer systems offers excellent transient and dynamic response.
- Supported by the open structure, tonal qualities develop high dimensional sound qualities.
- Circumaural, oval earpads for good wearing comfort.
- Can be connected to all digital and analogue Hi-Fi components.



\$139.95

HD545 Digitally Compatible Circumaural Headphone

- The HD545 is the headphone to which all in its price category must be compared.
- Polycarbonate dome-damping materials for clearer highs.
- Triple-wound aluminum voice coils mean powerful bass, high output and greater durability.
- Velvety soft, circumaural earpads and adjustable, padded headband for extended comfort and perfect fit.
- Oxygen-free copper signal cable assures optimal signal transfer.
- Includes 1/8"-1/4" stereo phone plug.

\$169.95

HD565 Digitally Compatible Circumaural Headphone

- Offering natural sound reproduction without tonal distortion - the choice for use with the most sophisticated equipment.
- Silk dome-damping for brilliant highs and ultra-smooth midrange reproduction.
- Copper-coated aluminum voice coils for high linearity.
- Bass-tube tuning for extended, powerful low frequencies.
- Velvet ear cushions provide lavish comfort.
- Oxygen free copper signal cable with 1/8"-1/4" stereo phone plug.

\$239.95

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Stewart

PA1000/1400/1800
Power Amplifiers



- High frequency switch mode power supply fully charges 120,000 times per second (1000 times faster than conventional power supplies) requiring far less capacitance for filtering and storage.
- High speed re-charging also reduces power supply "sagging" that affects other designs.
- Incredibly efficient, 5 PA-1000 or PA-1400's (4 PA-1800's) can be run on one standard 20 amp circuit. There is no need for staggered turn-on configurations or other preventive measures when using multiple amp set-ups, as current drawn during turn-on is only 6 amps per unit.
- They produce smooth and uncolored sound, while offering very full, detailed low end response and tons of horsepower.
- They each carry a 5 year warranty on parts and labor.

PA-1000 weighs 9 lbs., is 15" deep and occupies one standard rack space. Delivers 1000 watts into 4Ω when bridged to mono.

PA-1400 weighs 16 lbs., is 15" deep and takes 2 standard rack spaces. Delivers 1400 watts into 4Ω when bridged to mono.

PA-1800 weighs 17 lbs., is 17" deep and takes two rack spaces. Delivers 1800 watts into 4Ω when bridged to mono.



Performance Series Amplifiers



Performance Series 1 300 Watt Power Amplifier

- Measuring only 3.5 inches high and weighing 26 pounds, the Series 1 delivers more than 150 watts per channel.
- Its welded steel chassis is unbelievably strong while a custom heat sink extension provides exceptional thermal capacity.
- An internal fan provides quiet background noise levels for critical monitoring applications and when pushed hard the cooling system insures continuous cool operation even in the most demanding situations.
- Active balanced inputs with both XLR and 1/4" phone jacks.
- Supplied with quality 5-way binding posts for highly reliable speaker connection.
- Front panel handles are reversible for either rack mount installation or easy handling.
- LEDs are provided for signal presence and clip indication; the detection gain controls have large knobs for easy front panel adjustments.

Performance Series 2 600-Watt Power Amplifier

- Same as above except the Series 2 weighs 33 pounds and delivers more than 300 watts per channel.

Performance Series 4 1200-Watt Power Amplifier

- Same as above except the Series 4 weighs 53 pounds and delivers more than 600 watts per channel.
- Has a switch selectable clipping eliminator that prevents damage to the speakers.

TANNOY

System 6 NFM II

A 6.5 inch Dual Concentric with Tullip HF wave guide forms the heart of the System 6 NFM II providing a reference single point source monitor in a more compact enclosure than ever before. Every aspect of design fully complements the drive unit's capability. The rigid cabinet with carefully contoured baffle and trim minimizes diffraction and the high quality minimalist DMT crossover and gold-plated Bi-Wire terminal panel optimize the signal path. Pin-point stereo accuracy with wide frequency response, good power handling and sensitivity make this an ideal nearfield monitor.



PBM Series II Reference Monitors

The PBM II Series is the industry standard for reference monitors. They feature advanced technologies such as variable thickness, injection molded cones with nitrile rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected indicators. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability, and most important, real world accuracy.

PBM 5 II

- Custom 5" injection-molded bass driver with a nitrile rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- Woofer blends seamlessly with the 1" polyimide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring.
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density medite for minimal resonance and features an anti-diffraction radiused front baffle design.

PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" lowfrequency driver and 3/4" tweeter are fed by a completely redesigned hardwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radiused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.



PBM 8 II

- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors and components available.
- Full cross-braced matrix medite structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities.



TURTLE BEACH SYSTEMS

Turtle Beach audio cards bring true studio performance to the PC platform. Based on the technology used in their professional products, the performance of both their hardware and software has garnered accolades from users and press alike. Unlike other PC-based audio cards, Turtle Beach products are not designed for sound card game compatibility. Instead, the design philosophy is to give the best possible performance and quality, in the Windows operating environment, while bypassing traditional PC limitations.

MULTISOUND MONTEREY Multimedia Sound Card

The next generation of Turtle Beach's award winning Multisound board, Monterey offers high quality performance and features at a very reasonable price. Multisound's Hurricane technology provides very high speed audio data transfer between the card and the hard drive. This approach allows for data throughput up to eight times faster than the more common DMA designs, while putting minimum burden on the CPU (critical if you're recording audio and video simultaneously).

- The Motorola DSP-56001 Digital Signal Processor operates at 20MIPS and performs all digitization functions with very low system overhead.
- High S/N (-89dB, A weighted), low distortion (<0.01% THD, <0.01% peak-to-peak A weighted), flat frequency response (20-19KHz 0.5dB).
- On-board real-time effects processor for a variety of effects, including reverb and echo.

- Professional quality MIDI synthesizer with wavetable playback (4MB of real instruments audio). Up to 4MB of standard SIMM-type memory can be added for sampling of new sounds.
- True 16-bit recording, using 64x oversampling and sigma-delta conversion technology.
- True 16-bit playback, with 64x oversampling and sigma-delta conversion utilizing 18-bit DACs, and an 8x interpolating filter.

WAVE 2.0

Professional Sound Editing for Windows 3.1 Compatible Sound Card

Wave is simply the best audio recording/editing/effects program available under Windows 3.1. With its logical layout, plethora of functions and wealth of effects, Wave will become an indispensable tool in your studio. Wave has the features (and interface) of a tape recorder. It supports stereo or mono recording/playback at 11,025, 22,05 or 44.1KHz sampling rates. Wave will work with any Windows 3.1 compatible audio board.

- Supports cut & paste editing (just like editing in a word processor) and has a full Undo function to eliminate fatal mistakes.
- Gain adjustment can be made to a whole file, or just the section you highlight.
- Wave can import and export a large variety of file formats, including SMP, SFI, WAV, 16, 8 and VOC. In addition, you can change the sample rate of previously stored files.
- EFX Clips function provides real professional effects like distortion, flange, digital delay, reverb, auto-stutter and others.

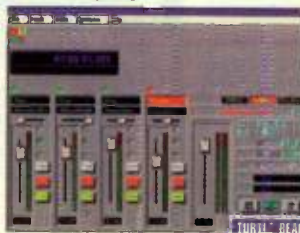
- A four band parametric equalizer function (WaveEQ) gives you the ability to touch up sections of your audio as well as the whole file. You can easily correct flaws in the sound or for the special effects.
- Speed control lets you adjust the playback rate of your recorded audio (up to 200% faster or 50% slower).
- You can mix up to three sound files into a new fourth one, with control of volume and starting time of each file.
- Glitches in the recorded sound can be repaired by simply drawing the correction on the waveform with your mouse.

QUAD STUDIO

Professional 4-Track Recording System

Quad Studio is the first real-time four track recorder for the PC. Now you can record two tracks directly to your hard drive (16ms or faster), then record two more tracks while playing back the first two. With its high performance and ease of use, Quad Studio is the perfect replacement for 4 channel mixer/cassette decks.

- Graphics interface simulates all common mixer/tape deck controls.
- Record, overdub, mix and bounce tracks in real time with no loss of quality.
- Previously recorded audio can be effects processed (using the optional Wave program) and then mixed, in real time, with new audio.
- Includes Turtle Beach's high-performance Tahiti board.
- Software is also separately available for Monterey cards.



BEHRINGER

MDX 1000 Autocom Automatic Compressor/Limiter



- Incorporates an interactive auto processor for intelligent program detection. With the auto processor, the attack and release times are derived automatically from the respective program material - preventing common adjustment errors.
- The auto processor also allows you to compress the signal heavily and "musically" in dynamic range without any audible "pumping" "breathing" or other side effects.
- Provides both Attack and Release controls allowing for deliberate and variable sound processing.
- Switchable soft knee/hard knee characteristics. Soft knee is the basis of the "inaudible" and "musical" compression of the material. Hard knee is a prerequisite for creative and effective dynamics processing and for limiting signal peaks reliably and precisely.

MDX2000 Composer Interactive Dynamics Processor



- Powerful and versatile signal processing tool provides 4 most commonly dynamic control sections: fully automatic compressor, manually controlled compressor, expander and peak limiter.
- Innovative IKA (Interactive Knee Adaptation) circuit combines the "musicality" of the "soft knee" function with the precision of the "hard knee" characteristics. Provides subtle and "inaudible" compression of the sound allows creative dynamics processing.
- Auto processor provides fully automatic control of attack and release times. There is also manual control.
- Interactive Ratio Control (IRC) expander eliminates "c" chatter" on or around the threshold point.
- Interactive Gain Control (IGC) Peak Limiter combines a clipper and program limiter. This allows for "zero" attack, distortion-free limitation of signal peaks.
- IGC is invaluable in live applications. Servobalanced inputs and outputs. Operating level switchable from -10dB to +4dB.

PEQ305 Studio Parametric The Musical Equalizer

- Five independent, switchable bands. The quality of each of the five frequency bands can be modified gradually from notch to broad-band characteristics. This offers more flexibility than any graphic equalizer can provide.
- Bands 1 and 5 are switchable between shelf and peak. This is extremely useful, since acoustic problems usually occur in the upper and lower frequencies.
- Utilizes the "Consistent Q" principle to eliminate interaction of the parametrics frequency, bandwidth and amplitude. The same applies to interaction between the individual frequency bands.
- Parallel arrangement of the individual filters reduces phase shifting and associated delays to a minimum.
- Potentiometer response follows human hearing characteristics.
- Relay-controlled hard bypass with auto-bypass function during power failure.

DEQ8000 Ultra-Curve 31-Band Digital Graphics Equalizer/Analyzer

The DEQ8000 is an innovative programmable graphic equalizer/spectrum analyzer built with digital technology. A two-channel unit, it features Burr-Brown 20-bit A/D and D/A converters for input and output. It achieves the dynamics and audio quality of analog equipment while avoiding the drawbacks of analog filters such as tolerances in components.

- Programmable two-channel equalizer with 31 graphic bands on digital basis.
- Filter settings are displayed either in the form of display side controls or as a filter curve representing the actual frequency response and taking the influence of several adjacent filters into consideration.
- Shelving function makes the moving of groups of filters possible.
- Up to 3 additional notch filters can be used whose frequency and bandwidth is freely selectable.
- Search and Destroy function automatically detects resonant frequencies, thus acting as an automatic feedback suppressor.
- The integrated Real Time Analyzer features both peak and RMS weighting, a noise generator with a separate output and a broad selection of auxiliary functions such as variable integration time, peak hold, etc.
- In Analyzer mode, a cursor is used to poll the amplitude of the single bands with an accuracy of 25dB.
- The signal source (measuring microphone or equalizer input) fed into the analyzer input is freely selectable.
- Various analyzer measurements can be saved and recalled for reference purposes.
- Auto EQ mode combines the analyzer with the equalizer section and thus allows for the automatic equalization of acoustic environments. Within 0.5 seconds, the Ultra-Curve provides a linear frequency response based on the actual room acoustics.
- MIDI interface allows for selecting memory locations from and external MIDI controller. Remote control of all Ultra-Curve parameters can be realized via system exclusive information. ALSO, several units can be linked together via MIDI.

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BROADWAY

continued from page 86

nostics, naming channels, and also as a set of backup controls in the event of failure of a surface control. A jog wheel in conjunction with transport control switches (NEXT, LAST, VIEW, and CANCEL) navigate the engineer through a sequential cue list. The wheel contains an integral switch, so after scrolling through a list of cues, pressing the wheel in will recall the highlighted preset scene (this can also be done with the execute key).

The Broadway comes "stock" with eight "VCA" faders and a crossfader in the Master Control Surface. Of course, given the nature of the Broadway's architecture, the VCA faders are really digital group controllers. Any or all of these may be set to generate MIDI-continuous controller data that appears at the rear panel MIDI Out port. An eight-character display is available for naming the groups. The crossfader allows an engineer smooth transition of console parameters between two cue scenes. If all that doesn't provide you with enough control, you can add a VCA Extender Sur-

face that adds 12 more VCA faders and a meter bridge with 20 assignable meters. And a 32-channel meter bridge is an option that can indicate signal level at any of the 32 grauxes plus the main outs.

One of the really neat things that Soundcraft has addressed with the Broadway is computer control. The system can be controlled by any number of networked PCs with Soundcraft's "PC Broadway" software for Windows. Any system parameter may be accessed and each PC can be defined to have limited control. This might allow a "master" PC station full access over all real-time functions, while possibly limiting another operator to sceneset automation only. Revisions of PC Broadway software will be provided to users free of charge.

We here at *EQ* are aware that the Soundcraft Broadway is priced well into the blue-chip level. But the point is that (as with most audio technology) the power and flexibility of the Broadway will eventually trickle down to the middle and lower echelons of sound reinforcement. The Broadway really opens up some new territory for live-sound automation with the kind of power that makes life at front-of-house easier.

ACROSS THE BOARD

continued from page 130

will let you write mixed-mode CDs without spaces between the audio tracks.

- Another pair of Alesis Monitor Two speakers so my daughters will stay away from mine.

- An Audio Precision System Two with all of the extra bells and whistles.

- One of the new TimeLine optical disc 8-track recorders.

- A working copy of Windows 95.

- Free Internet access and Web page storage.

- A "Deer Crossing" sign for my driveway.

- A set of four tires (I don't need any, I just think that I should have a front yard that matches my neighborhood).

- A personal tutor so I could learn to speak fluent C++ without a southern drawl.

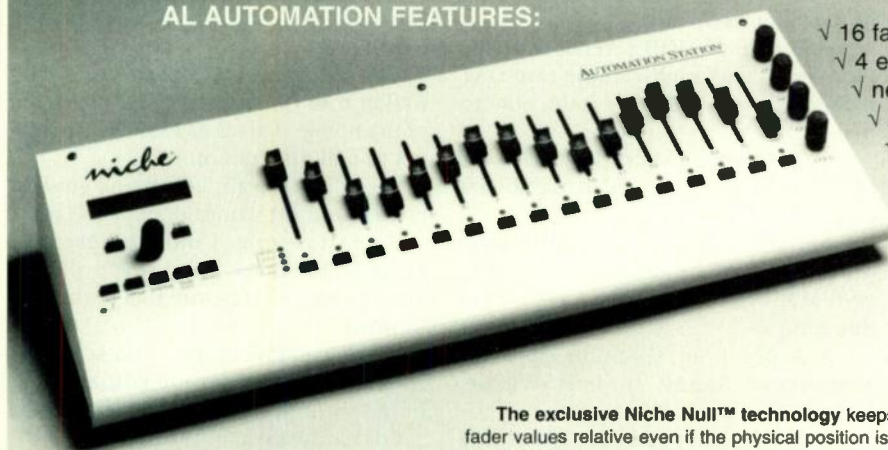
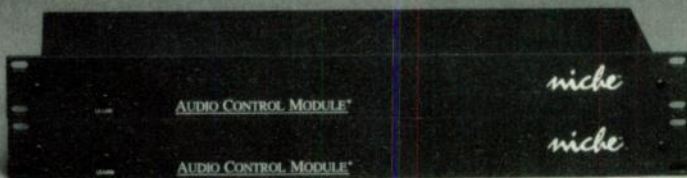
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[Editors Note: We're sorry, but we had to cut Roger off, as his list was basically endless. Maybe if he gets some of this stuff he will be calmed down by next month.]

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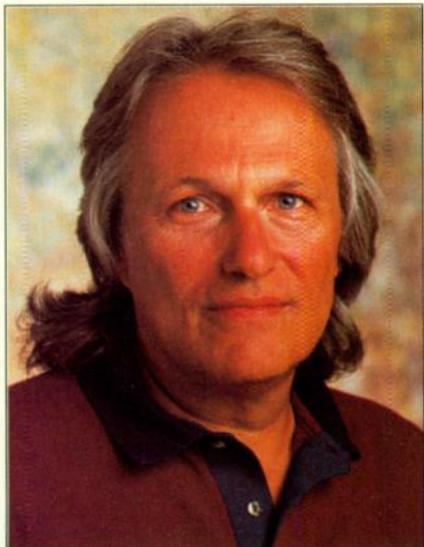
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Xmas Time Again



Three words that sum up
the holiday season:
"Gimme, gimme, gimme"

BY ROGER NICHOLS

I am starting to get annoyed by this Christmas thing. It seems that we just had Christmas about a year ago. I think Christmas should be like the Olympics, or leap year, and come around once every four years. That way people could save up and get me really nice presents instead of socks or underwear. Two pair of each works out fine for me, I can just rotate with the ones in the laundry basket.

Speaking of presents, this is a copy of the list I gave Santa at the mall last week. It would have been longer, but he made me get off his lap:

- Valley People digital-domain limiter.

- Another Yamaha 02R digital recording console, because my wife Connie kyped (ask Steve St. Croix what that means) the one that just arrived.

- A few more GPS receivers.
- Some more Bose ANR headsets, just cause I think they're bitchin'.

- Otari RADAR 24-track hard-disk recorder with the DFC-24 digital routing box with AES cards.

- A dozen Iomega Jaz drives for removable hard-disk storage.

- The new Philips 2X CD-R recorder that has SCSI and AES inputs, and converts DAT start IDs to CD tracks.

- Audio & Design's digital modification for the Yamaha ProMix 01.

- AKG Vintage TL microphones.

- A flock of Alesis ADAT-XT's, now that they are fast and cute and for most functions you don't need a BRC.

- A few Neumann TLM 193 microphones.

- A pair of dbx 1066 stereo compressor limiter expander/gates.

- An Eventide DSP-4000 Ultra Harmonizer.

- Rane PaqRat for storing 20-bit audio to ADAT or DA-88.

- Rorke Data MOD-100 Direct Disk Video Recorder.

- A Fairlight MFX3 24-track digital audio workstation.

- A Sony digital 3-CCD camera for home video recording.

- A pair of HHB's version of the Pioneer D-9601 high-sample rate DAT machines (you need two to be able to make copies).

- A Pinnacle Micro Apex 4.6 GB MO recorder with a truck load of blank discs.

- A Sony DSP-V77 multieffects processor that contains the best of the DSP-M7, F7, D7, and R7 processors in one unit.

- A one-hour shopping spree at Sweetwater Sound in Fort Wayne, Indiana.

- A Whisper Room for doing vocals in my basement.

- A Rimage CD-R label printer for

writing directly on the back of CD-R discs.

- A copy of Opcode MAX MIDI programming software.

- A fruit basket from John Denver (he quit sending them a couple of years ago).

- A 12-gauge polished stainless-steel shotgun to scare off any potential boyfriends of my 15-year-old daughter.

- Seven days in St. Croix (not Steve) with my wife and no kids.

- A Bridge II Nitrox programmable dive computer for mixed gas SCUBA diving.

- A battery that lasts long enough for my Powerbook.

- A gift certificate for Tower Records with no limit. (In 1975 I used to take extra Steely Dan records to Tower Records in L.A. and trade them for other albums, but they don't do that any more.)

- How about a CCS MUSICAM ISDN digital audio interface so I can stay home and listen to mixes?

- A good calendar, diary, and appointment program for my computer.

- Any digital tools to go with my digital tape measure, digital micrometer, digital level, and digital stud finder (how come it always beeps when I put it in my pocket.)

- An ISDN modem for my Mac. Naw, make it a 45 megabit per second T3 connection to my house.

- A one-hour shopping spree at the Sony Store on Madison Ave. in New York.

- An Impulse butane-powered nail gun to finish off the deck in front of my house. This is as close as you can get to a digital hammer.

- A lifetime gift certificate good at any restaurant whose name ends in Jr.

- An Apple Color Laserwriter 12/600 PS. Never mind, I'll probably already have this before this issue goes to print.

- A version of Pro Tools editing software that will let me edit audio at home without having to have a second set of hardware.

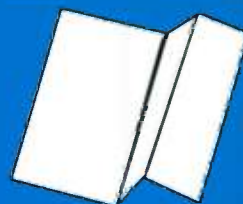
- TOAST CD writing software that

continued on page 129

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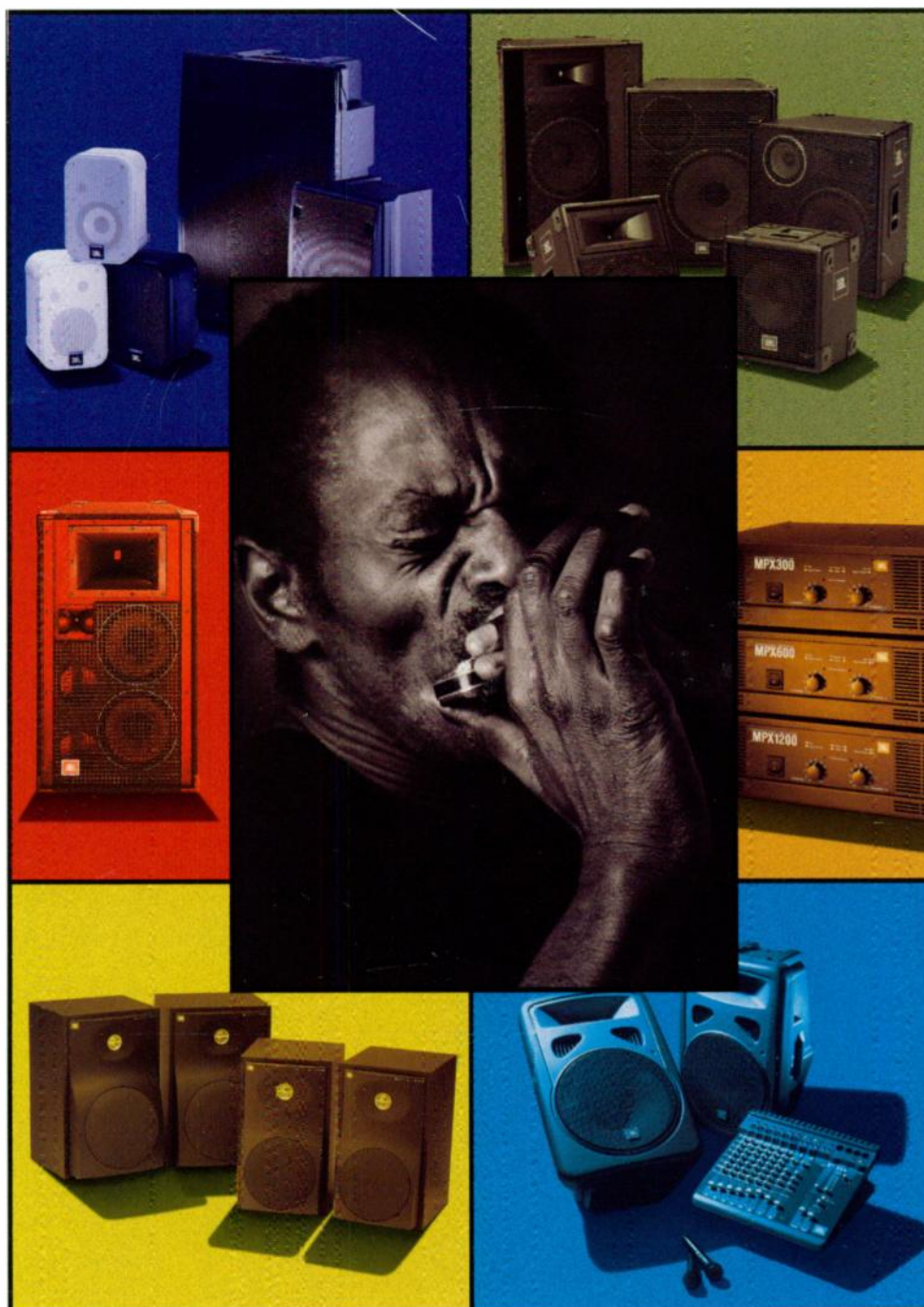
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