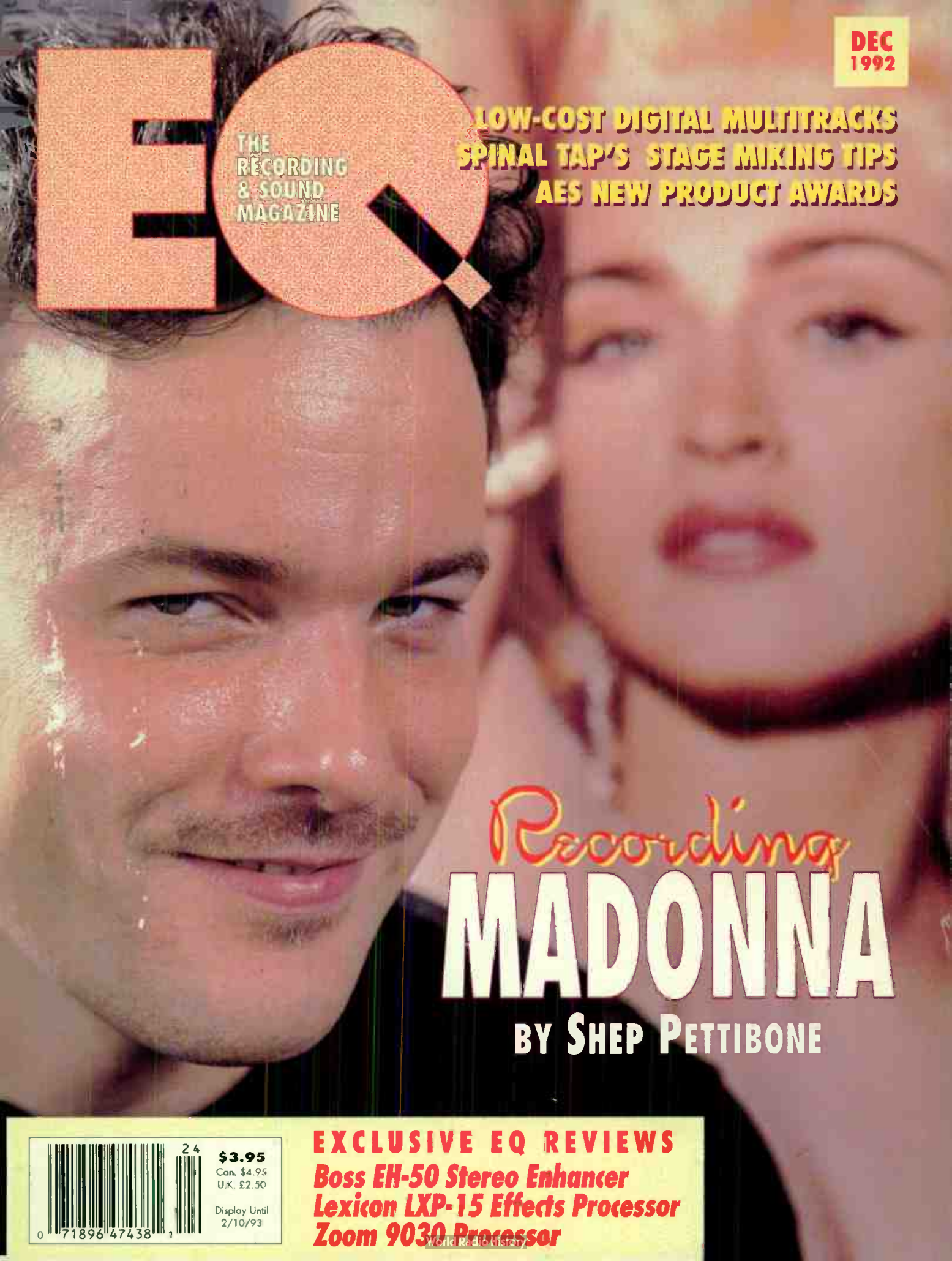

EQ
THE RECORDING & SOUND MAGAZINE

DEC 1992

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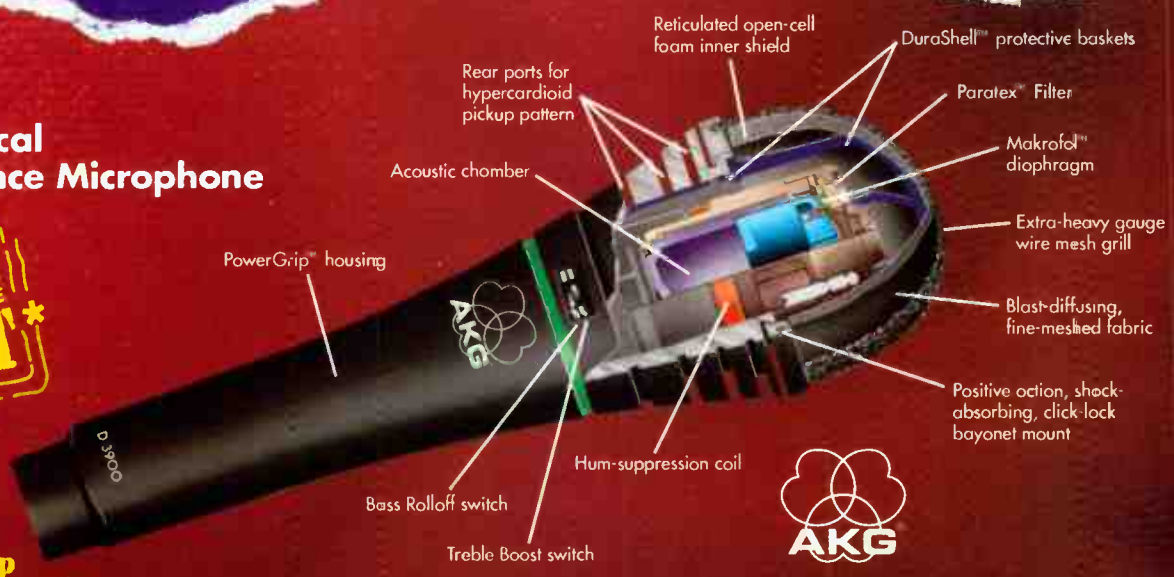


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CIRCLE 02 ON FREE INFO CARD

When you set out to unearth some strange and startling sounds, start with a tape that's truly out of this world.

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As Mark Mangini knows, a quality tape library is the lifeblood of any post sound company. He also knows that with new Sony Pro DAT Plus, life at Weddington Productions is a lot less scary.

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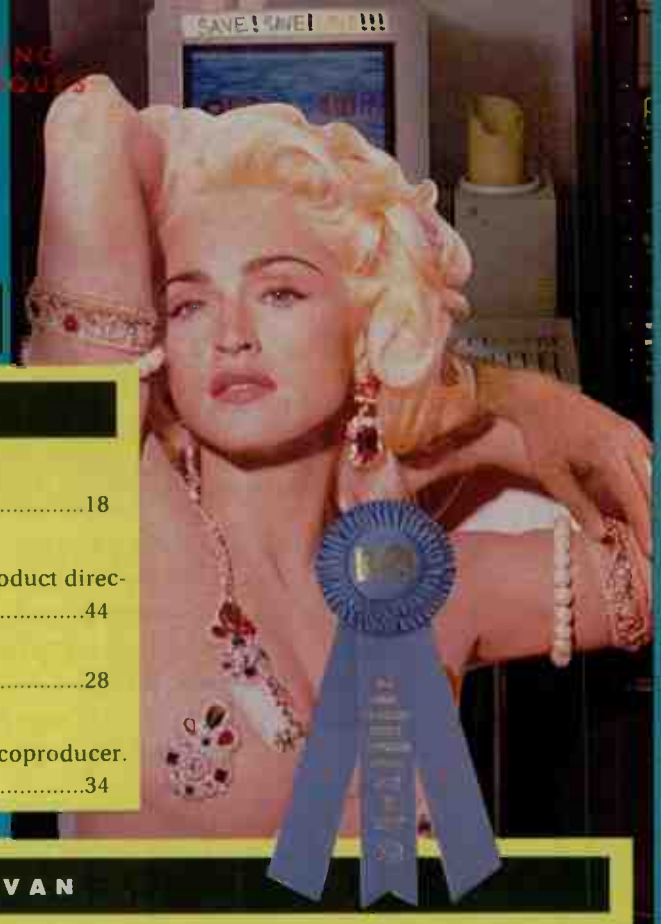
PRODUCT RECORDING & SOUND TECHNIQUES
VOLUME 2, ISSUE 8
DECEMBER 1992

# EQ AES Review



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# EINSTEIN Super 'E'

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- **Compact** size – only 2.15 Metres (85 inches) wide.

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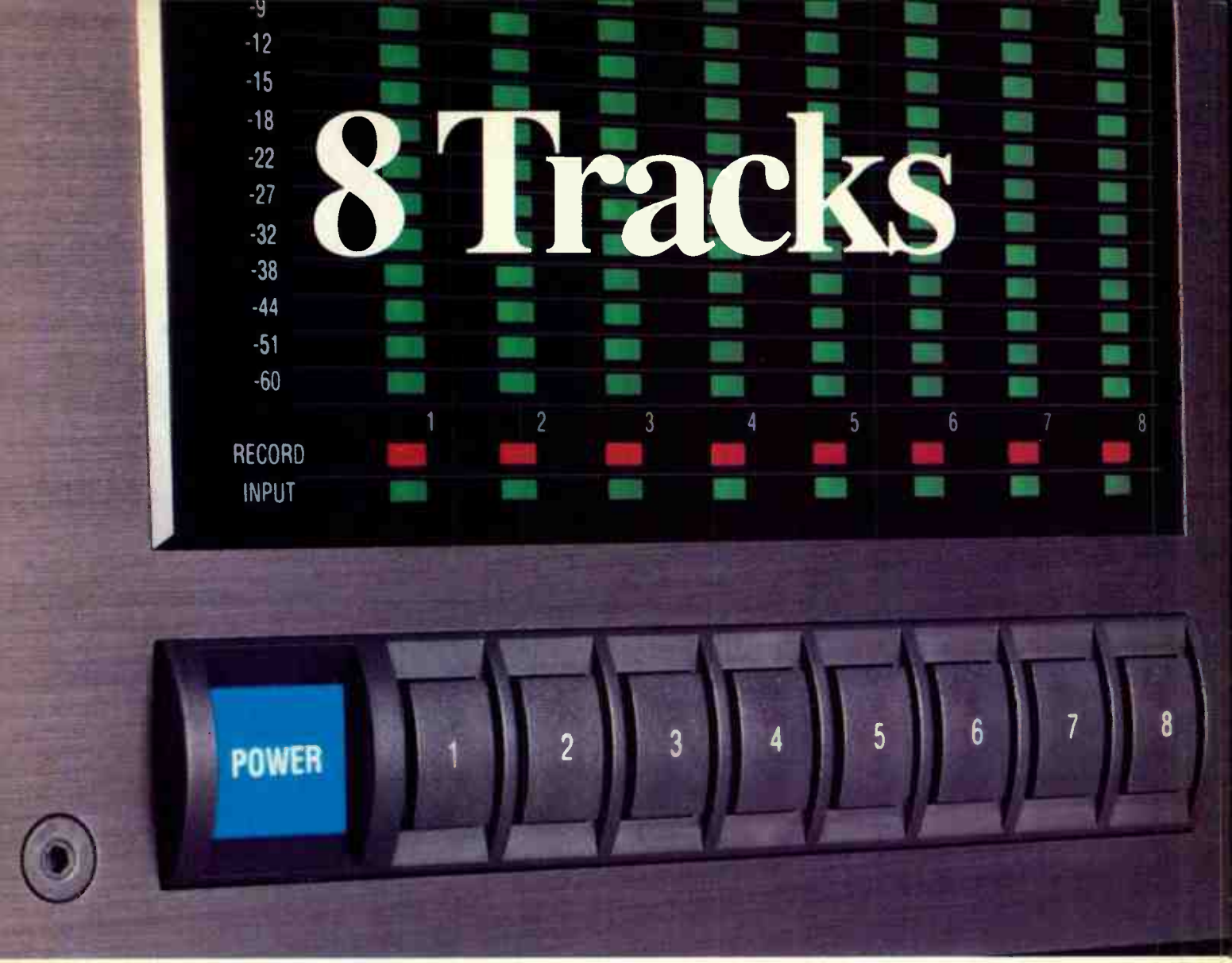


Demos to masters. Creativity to tape. Dreams to reality. Magic phrases for those who want to make music that sounds as good as it feels.

The inspiration for these thoughts is the **Alesis ADAT Professional Digital Audio Recorder**, a technological revolution that tears down the walls to your creativity while delivering world class master recordings. Too good to be true?

Here's the concept. ADAT fuses a supersonic Alesis-designed very large scale integrated chip set with the proven reliability of an industrial grade S-VHS* tape transport and a logical, sensible user interface. The result is a digital tape recording system that exceeds the most demanding requirements of professional audio and that can be used by literally anybody. Hard to believe?

Here's some specs. Bandwidth 20Hz to 20kHz ±0.5dB. Total Harmonic Distortion plus Noise 0.009%. Wow and flutter unmeasurable. ADAT uses the professional standard 48kHz sample rate and delivers better than 92dB dynamic range.

Here's some features. ADAT uses the familiar tape recorder controls that you already know how to use so recording is fast, intuitive, effortless. Connections are provided for balanced +4dBu levels on a single 56 pin ELCO** connector and unbalanced -10dBV signals on 1/4" jacks. And ADAT uses S-VHS tape because it's a proven, robust recording medium with wide 1/2" tape to solidly support ADAT's 8 recording tracks while delivering 40 minutes of recording time.

The best part. ADAT's Proprietary Synchronization Interface (Patent Pending) locks multiple ADATs, independent of the audio tracks, to single sample accuracy ±5% of 1/48,000th of a second! In other sciences this is referred to as 'air tight'. So multiple ADATs function in perfect mechanical and electronic unison: up to 16 ADATs without an external controller. That's 128 tracks!

More best part. ADAT's Proprietary MultiChannel Optical Digital Interface (Patent Pending) simultaneously sends all 8 tracks of recorded information out the Digital I/O for perfect safety tapes and perfect track bounces.

Even more best part. The optional BRC Master Remote Control opens a whole other door to the ADAT miracle. With it you can control up to 16 ADATs (128 simultaneous tracks) with full transport functions, track offsets, machine offsets,

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# To Megatracks

digital assembly editing via the Digital I/O, SMPTE and MIDI Time Code, Video Sync and more.

What does all this mean? Here's just a few benefits.

It's commonly known that many hours are wasted during expensive album projects while the artist, producer and engineer work in vain to reproduce the rhythmic feel and tonal nuance of demos. Demos that couldn't be used because they suffered from noise, limited bandwidth and overall sonic feebleness. Those days are over forever. ADAT's Sync and Digital I/O perpetually link your demos to your masters making them all part of the same creative process. Every track you record on ADAT is a master track that can be flown into any other ADAT recording, at any time. The best part is that ADAT can be there at any time to catch you at your best, flawlessly stored in the digital domain...forever.

Need more tracks? ADAT studios can be expanded at any time. The cost of a single ADAT is remarkably inexpensive and new ADATs can be added as budgets permit. Add the BRC at any time for more control and advanced editing. Producers please note: with ADAT, Megatrack™ recording is a reality.

Your favorite sax player lives in Idaho? No problem. Send 'Supersax' a formatted tape with a guide track of your song. You'll get back 7 tracks of burning solos you can fly back into your production. All in perfect sync, all in the digital domain. All dripping with soul. Want more tracks? Just send more tapes.

ADAT is not only a new recording medium, it is the new recording standard. Imagine a network of ADAT users from bands, composers and project studios to professional studios, video editing suites and broadcast production studios. All recording master quality tracks with full compatibility and no barriers between their creative disciplines. In fact, we're launching the ADAT Worldwide Network™ multitrack recording group to facilitate communication between ADAT studios.

In time we'll all start taking these little miracles for granted. Before that inevitable event, unpack your first ADAT and track a minute of single notes and chords on your favorite instrument. Play loud, play soft. Play it back and listen really close. It's always a good feeling to have your mind completely blown.

See your Alesis ADAT Dealer today and start Megatracking on ADAT.

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CIRCLE 08 ON FREE INFO CARD

EQ

A PSN Publication
Vol. 3, No.5
December 1992

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# LETTERS TO EQ

## CATCH YOUR BREATH

I have been asked to clarify a point that I made in the August 1992 EQ&A, "Floored by Noise."

Briefly, the "breathing" effect that I referred to when using dbx generally stems from an improper user-set record level. I would like to point out that with proper monitoring of one's record levels, dbx is not likely to exhibit this phenomenon. While both dbx and Dolby will "breathe" when record levels are set too hot, it should be noted that, for the less experienced user, Dolby is generally tolerant of such occurrences.

As a matter of good practice, it should also be noted that, since timecode is a steady space signal and will never be present in a final mix, one should generally avoid noise reduction of any type on a sync track.

*Roger Maycock*
*Senior Product Specialist*
*Fostex*

## BREATHLESS

Some generalizations and misconceptions need to be addressed regarding Roger Maycock's comments about noise reduction in the August 1992 issue.

Roger is an employee of Fostex, and Fostex uses only Dolby noise reduction on its analog recorders.

dbx noise reduction offers significantly greater improvement in dynamic range than Dolby C, and it does so across the entire audible frequency range. In fact, dbx Type I Noise Reduction can effectively double the dynamic range of an analog open-reel recorder up to a maximum of 115 dB. This is nearly 20 dB greater than the dynamic range of a compact disc. dbx typically produces an improvement in the overall signal-to-noise ratio of 30 dB, while Dolby C typically offers only a 20 dB improvement and only at higher frequencies. The better signal-to-noise ratio provided by dbx processing allows more bouncing of tracks with less degradation from noise buildup.

dbx uses a 2:1 linear compression/expansion ratio in combination with the carefully tailored high-frequency pre-emphasis/deemphasis circuitry in both the audio path and the control sidechain, in addition to providing greater dynamic range. This full-bandwidth, linear companion design eliminates any possibility of multiband or "spectral" mistracking. It is also immune to mistracking caused by variations in record or playback level settings. dbx processing effectively maximizes available headroom. In narrow format analog recorders such as 1/4-inch 8-tracks, 1/2-inch 16-tracks, etc., maintaining sufficient headroom is as important to a good-sounding result as is the prevention of excessive hiss buildup.

As with most "problem solvers," noise reduction can be used ineffectively. It can be made to "breathe" under certain circumstances, but these are easily avoided. Some dbx noise reduction users also ran into tracking errors in the early days of narrow-track formats when certain dbx-licensed manufacturers built their own systems using components inferior to those in dbx-manufactured units.

Another phenomenon observed by early users was the appearance of "noise tails." These turned out to be the modulation noise of the tape itself — no longer masked by the hiss that used to cover it up. With improved tape formulations and proper biasing, this also ceased to be a significant issue. Any "heavy breathing" you may experience today is likely to be your own, from the excitement of having your recording sound so good!

As to the timecode issue, most multitracks with onboard dbx offer a defeat for the last track (4, 8, 16, etc.) and the dbx outboard units offer bypass for each channel. (There are plenty of anecdotal stories about sessions where someone forgot to defeat the dbx on the timecode track and it worked just fine.)

Which noise reduction system is better? After all is said and done, it really boils down to personal preference. There are no absolutes. (Is a Les Paul better than a Stratocaster?) The questions really are: What is going to work best for your needs? What is the track format? Are you going to do lots of track bouncing? What about compatibility with other machines? What other key features does the machine offer?

## WRITE TO US

EQ wants to dialogue with you. Write to: Letters to the Editor, EQ, 939 Port Washington Blvd., Port Washington, NY 11050. Letters must be signed, and may be edited for clarity and space.

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Many people prefer the added punch and dynamic range that dbx gives their tapes and it is the overwhelmingly dominant system in narrow-format applications.

*Jawxillion Loeb*
*Product Manager*
*dbx Professional Products*

## FLASHBACK

In the AES article by J.D. Sharp in the October 1992 issue of your fine rag, the "Summer Of Love" was improperly attributed to the year 1968, when in fact, it was 1967.

*Linette Wilson*
*Red Star Sound*
*Seattle, WA*

## A HARP, BUT NO ANGELS

Regarding the article "I Had a Secret" in the August 1992 issue of *EQ*: It seems to me that project studio owners should be aware that this selective harassment by the HARP organization may begin with high-profile home studio owners like Chas Sanford, Hank Sanicola, Eddie Van Halen, Steve Vai, and Jay Graydon, but the message to the smaller project studio owners is clear. At some point when you acquire enough recording tracks, outboard gear, prominence, or whatever, you cross the line as far as HARP is concerned, and become "unfair competition."

Your magazine is the forum for home and project studio owners. I truly hope that this issue will continue to be addressed by you and your readers. A good start would be contact information for us Los Angeles readers so we can help put an end to this monopolistic harassment by the HARP organization.

*Alan Wilcox*
*Studio City, CA*

## NOT TO HARP, BUT...

Re: "I Had A Secret," *EQ*, August '92.

Despite the best efforts of HARP's studio membership, there still appears to be a great deal of misinformation regarding its attitude toward home studios. Anybody reading the article in *EQ*'s August 1992 issue might be left with the impression that our association has targeted home studios, such as the one belonging to Chas Sanford. This is not the case.

HARP was set up several years ago to address the changing requirements of our industry, the long- and short-term concerns of the Southern California studio community, and to specifically address the new generation of artist- and producer-owned facilities and the confusion being caused by home studios "for hire."

At that time, the association was of the opinion that project studios would work in liaison with commercial studios on certain portions of their projects, and not rent out their facilities "for hire."

Let's be very clear on this very important distinction: A number of artists, producers, and engineers own recording equipment, that is installed in their home or garage, and intended for use on their personal projects. Such facilities are an essential part of the creative process of making music. They allow artists, bands, and their producers to develop ideas or to record portions prior to coming to a commercial facility for tracking and/or mixing.

What HARP does have a problem


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with, however, are the home studios that are hired out for projects as if they were *commercial* facilities. HARP members feel that it is important for all commercial studio businesses to compete on equal terms. We achieve this equality through city, state, and federal business law guidelines and local zoning laws. What HARP has *never* done, however, is to report owners of home studios to any authorities. Our style is based on persuasion rather than on confrontation.

As to the specifics of the Sanford case, the truth is far more boring than the fiction presented by Sanford in *EQ*. In 1989, having printed some very nice-looking, four-color brochures for his Secret Sound Studio, Sanford distributed them in various locations — including a commercial recording studio. A brochure was eventually shown by an independent studio owner to a representative from the L.A. Building and Safety Dept., which enforces zoning laws. Chas was subsequently visited by a representative of that department, to whom he explained that he only used his 24-track facility for personal use.

When the time came to sell his property in early 1992, Chas Sanford apparently discovered that California's real-estate disclosure laws required that he reveal the presence of a business — a recording studio. He then contacted the zoning department to request a zoning variance to operate a commercial business on residential property (which, incidentally, would increase its sales value). The department held a hearing (which is a matter of public record) and his request was denied.

Because Chas Sanford had originally claimed that Secret Sound was for his personal use, then requested a zoning variance to reclassify the studio as a business, the Building and Safety Dept. revisited his property. They allegedly then issued a cease and desist order regarding his studio operation. HARP had nothing to do with these events.

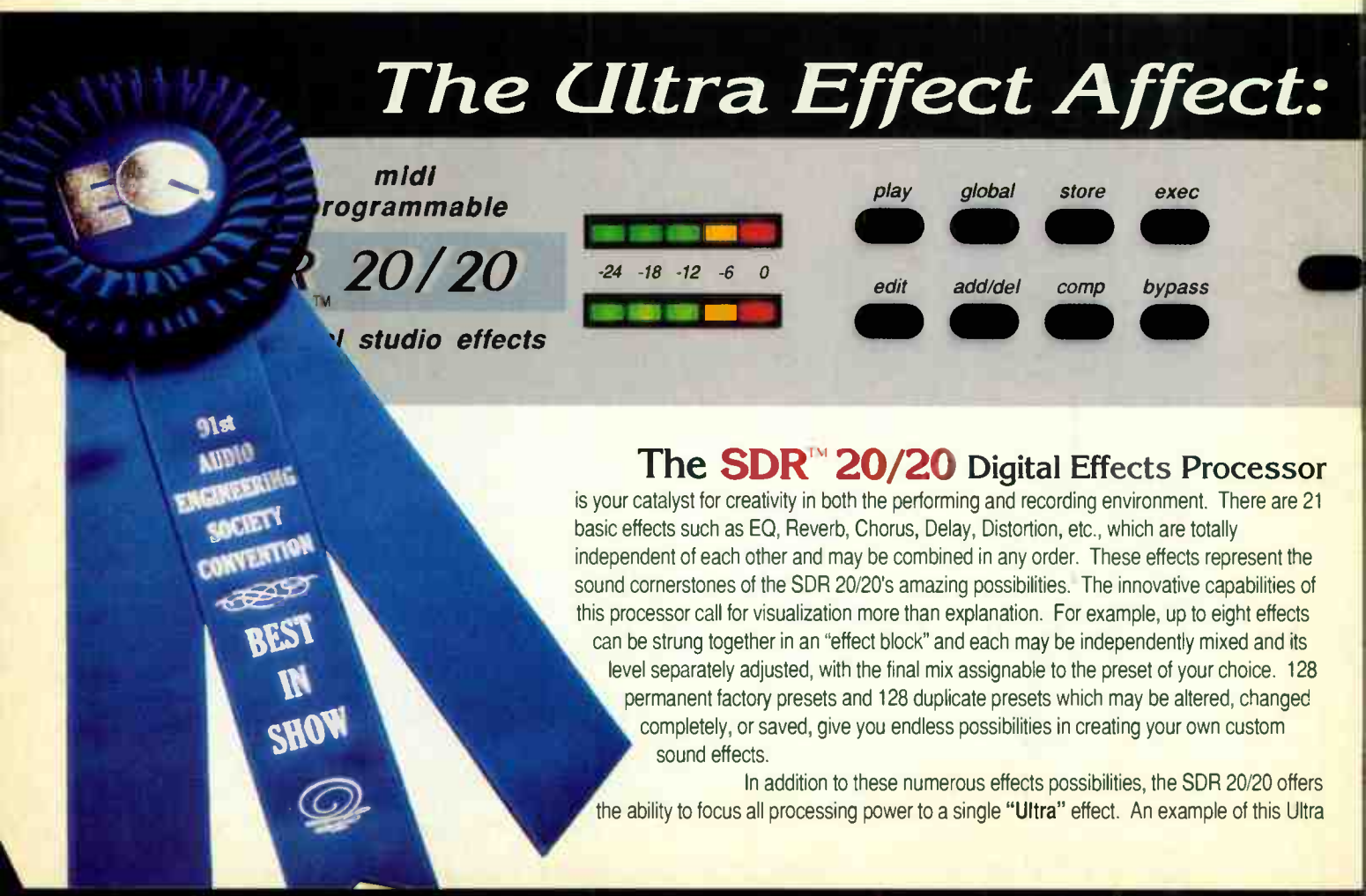
Specifically, HARP's position on the role of home studios is simple: Our association has strong objections to home studios being offered for hire by their owners. City zoning laws are implemented to prevent residential areas from being inconvenienced by the noise, disturbances, and extra traffic that's normal for business areas. Also, commercially-zoned facilities contribute to a city's day-to-day operating costs through levies, taxes, and various physical obligations imposed upon them.

It's time to play fair. Commercial studios, by their very nature, can have a substantial impact upon a residential area. Zoning laws were developed for a purpose: to prevent commercial activities within a residential setting. Despite the paranoid rumors being circulated by individuals such as Sanford, HARP simply wants the playing field to be leveled; we do not intend to put the competition out of business.

In fact, HARP has been very active in addressing the day-to-day needs of the California recording community. Lack of space precludes mentioning more than a few of our recent achievements:

• Developing a common ELCO connector standard, now being used by all major studios and rental companies.

• Offering technical seminars and demonstrations from major equipment


The SDR™ 20/20 Digital Effects Processor is your catalyst for creativity in both the performing and recording environment. There are 21 basic effects such as EQ, Reverb, Chorus, Delay, Distortion, etc., which are totally independent of each other and may be combined in any order. These effects represent the sound cornerstones of the SDR 20/20's amazing possibilities. The innovative capabilities of this processor call for visualization more than explanation. For example, up to eight effects can be strung together in an "effect block" and each may be independently mixed and its level separately adjusted, with the final mix assignable to the preset of your choice. 128 permanent factory presets and 128 duplicate presets which may be altered, changed completely, or saved, give you endless possibilities in creating your own custom sound effects.

In addition to these numerous effects possibilities, the SDR 20/20 offers the ability to focus all processing power to a single **"Ultra"** effect. An example of this Ultra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vendors and improving relationships between studios and manufacturers through special forums.

• Setting up a central tape-purchasing account for association members, offering substantial discounts.

• Conducting a review of Workman's Compensation with California's rating bureau, to establish a separate, lower-rated category for recording studios.

• Creating a set of standard guidelines for booking and client relations, plus documentation standards for sessions.

• Establishing dialogs with record companies to help redefine bookings and PO processes.

• Setting up a scholarship fund for student engineering education.

• Forging stronger links with SPARS and England's APRS (Association of Professional Recording Services), to serve the international interests of studio clients.

With my having taken the time to redress the balance of negative publicity directed against our association, I'm sure *EQ* readers will better appreciate the wide scope of HARP's interrelated activities. You can contact HARP at 8033 Sunset Blvd., Suite 89, Los Angeles, CA 90046. Tel: 213-655-2452.

*Teri Piro*
*President*
*HARP*

## UP IN THE SKY! IT'S A...

Regarding David Jacobs's "Flying Trapezoids!" article in the October issue of *EQ*, I was concerned about the impression that the article left me with. Although I do not think it was the author's intent, the article seemed to imply that all trapezoidal loudspeakers can be flown. Nothing could be more false.

A loudspeaker manufacturer must provide many safeguards — both internally and externally — to build a flyable loudspeaker enclosure, whether it is trapezoidal or rectangular. A complete flying loudspeaker system includes internal bracketing, external rigging components, and a structurally designed enclosure; all of which must meet at least a 5:1 design factor when tested.

My concern regarding the article stems from the fact that the readers of *EQ* might not be schooled in rigging and the physical universe. If just one reader thinks that all trapezoids are flyable and attempts to fly a low-grade unflyable loudspeaker because of its trapezoidal shape, and that loudspeaker then falls and injures or kills someone, the professional rigging community would be in serious trouble.

Rigging is not an easy profession. Anything being placed over the heads of people should be done only by trained and qualified rigging personnel.

*Andrew T. Martin*
*President*
*ATM Fly-Ware*
*Carson, CA*

## CORRECTION

On page 42 of our last issue (October 1992) we incorrectly listed the name of Lindsey Buckingham's console. It should have read "Neotek Elite."


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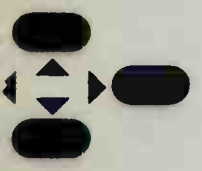

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# EQ TIPS

EDITED BY DAVE BRODY

## RUSHIN'/DRAGGIN'

When you are doing drum replacement, the Russian Dragon timing accuracy meter can help you line up a triggered drum sample with the old drum on tape. You feed the old drum into Russian Dragon Channel One (the reference signal input) and the drum sample into Channel Two. The LED display tells you if the sample is "rushin'" or "draggin'" compared to the old drum. But there is a bit of confusion about whether or not the LED display of the Russian Dragon is calibrated — in other words, about whether the LEDs indicate a specific amount of timing error.

Well, here's the scoop: The Russian Dragon *is* calibrated, so the user can tell immediately how many milliseconds off the two sounds are. The confusion seems to have arisen from a knob on the older models, that is called the "WINDOW" control. This knob adjusts the time sensitivity of the LED display in milliseconds per LED. If the knob is set on "4" and the 7th LED on the draggin' side is lit, the Russian Dragon is indicating that the new sample is 28 milliseconds late compared with the old drum.

You then move the sample (by shifting in a sequencer, offsetting using SMPTE, using a digital delay, etc.) to get rid of the 28-millisecond error. Keep tweaking the position of the sample until the Russian Dragon indicates that it is in perfect sync with the old drum. The two sounds are now aligned to an accuracy of .1 millisecond.

*Marius Perron*
*Chief Engineer*
*Jeanius Electronics*

## ROCKIN' THE REELS

For those of us who haven't gotten our mitts on a Russian Dragon yet, there's still a highly accurate — albeit slower — way to correct trigger-timing problems. Let's say you're doing a drum replacement (as in Marius Perron's tip, above) on a multitrack format. Record about 20 seconds or so of the replacement sample on a separate track. Rewind to the first hit. Now advance the tape by hand as if you are marking an edit point. Manually move the tape back and forth over any spot where the original drum and its new replacement live. (This time honored operation is called: "Rockin' the Reels," "Scrubbing," "Jogging," "Skwudging," or [in Milspec-speak] "Signal Acquisition and Zero-cross Locus Verification.") Watch your track meters and see who hits first. It may be helpful to solo these two tracks (or mute everything else) and pan, say, the old track left and the new track right. This allows you to use both eyes and ears to scope out who's rushin' and who's draggin'.

You can now "guesstimate" what SMPTE offset, sequencer tick-shift, or delay product you need in order to bring your replacement sample into sync. You can do this by trial and error (it usually takes a surprisingly small number of whacks to get it right). Or, if you're working in reel-to-reel tape, you can get very close on your first try by actually measuring the misalignment. Mark the hit points of both original and replacement with a grease pencil as if you were about to perform a physical tape edit. Measure the distance between marks. Divide by the tape speed and convert to milliseconds, clockpulses or frames and subframes — depending upon what box you're using to tweak your sync.

It is often a good idea (and, indeed, has become standard procedure in many studios) to record a quarter- or eighth-note click on a separate track as an absolute time reference even when working with carbon-based performers rather than silicon-based ones. Comparing to click by rockin' those reels can get you into the sync ballpark very quickly. EQ

Tap out those tips to:
EQ Editorial Offices,
939 Port Washington Blvd.,
Port Washington, NY 11050



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3. Nobody tries to mix without it
4. I already own 3 and need 1 more
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6. Stereo in and Stereo out
7. Incredible MIDI implementation
8. Does up to 5 effects at the same time
9. Incredibly quiet
10. Great Dynamic range
11. Vocals sound incredible with Quadraverb
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14. My boyfriend won't let me mix without it
15. My producer won't let me mix without it
16. It works as well on stage as in the studio
17. 16 Bit Linear conversion
18. It's easy to program
19. It's easy to hook up
20. It works great in my MIDI system
21. It works great in my guitar rack
22. It works great with my bass rig
23. My flute sounds better through it
24. 20Hz to 20kHz Bandwidth
25. 127 MIDI sources can modulate any of 57 parameters
26. Works great in any country
27. You can take it on cruise ships
28. Everybody in Hollywood thinks it's cool
29. They use it back East
30. They use it out West
31. The North and South think it's great
32. Affordable enough for demos
33. Perfect for masters
34. It will be with you throughout your career
35. Those cute buttons with the little lights
36. Pressure sensitive programming buttons!!
37. The chorus is unreal
38. Reverb + chorus Programs are awesome
39. Pro engineers can't believe it's so inexpensive
40. They've got one in every room where I rehearse
41. I need one in my rack and one at home
42. The vocals stunk until I added the Quadraverb
43. Instant vocal doubling – chorus + reverb + eq
44. My guitar finally has a voice
45. 20 Bit processing
46. Incredible resolution for perfect reverb tails
47. It sings
48. Fills in the cracks of my keyboard
49. It's like a synthesizer for processing
50. There's no better reverb
51. The multitaps are unbelievable
52. You can delay up to 1.5 seconds
53. With everything on, there's still 800ms of delay
54. The price is unbelievable
55. All Alesis reverbs are great
56. It makes my drum machine sound real
57. It was the finishing touch on my demo
58. ...and my demo got me a deal
59. It's great to borrow, but better to own
60. I ate at night under headphones I leave the planet
61. My mixes sound like movies
62. My speakers sound bigger
63. Close your eyes and you're there
64. For a successful music career
65. For birthdays
66. For Christmas
67. The auto-panner is great
68. Michelangelo would have used one
69. It gives me new keyboard sounds for free
70. It's so musical sounding
71. It's as wet as you can get
72. Use as much as you like
73. The resonators are great for guitar
74. The ring modulators are great for sci-fi
75. The sampling is a cool convenience
76. You can automate parts of your mix
77. It's a necessity
78. The specs are great
79. It makes my ears feel better
80. It makes A & R departments hear better
81. I'd be lost without it
82. I don't need it at the beach...but I might
83. It's the first thing ON in my studio
84. It's the last thing OFF
85. I love Alesis
86. Alesis loves me
87. It does 24 million instructions per second
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92. It only weighs 4.5 pounds
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99. It looks great in a rack
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# EQ&A

## COPY CAT

*Q I have a Tascam DA-30 DAT. It sounds great, the price is right, and it's been a great addition to my studio. I'm very disappointed, though, that as a pro deck, it includes the Serial Copy Management System (SCMS). Is there anything I can do about this, short of buying an outboard box?*

*Eva Trautler*
*Seattle, WA*

A If you're willing to void the warranty, and have the necessary technical competence, you're covered. Unplug the DA-30, remove the top cover, and locate the wire jumper labeled W-402 (looking at the DA-30 from the front, this jumper is toward the left front of the large, green circuit board to the right of the transport). Snip the jumper with a small diagonal cutter, replace the top, and you're done.

The Tascam User Guide, issue #8, describes this modification in more detail on page 22. For back issue information, contact Tascam at 7733 Telegraph Rd., Montebello, CA 90640 or call (213) 726-0303, ext. 634.

Craig Anderton
West Coast Editor
*EQ*

## MIDI THRU AND THRU

*Q I'm making a MIDI thru box but can't find a good source for PC-900 opto-isolators. Jameco has them, but requires a $30 minimum order. Is there an equivalent, more common part?*

*Also, I'd like to see the standard interface MIDI circuit described in the original MIDI 1.0 specification; where can I find this?*

*J.D. Brown*
*Afton, TN*

A The HP 6N138 opto-isolator can substitute for the PC-900. The 6N138 is available for $1.45 from Digi-Key; tel: 800-344-4539. They have no minimum order, but there is a $5 handling fee for orders under $25.

The IMA (International MIDI Association; tel: 310-649-6434) sells the detailed MIDI 1.0 spec ($25 to members, $40 for nonmembers) as well as supplements to the spec (Standard MIDI Files, MIDI Machine Control and General MIDI; prices range from $7 to $25). The original MIDI 1.0 spec is also reprinted in *MIDI For Musicians* (AMSCO Publications, a division of Music Sales).

Craig Anderton
West Coast Editor
*EQ*

## NAMM-SKULL

*Q In the article "Apocalypse NAMM Revisited" [EQ, April 1992, p. 26], you mentioned Marion Systems in the "Annual NAMMINATIONS" sidebar. Could I get the location of this company, which offers a SCSI hard-disk interface for the AKAI MPC-60 and MPC60-II?*

*Floyd Adams III*
*Compusult Percussion*
*Copenhagen, Denmark*

A Marion Systems is run by synthesizer pioneer Tom Oberheim, and is located at 1078 Carol Lane, Suite 200, Lafayette, CA 94549; tel: 510-283-4631, fax: 510-283-6882. The SCSI hard-disk interface is compatible with both versions of the MPC60 and sells for about $295.

Craig Anderton
West Coast Editor
*EQ*

## GRABLE'S CABLE STABLE

*Q I have been tying my cables in knots for years. Is there a better way to bundle them? I have tried a few of the cable-tying systems that I've seen adver-*

This is where your questions get answered. Send your query with your name and address to:
EQ Editorial Offices,
939 Port Washington Blvd.,
Port Washington, NY 11050
Fax: 516-767-1745



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*tised and found each of them to be either a pain or too expensive to use on the large number of mic cables I now own. How can I tie up all these cables without taking out a loan?*

*Bob Grable*
*Wilkes-Barre, PA*

A There are many ways to bind cables for storage between gigs. The problems of fastening mic or adapter cables for storage in the road box or on the cable peg require a solution that will create a neat bundle, bind quickly and snugly, stay with the cable without getting in the way, be reusable, and, lastly, be cheap to buy.

I also have tried many of the systems around and I didn't find any that solved all of these problems until I discovered spiral wrap. This stuff is a flat, fairly thick PVC that has been formed into a spiral tube (such as Alpha SW-13, which is available from Alpha Wire Corporation, Elizabeth, NJ; tel: 201-925-8000). It comes in a number of sizes and is intended to be used over the length of a set of cables to create a neat harness that remains flexible. Instead of using the stuff in long sections, I cut the 1/2-inch-diameter spiral wrap into two-inch pieces. They will then wrap two or three times around a coiled 25-foot mic cable. The longer the cable is, the longer the piece of spiral wrap for tying it up. Small diameter cables and short adaptor cables can be tied with smaller diameter spiral wrap tubing.

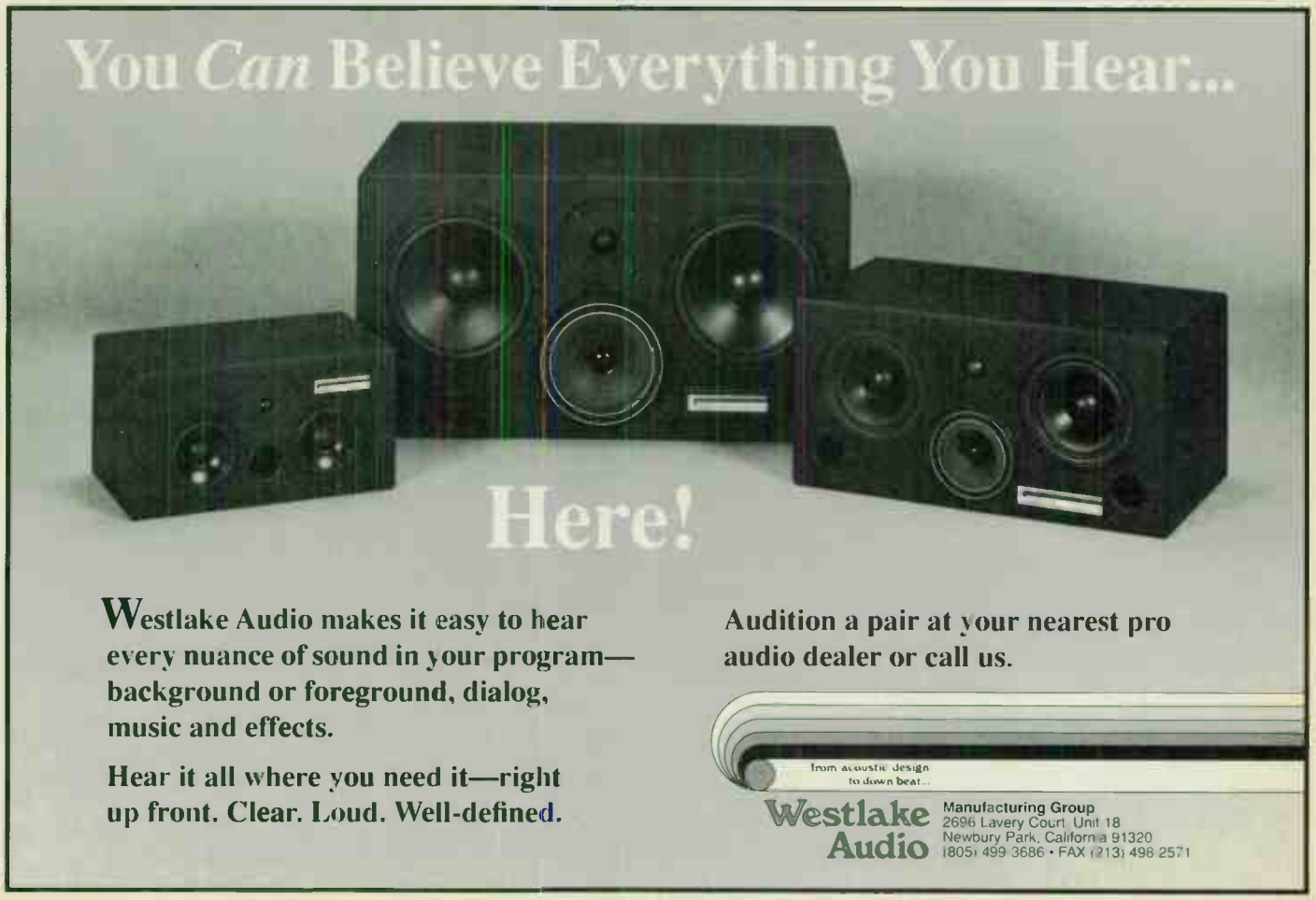
If you like to store cables in a box instead of on a peg, then it might be better to wrap the coiled mic cables across the coil, ending up with figure eights, as these are easier to separate than coils once the box has jiggled around in a truck for a few hundred miles.

When using a cable, the spiral wrap can be twisted back onto one end of the cable and you will then have it at hand when you go to pack up! You can also use spiral wrap to create instant mic snakes by binding a group of mic cables together, such as from the drum kit to the stage box for a three week tour. Label each cable connector, and the ends will come out to the right place every night. At the end of the tour, the mic snake breaks out to ordinary mic cables.

Once you are used to wrapping these onto your cables, it's as fast as gaff tape and over the course of a few months, considerably cheaper — all without leaving goop on those cables that haven't been used in six months. It will also avoid the sharp bends in your cables produced by tying them in knots and it will not catch on everything as velcro fasteners can. Plus it can go into your pocket, someone else's pocket or on the floor during set up like many plastic cable ties.

You can buy spiral wrap at most electronic wholesalers by the foot. Buy a few feet in a few different sizes and try it out. I prefer the black version, but it also comes in translucent white. It must be cheap to use because I haven't seen anyone with his or her sound company's logo printed on it, yet.

Wade McGregor
*EQ*

## MARK OF THE ADAT

**Q** *Can the ADAT be synched to Mark of the Unicorn's Performer (or vice-versa) using ADAT's internal SMPTE without recording a SMPTE track? Also, the ADAT has -10 inputs but the +4 inputs are replaced by a 50-plus pin connector. What's the connector for and how would I connect my console to the +4 inputs?*

*Michael Hammar*
*Heart Music Productions*
*Hsin Chu, Taiwan*

**A** To synchronize Performer to the internal SMPTE of the ADAT, you will also need Alesis' BRC remote control as this is the only place to get SMPTE in and out of the system. You can take the SMPTE in and out of the BRC to your MIDI Time Piece (or whatever SMPTE converter you are using to slave your computer).

The ADAT uses a straightforward multipin connector for its +4 I/O. To connect to the +4 I/O of the ADAT, you could build a snake with a 50-pin connector on one side running to a patchbay or mixing board with separate connectors for each channel. Alesis uses this multipin to save space on the back panel and to keep the cost of production down.

Daniel Rose
Mark of the Unicorn, Inc.

## GETTING ON THE QT

**Q** *I've heard a lot about the QSound process. How does it work?*

*Peron Nilton Rarez*
*Belo Horizonte, Brazil*

**A** QSound is a proprietary virtual sound localization process for the production of stereo program material, e.g., audio-for-video games, film soundtracks or recorded music. QSound makes it possible for the listener to perceive discrete virtual sounds within a mix as being outside the normal stereo field.

At its core, QSound is a process that takes mono inputs and, from them, produces stereo signals encoded in such a way that the listener will perceive the selected placements (virtual images), when on axis, as being unrelated to the playback speakers. This enlarges the sound field to a 180° arc in front of the listener. As a bonus, encoding produces enhanced separation and clarity for the off-axis listener as well. No special decoding equipment is required, and the encoded signal may be broadcast or reproduced in any stereo format.

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For further information contact: QSound Ltd., 7551 Sunset Blvd., #201, Los Angeles, CA 90046; tel: 213-876-6137.

Scott Willing, CET
Field Support Supervisor, QSound


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# THE SECOND ANNUAL

The show is over, but far from done. Our editors and contributors tirelessly walked the floor in search of the most impressive new equipment upon which to bestow our coveted Blue Ribbons. We may have had a little fun with the award names, but each of these products proved to represent the future direction of the professional audio industry.

They have not been arranged in any particular order, although before we begin we would like to give the city of San Francisco an honorary "Great Place To Hold An AES Show" Award because its musical history and many scenic locales provided a very stimulating atmosphere.

## THE UNPLUGGED AWARD

### TO THE RANE MAP 33 MIDI/PROGRAMMABLE INSTRUMENT PROCESSOR

The MAP 33 MIDI/Programmable Acoustic Instrument Processor from Rane accurately reproduces acoustic instrument timbres onstage with flexibility, power, and minimum feedback. The MAP 33 utilizes a multipickup approach (usually mic and piezo) with separate programmable 7-band equalization, and with notch filtering, band limiting, and level controls for each pickup. The MAP 33 is extensively outfitted with additional functions, such as separate Vocal Mic input with its own programmable EQ and level; a separate Monitor output with dedicated 7-band EQ and individual mix of vocal and pickups (all programmable); balanced stereo master outs with noise gates; stereo line inputs for tape or drum machine; several insert loops; foot pedal inputs; and much more. Retail price for the MAP 33 is $1995. For more information, contact Rane Corporation, 10802-47th Avenue West, Mukilteo, WA 98275-5098. Tel: 206-355-6000. Circle EQ free lit. #101.

## THE PAVAROTTI AWARD

### TO EVENTIDE'S DSP4000 ULTRA-HARMONIZER

Eventide's new DSP4000 Ultra-Harmonizer® features AES/EBU digital I/O for all-digital signal manipulation, and a unique modular software architecture. You can build your own algorithms by linking modular effects "building blocks." The DSP4000 will generate up to eight simultaneous voices of pitch shifting plus simultaneous stereo reverb. A unique Effects Segue feature provides smooth transitions between presets. For more details, contact Eventide, Inc., One Alsan Way, Little Ferry, NJ 07643. Tel: 201-641-1200. Circle EQ free lit. #102.

## THE NEW CONTENDER AWARD TO

### ATARI'S FALCON030 COMPUTER SYSTEM

The Atari Falcon030 computer is the first personal integrated media (PIM) system. Features include: Atari's Graphic Environment Manager (GEM); standard-equipped MIDI input/output ports; 16-bit stereo sound at sample rates up to 50 kHz; and external video sync for high quality genlocking. You can record on two stereo tracks and add graphic equalization and audio special effects such as surround sound, harmonizing, reverb, and echo. Prices start at $799 with 1 MB of RAM, and units are scheduled to ship the first of the year. For more information, contact Atari Computer Corporation, 1196 Borregas Avenue, Sunnyvale, CA 94089-1302. Tel: 408-745-2000. Circle EQ free lit. #103.



World Radio History

# EQ BLUE RIBBON AWARDS

## THE UNITED NATIONS AWARD

### TO THE ROLAND SRC-2 DUAL SAMPLE RATE CONVERTER

Roland Pro Audio/Video Group introduced the Dual Sample Rate Converter. The SRC-2 provides a variety of digital conversion and mixing features. It enables mixing two stereo digital signals at different sample rates into one stereo digital output at any selectable sample rate, with balance and overall level control. Features include AES3 (XLR), IEC 958 (coaxial), and EIAJ CP-340 (optical) inputs and outputs. The device allows for any incoming sample rate between 30 kHz and 52 kHz. Selectable output rates of 48.048 kHz, 47.952 kHz, 44.1 kHz, 44.056 kHz, and 32 kHz are provided. Sync sources include House Sync 30, House Sync 29.97, House Sync 25, Word Clock, Internal Clock, and Input A. In addition there is full 24-bit AES/EBU implementation for optimum real-time sample rate conversion. The two digital inputs and one digital output, each selectable between AES/EBU Professional Format Type I (XLR) and IEC 958 Consumer Format Type II (coaxial or optical), allow you to mix two different sample rates together. The SRC-2 will automatically deemphasize any incoming signal that has been preemphasized. In addition, there is metering for L and R channels and a digital "CLIP" indicator for inputs and outputs with two output modes, "Real Time" or "Peak Hold," with manual reset. The SRC-2 retails for $2595. For the full story, contact Roland Pro Audio Video, 7200 Dominion Circle, Los Angeles, CA 90040-3696. Tel: 213-685-5141. Circle EQ free lit. #104.

## THE 8 IS ENOUGH AWARD

### TO THE TASCAM EIGHT-TRACK DIGITAL RECORDER

Tascam's DA-88 is an 8-track digital recorder that records on Hi8 tape. It has the capability of recording up to 100 minutes on a standard 120 tape at either 44.41 kHz or 48 kHz, with a variable pitch of 6 percent up or down. Up to 16 DA-88 units can be locked together by connecting a simple 15-pin D-sub connector between units. Word sync I/O utilizes two BNC connectors and Digital I/O uses a 25-pin D-sub connector for easy copying of tracks from one machine to another. Options include the SY-88 Synchronization Board for SMPTE syncing as either master or slave without requiring the striping of an additional track, a remote controller, and an expanded, remote meter-bridge. To get on track, contact Tascam, 7733 Telegraph Road, Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #105.

## THE ADD IT TO MY TAB AWARD

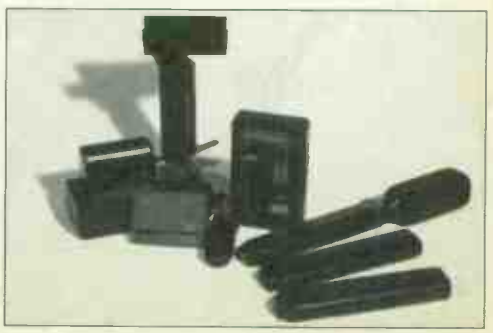
### TO FOSTEX'S DCM-100 DIGITALLY CONTROLLED MIXER AND MIXTAB™ CONTROLLER

The MIXTAB controller and DCM-100 mixer from Fostex have been designed as two discrete units which fully interact to form a complete MIDI-controllable mixing system. The DCM-100 is a 1U rack-mountable mixer that is entirely controlled via MIDI messages. The MIXTAB is the human interface to the DCM-100. The MIXTAB can store up to 100 settings in a "snapshot" memory — all of which can be accessed by a simple MIDI Program Change Message. For the full story, contact Fostex, 15431 Blackburn Ave., Norwalk, CA 90650. Tel: 310-921-1112. Circle EQ free lit. #106.

## THE SWISS ARMY DAT AWARD

### TO JVC'S XD-P1PRO DAT MACHINE

JVC's XD-P1PRO is the world's smallest DAT recorder. The main unit is about the size of a DAT cassette box and features JVC's servo driven "Compressed M" loading mechanism. Its modular design allows it to be used with either a snap-on A to D converter or digital output microphone module. Recordings can be made SCMS free through digital or analog sources at any sample frequency from mic, line or digital port. Flexible mini jack splitters are provided for unbalanced analog and digital inputs and outputs. For more information, contact JVC Company of America, Customer Relations Dept., 107 Little Falls Rd., Fairfield, NJ 07006. Tel: 800-252-5722. Circle EQ free lit. #107.



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# THE SECOND ANNUAL EQ BLUE RIBBON AWARD

## THE TIME FOR A CHANGE AWARD

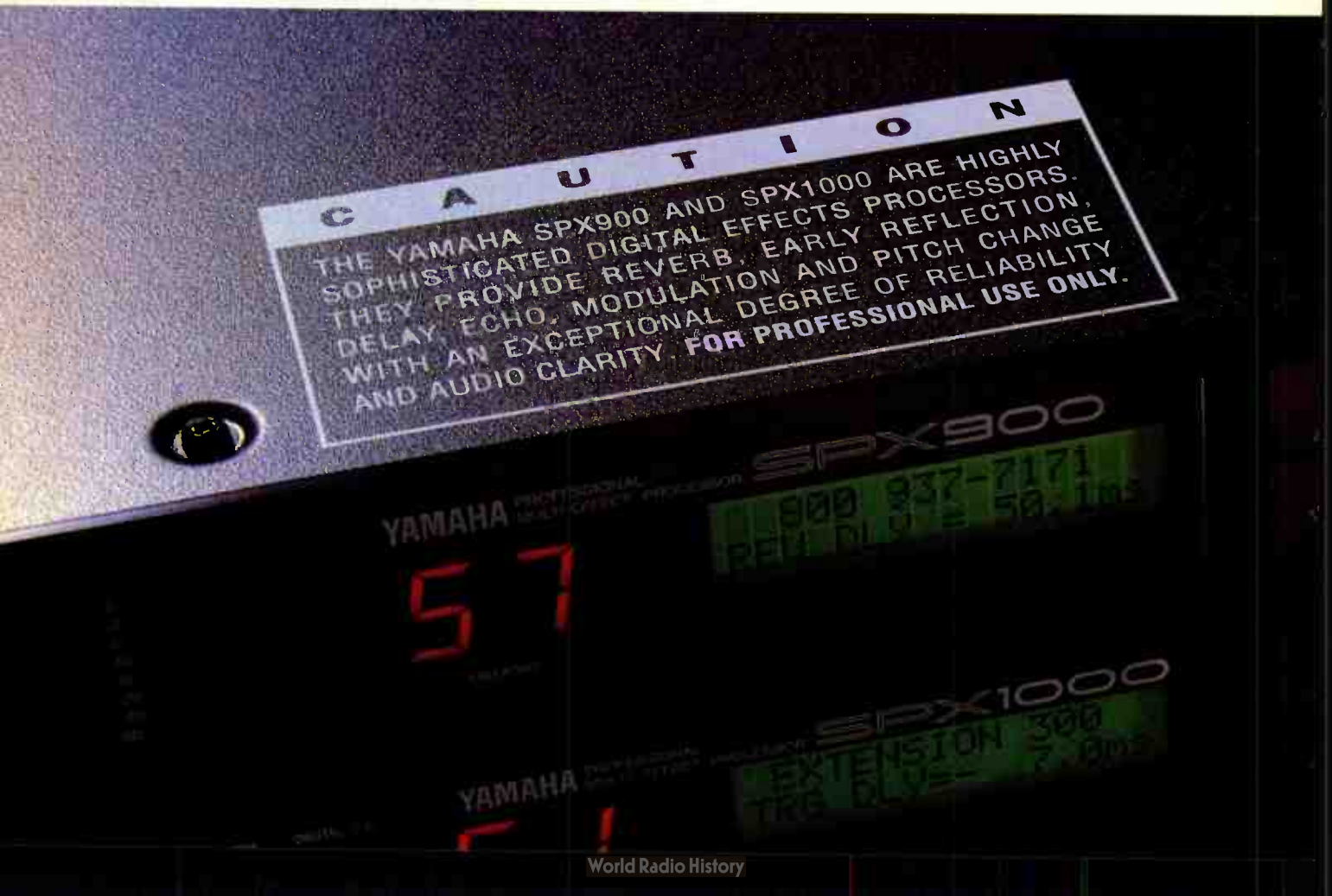
### TO THE ZOOM 9200 ADVANCED REVERBERATION PROCESSOR

The new ZOOM 9200 Advanced Reverberation Processor has a flexible architecture that is quickly and easily configurable to a variety of applications. The 9200 features 31 effect templates, with deep parameter adjustments that allow for virtually infinite effects possibilities. Up to 297 programs are available at any given time. Twelve quick control buttons and a large detented edit dial enable fast editing. The front panel's 99 program RAM/ROM card port makes archive and retrieval easy. The +4, XLR back panel is designed for professional interface. For more information, contact ZOOM Corporation, 385 Oyster Point Boulevard, Suite #7, South San Francisco, CA 94080. Tel: 415-873-5885. circle EQ free lit. #108.

## THE ACE IN THE HOLE AWARD

### TO THE ALESIS BRC MASTER REMOTE CONTROL FOR THE ADAT

The BRC Master Remote Control for the Alesis ADAT 8-track digital recorder is an important peripheral because it delivers ADAT's full potential — digital multitrack recording, remote control, and editing. The BRC gives you the required comprehensive remote control of the tape transport and editing capabilities. The BRC provides precise access to the digital data stream of each track in an ADAT system. When connected, the BRC automatically becomes the master, assigns an ID number to each slave ADAT, checks if all units have a tape installed, checks if the tapes are formatted, and automatically locates all tape slaves to the position of the first ADAT. For the full story, contact Alesis Studio Electronics, 3630 Holdredge Avenue, Los Angeles, CA 90016. Tel: 310-558-4530. Circle EQ free lit. #109.

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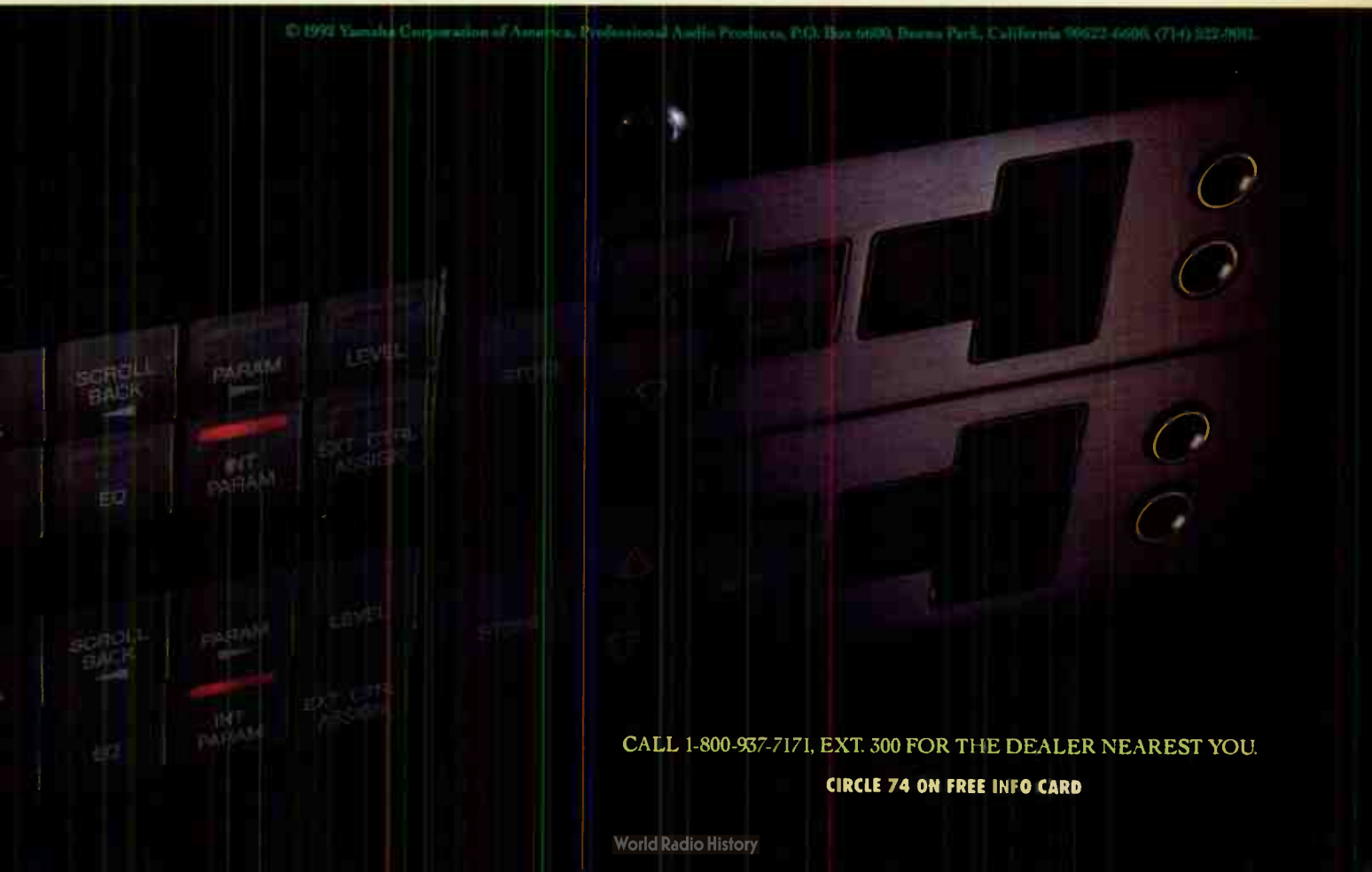
## THE GARY BURGOFF AWARD
### TO THE ANATEK RADAR

Anatek's RADAR (Random Access Digital Audio Recorder) is a stand-alone device that can record and play back a full 24 discrete tracks of digital audio directly to its onboard hard disk drives. No external computer is needed and it has been designed to work much like the standard tape recorder. For further information, contact Creation Technologies, 400 Brooksbank Ave., North Vancouver, B.C., Canada V7J-1G9. Tel: 800-665-4175. Circle EQ free lit. #110.

## THE BEST SERIES SINCE *STAR TREK* AWARD
### TO CREST AUDIO'S CENTURY SERIES CONSOLES

The Crest Consoles division of Crest Audio has been launched with the release of the Century Series models. These consoles are offered in frame sizes from 16 to 52 inputs. Among the features offered by the Century Series are: an independent Mono bus; eight Auxiliary Mix busses; selectable Pre- or Post-Fader on the front panel; four bands of sweepable EQ; a sophisticated Scene Mute system with four presets controlling channel and EFX inputs; and two Matrix Mix outputs standard. Prices range from $5000 to about $30,000. For the full story, contact Crest Audio, 100 Eisenhower Drive, Paramus, NJ 07652. Tel: 201-909-8700. Circle EQ free lit. #111.

© 1992 Yamaha Corporation of America, Professional Audio Products, P.O. Box 6600, Buena Park, California 90622-6600, (714) 522-9011

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## THE BETTER MOUSETRAP AWARD
### TO SONY'S K-1203 SUPER BIT MAPPING PROCESSOR

Sony's Pro Audio Products group introduced the K-1203 Super Bit Mapping Processor, which creates CDs with improved sound clarity. The K-1203 employs digital processing techniques, enabling mastering houses to use the capabilities of 16-bit recording generated from 20-bit source signals. Standard CD-quality audio is quantized at 16 bits, Super Bit Mapping requires a higher number, such as 20 bits. The finished product consists of only the most critical 16 bits. Contact Sony, Corporate Communications Dept, Sony Drive, Park Ridge, NJ 07656. Circle EQ free lit. #112.

## THE GREAT COMMUNICATOR AWARD
### TO BEC TECHNOLOGIES' AUDIOPLEX

BEC Technologies' new AudioPlex Pro-Line/Pro-Series transmits "digitally clean" audio over both copper wire and fiber optic cables, yielding better than CD audio quality. Up to 16 digital channels can be placed on each twisted pair of copper cables, and fiber allows 64 channels of bidirectional communications. AudioPlex's self-contained modules are also specifically designed to guarantee fail-safe communications. BEC's Fault-Tolerant Redundant Communications provides triple redundancy with three separate outputs. Dynamic range weighs in at 90 dB, frequency response is 0-22.5 kHz, signal-to-noise ratio is 87 dB. For more information, contact BEC Technologies, Inc., 1101 N. Northlake Way, Suite 3, Seattle, WA 98103-0891. Tel: 206-632-2431. Circle EQ free lit. #113.

## THE WAIT TILL A PRO GETS ONE AWARD
### TO THE SONY MINIDISC

Sony's MiniDisc (MD) is the first fully recordable and erasable optical disc format available to the consumer market. Up to 74 minutes of digital audio can be stored on a 2 1/2-inch optical disc. It is portable and provides shock resistance through use of a 10-second memory buffer system. The model line-up consists of the MZ-1 recorder/player ($750), the MZ-2P player ($550), and the MDX-U1 car stereo player ($980). Models offer auto track-numbering, title functions, blank disc space search, and random programmability. For the full story, contact Sony, 1 Sony Drive, Park Ridge, NJ 07656-8003. Circle EQ free lit. #114.

## THE "WE'RE ALL CONNECTED" AWARD
### TO THE AT&T DISQ DIGITAL MIXER

AT&T's DISQ Digital Mixer is a fully digital system that works in conjunction with analog boards and it is software-based. Developed jointly by AT&T Bell Laboratories, Russ Hamm, and George Massenburg Labs, the DISQ Digital Mixer uses an AT&T parallel processor with supercomputing capabilities to provide digital signal processing for audio postproduction and mixing. The DISQ Digital Mixer is connected to a Neve VR or SSL G series console via an Ethernet cable. The DISQ system utilizes the console's control surface but totally bypasses its analog circuitry. All mixing processes are performed in the digital domain with the AT&T processor. Components of the system consist of the Parallel Processor, the AT&T Digital Audio Interface, and the GML Series 2000 Automation Environment. Prices start at $325,000 for a 32-channel system. For more information, contact DISQ, Inc., 1790 Broadway, New York, NY 10019. Tel: 212-765-3417. Circle EQ free lit. #115.



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## THE GOLDEN GATE AWARD

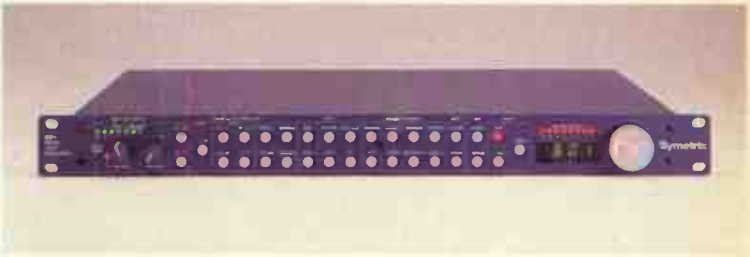
### TO THE DBX SUPERGATE

The new 172 SuperGate® from dbx uses sophisticated VCFs (voltage-controlled filters) to produce 24 dB/octave slopes that are twice as selective as those found on most conventional gates. The VCFs are also faster to set up because their quasi-parametric design allows you to zoom in on exactly the part of the instrument or part of the attack that you want to catch. In addition to the filter section, each channel includes: independent Threshold, Ratio, Attack, Hold, Release, and Depth controls; Gate, Expand, and Duck buttons and status LEDs; 13-segment Gain Reduction meter with Open and Hold status LEDs; bypass; and more. For more information, contact AKG Acoustics, Inc., 1525 Alvarado Street, San Leandro, CA 94577. Tel: 510-351-3500. Circle EQ free lit. #116.

## THE RICH LITTLE AWARD

### TO THE SYMETRIX 601 DIGITAL VOICE PROCESSOR

The Symetrix 601 Digital Voice Processor acts as a "bridge" from the analog to the digital domain, the 601 accepts mic or line level analog signals, converts to digital (18 bits), and then performs 24 bit digital domain signal processing at a rate of over 50 million instructions per second (MIPS). For more information, contact Symetrix, 4211 24th Avenue West, Seattle, WA 98199. 800-288-8855. Circle EQ free lit. #117.

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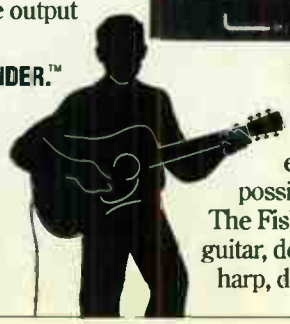

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# Beauty and The Beat

**LOCATION:** Studio A in Alan Menken's home in Upper Westchester County, New York. Studio B is under construction.
**MAIN MEN:** Alan Menken, composer; Rick Kunis, engineer, studio manager
**CREDITS:** *Beauty and the Beast, The Little Mermaid, Home Alone II, Rocky V, Little Shop of Horrors, Aladdin, Newsies,* ABC documentary *Lincoln,* several musical theater works that include *Mr. Rosewater, Real Life Funnies,* and *The Apprenticeship of Duddy Kravitz,* four Academy Awards, four Golden Globe Awards, two Grammy Awards, eight BMI Career Achievement Awards, the New York Drama Critics Award, the Drama Desk Award, the Outer Critics Circle Award and the London Evening Standard Award.
**CONSOLE:** Soundtrac Quartz 32-in, 24-out (discrete) with automation
**MONITORS:** KRK 9000s, small pair of Realistics
**AMPS:** Crown Microtech 1200, Hafler 600 for headphones
**RECORDERS:** Otari MX 5050 8-track, Tascam 238 Syncaset, Tascam DA-30 R-DAT, Sony DAT 75ES, Tascam 122MKII cassette, Onkyo Integra cassette, Sony TCW7ES hi-speed duping deck
**KEYBOARDS:** Kurzweil K1000, Yamaha DX7, Yamaha Disklavier
**MICS:** Neumann U87, AKG 414
**VIDEO:** 27-inch JVC S-VHS monitor, Hitachi 13-inch monitor, Mitsubishi BV-1000 S-VHS VCR, Sony MDP LaserDisc player
**OUTBOARD GEAR:** Kurzweil 1200 Pro, dbx NR, E-mu Proteus 1 & 2, Macintosh 950 Quadra, Mac IIci, Mac SE30, Powerbook 170, GCC BL II S laser printer, Yamaha SPX 900, Yamaha Rev 7, Roland AV controller, Roland A80, Korg O1RW, Korg M3R, Roland R8M drum machine, Yamaha FBO 1, KMX 16x15 patchbay, Mark of the Unicorn MIDI Time Piece, 20-inch Ikegami 24-bit computer monitor, Sony headphones, Furman Power Conditioners
**EQUIPMENT NOTES:** Menken states: "I do a lot of MIDI mixing direct to DAT. I tend to favor the real sounds. I want a true piano sound and that's why I love the Kurzweil. The Proteuses are my favorite modules. But I still get a lot of use out of the DX7. I use MOTU Performer software — I think it's the best choice. The MIDI Time Piece offers me a tremendous amount of flexibility. I can just call up instruments from storage — both channels and cables — so I have much more capacity than I could ever possibly use in terms of instruments. Using the MIDI Time Piece, I sync music to video through the Mitsubishi VCR. I use Composer notation software, but I will be switching over to Mosaic."

The Yamaha Disklavier is a central tool for Menken's composing and arranging. Says Kunis, "Alan does a lot of composing on it. It allows him to hear his work with objectivity and to instantly review his work. The sophisticated electronics are entirely internal so it fits in the house as well as the studio. Alan often works at it down in the sun room where he can overlook the terrace, the pool, watch the sunset."
**PRODUCTION NOTES:** Menken says, "My personal studio is used essentially for composing, scoring and demoing of my own work. It's my personal workspace. For larger group sessions I go out-of-house to larger studios in New York and L.A. I often use my old friend David Lucas's Warehouse in Manhattan. He has a company called 4/4 and it's a very friendly comfortable studio. We do our masters at BMG, but it's unfortunate that they plan to close it and sell it off for office space. In L.A., we frequently use the Todd-AO and Sony Studios."
**ADVICE:** "MIDI and computers are an incredible boon to the process of scoring," explains Menken. "They give you the ability to hear the music you've written against the picture and modify it as you wish. The technologies allow you to demonstrate the music to directors and get their comments, which saves a lot of artistic train wrecks. And being able to go to a studio with a click to a tenth of a beat per minute that you know will work exactly as you need it to work is a great advantage. But on the other hand, don't ever forget that even with all this equipment and all the technological wizardry, it's all about drama. It's all about human feelings and you've got to make sure that you don't get caught up in clicks or in the sound of a synthesizer or some great effect. You've got to remember that it has to rest in the music and I think my career's been an example of how much people still respond to basic musical values." EQ

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**N'S SCORES**
**IEY IN HIS**
**DIO**

Photo by Peter Monroe



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# The Computer Quagmire

Photo by Ed Aiona

Sure the election is over. There's still time to pick your favorite (computer) platform.

**BY CRAIG ANDERTON**

Now is not necessarily a good time to buy a computer. Not that it ever is — something faster, better, and cheaper will always come along six months later. But these days it might be particularly wise to hang on to the machine you have a little while longer.

The reason is that the second wave of personal computers is looking pretty old. The first wave of 8-bit machines (Apple II, Commodore-64, Atari 800, original IBM PC) peaked in the mid-1980s, at which time the second wave hit. The Mac, Atari ST, and Commodore Amiga brought a graphic interface, faster processors, and 16-bit operation to the party, while IBM-machine "clones" were developed that became the budget alternative for text-oriented applications. Today's machines have more memory, greater speed, and better peripheral chips, but are still based on 10-year-old technology. In high-tech, that's an eternity.

This also locks companies into the past. Windows, the *hype du jour* for PCs, remains a slave to DOS with its 8-character file names and other oddities. Mac users, disenchanted with System 7's sluggishness (as well as with the cost of upgrading software to 7), are sticking with System 6 for as long as they can. The Amiga's once-breathtaking graphics and sound capabilities are commonplace, and Atari has milked the 1040 ST for all it's worth. Flagship machines of yesteryear, such as the Amiga 1000 and Mac Plus, are becoming boat anchors.

Nonetheless, if you own a studio in 1992, you pretty much need a computer. So what are your options?

### IBM: WINDOWS WASHER

IBM always seems the last to "get it," from the PCjr., to the Clamshell portable, to just now discovering MIDI (and getting upstaged by a Microsoft operating system). Yet the installed base is huge; developers love doing projections: "If we sell to just 5 percent of the PCs out there, we'll all be multimillionaires!". Music software continues to take a back seat to business, but the situation is improving rapidly.

Still, Windows — a slow, clunky memory hog — does not turn a PC into a Mac; it gives your machine a face-lift without really addressing some of the PC's problems. Clone prices are unbeatable, though. A $2000 clone will scream, but a $2000 Mac will only talk in a loud voice.

Windows NT will supposedly break with DOS completely and unchain the PC from the 1980s, but it's not here yet. You might want to wait long enough to see if Mac maintains its operating system superiority vis-a-vis Windows NT. Meanwhile, cheap clones do make cost-effective "appliances" to run particular pieces of software.

### MACINTOSH: '90s YUPPIE COMPUTER?

Based on the phenomenal sales of the Mac Powerbook, the answer is yes. Apple's commitment to music has traditionally been soft; MIDI Manager is moribund, and no one at Apple seems to care. They could at least adopt Opcode's OMS, but I suspect the "not invented here" syndrome applies. Some say the Beatles's lawsuit prevented Apple from committing to music, while others blame Apple's internal priorities.

Apple has made some good moves lately: dropping prices, producing more models, and coming up with a fun laptop. But gone are the days of the closed architecture, one-size-fits-all philosophy, so the famed "ease of use" isn't what it once was. Also, some products have incredibly short lives — the Classic's paint seemed hardly dry before the Classic II came out. Still, the Mac family has the smoothest operating system, the price of admission is getting lower, and there's plenty of music software.

So why wait? Simple. There's a gnawing feeling that when the dust settles, Apple may not be able to hold its own against the clone tidal wave any more than IBM. Windows NT could pole-vault the clones over both companies unless Apple continues to increase its market share.

### ATARI: DAVID VS. GOLIATH

Atari targets its products mainly at musicians, and with good reason: music is the one area where Atari has a significant market share, especially in Europe.

Atari is also in the trough between technology waves, but at least we have a preview of the next wave: the Falcon030. It's impressive — a 68030-based machine with onboard 56001 DSP chip, MIDI ports, and graphics coprocessor, all for $1295 with a 65 MB internal hard drive and 4 MB of RAM. A $200 program allows for stereo hard-disk recording. Sounds great, right? Well...

The reason for waiting is to see

Atari is also in the trough between technology waves, but at least we have a preview of the next wave: the Falcon030.



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what kind of software develops for the machine. Many developers had written off Atari, and though the Falcon030 is turning a lot of heads, it's hard to predict whether the amount of software will reach "critical mass." Atari's best hope is that, despite what Apple says, the Mac is no "computer for the rest of us," and perhaps the Falcon030 will grab that title. But only time will tell if this is the machine that puts Atari on the map big-time.

**COMMODORE: HOLES IN THEIR SHOES**

Several years ago, a film-scoring friend wanted to buy a computer and commissioned an expert to evaluate available computer hardware. His order of preference: Amiga, Atari, Mac, and, lastly, the PC.

Yet Commodore's marketing has been so seemingly dismal that, had it not been for NewTek's Video Toaster and the Amiga's inherent videotape-friendliness, it might have been a footnote in the history of computing. It's a shame, really. The Amiga was so ahead of its time when it came out that few people got the point, so it never really got the support needed to stay ahead of its time.

There aren't many choices in music programs; however, video enthusiasts swear by the Amiga, and when they need to do audio or music, the Amiga certainly has enough software to get by. So why wait on buying an Amiga if you're into video? Simple. The Falcon030 might beat Amiga at its own game, or Commodore's CDTV might take off (but don't bank on it) and grab market share by sneaking in as a home computer disguised as an interactive-CD machine, which could recharge the entire Commodore line. But that's all up in the air right now.

**DECISIONS, DECISIONS**

So where does all this leave us?

•You're probably going to need more than one computer platform (sorry) because no one computer does it all, and you often need to be compatible with the rest of the world (Murphy's Law states that your most important client will always use a different machine).

• The handwriting is on the wall: one platform will almost surely have to be a Windows-compatible machine.

• Invest in emulation and bridge software so you can get files from one platform to another.

• If you need a computer now, get something that will make enough money to pay for itself inside of two years, when the scene will have (hopefully) settled down a bit. Then, commit some big bucks to a third-wave computer system that will last for another decade...and get ready to go through the whole merry-go-round all over again. EQ


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# Digital Tape Wars: 8mm vs. S-VHS

Format wars have characterized the consumer video business since its inception. First it was Beta versus VHS. Then it was VHS versus 8mm. And now that consumer video technology has made low-cost digital multitrack recorders a reality, these format wars have found their way into the studio scene as well.

There's a new videotape format war brewing and this time low-cost digital multitracks are the battleground

**BY RICK SCHWARTZ**

With units already on the market from Akai, Alesis, and Yamaha, and Tascam's much talked about digital 8-track just around the corner, users will be faced with some tough choices. But that's not all. Fostex recently announced its support for the ADAT digital multitrack format through a licensing agreement with Alesis. The various machines have hardware characteristics all their own. But beyond these differences is the question of which tape format is best for your needs. The tapes differ in terms of cost, storage capacity, size, and more.

From a technical standpoint, recordists need to consider much more than just the tape format a digital multitrack uses. From the point of view of standardization, however, there is quite a bit at stake. In a world where compatibility is a major issue, where studio operators need to exchange tapes easily with other musicians, producers, and commercial facilities, the tape format that builds the larger marketshare may turn out to be the long-term winner.

For the time being, however, a look at the tape formats themselves offers a comparative view of how several leading manufacturers see the future of low-cost digital multitracking. Let the chips fall where they may.

## BOLD CLAIMS

One of the most popular debates involves tape width. Are the newer narrow tape formats like 8mm less reliable than the descendants of VHS?

According to Fostex's vice president of marketing David Oren, "S-VHS has more tape passing over the head drum each second than 8mm. Almost four times the tape surface per second at standard speed and over eleven times as much at ADAT speed each

Illustration by Normal Rockhard

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Like the dinosaur, conventional mixers have bodies that are bigger than their brains. But now there's a leaner, smarter, faster species of mixer for both stage and studio: the DCM-100 Digitally Controlled Mixer and MIXTAB™ Controller.

# THE DINOSAUR MIXER IS ABOUT TO BECOME EXTINCT.

Say goodbye to the dinosaur's big footprint. The DCM-100 packs a full-featured, 16 channel (8 channel stereo) mixer in a single rack space. Cascade three of them for up to 48 inputs.

Say goodbye to high cost. With MIDI parameter automation you don't pay for zillions of knobs and switches, most of which you set and forget anyway.

And say goodbye to mixing with a mouse. The MIXTAB human interface provides 8 channels of hardware knobs, switches, and faders for level, muting, EQ, panning, and more. It works and feels like a traditional mixer. Use it to program your sequencer quickly and painlessly, change selected parameters in *real time* to add spontaneity to your mixes, or to control the DCM-100.

There's more: 100 "snapshots" you can recall with MIDI program changes. LED null indicators for easy level matching before you record new moves. Exceptional sonic integrity. And a mercifully short learning curve.

The DCM-100/MIXTAB combination is a whole new kind of animal – after all, dinosaurs belong in museums. To find out more about the latest evolution in mixers, see your favorite Fostex dealer.

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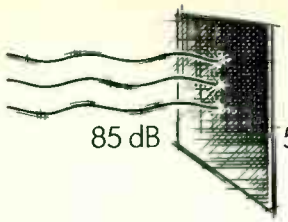


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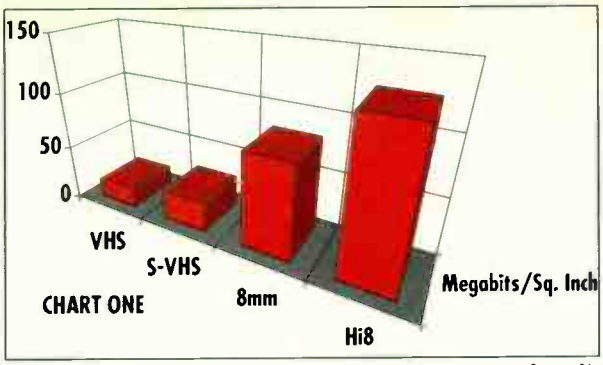



second." To this, Alesis vice president Allen Wald adds: "It can be proven that a single piece of dust can interrupt the linear path of the tape past a rotary recording head and cause irreparable errors. ADAT is liberally over-designed to account for this with strict regard for large bit size and wide track width."

Paul Young, product planner with Tascam, says that 8mm is simply a more modern medium. "As technology has progressed, the physical storage medium has gotten smaller and denser. That goes for videotape, RAM, digital storage, anything. The fact remains that our track width with 8mm tape is actually one and a half times the track width of RDAT. And, in terms of reliability, RDAT is a proven format and the accepted professional standard. In terms of error correction, we have over-engineered our product to prevent any problems. Besides, the advanced nature of the 8mm shell makes an extra provision for dust prevention, covering the tape on both sides during storage. With VHS, the tape is exposed in the shell."

Clearly there is a difference of opinion here, but who is right?

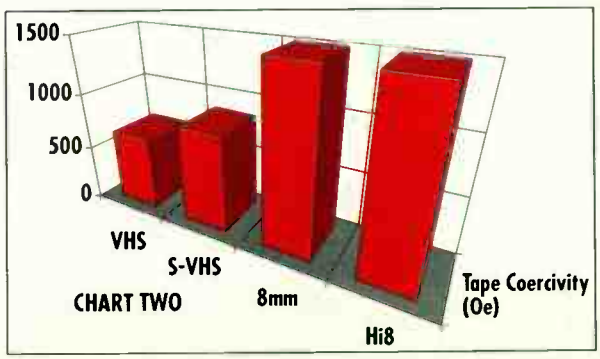
### MAGNETIC ROOTS

"Of course there are differences in tape formats," says Mike Johns, market development manager at 3M. "Hi8 is based on a format that came out ten years later than the original VHS tape." The S-VHS format, launched in 1987, represented an evolutionary step in the development of the VHS system. The use of better tape resulted in improved picture resolution." According to the *Ampex Guide to Media & Formats*, when the 8mm format was introduced in 1985 it made use of an embedded tracking servo rather than the longitudinal control track, thus promising perfect tracking and eliminating the need for a tracking control.

Although the benefit of using narrower stock is a smaller cassette size, it does not come without a price. According to Steve Smith, marketing manager of audio tape at Ampex, "When you reduce the size of the media, the system needs to make up for it by using more sophisticated electronics and higher output tape." This is why 8mm tape systems use metal tape formulations to store more data per cubic or square inch of tape (see chart 1). Smith adds that Ampex manufactures a military airborne recorder that uses S-VHS T-120 cassettes and offers 10.4 Gigabyte storage capacity.

VHS is, in fact, almost twice as thick as Hi8 in a tape with the same play time (10.9 vs. 18.1 microns). However, according to Bruce Fellows, senior technical service engineer at 3M, the transport design, not just the tape thickness, ultimately determines how well the tape format will perform for digital audio recording.

Still, the basic specifications of the tape formulations are quite revealing. Chart 2 compares the coercivity (the amount of magnetic force necessary to return a tape that has had signal recorded on it to its original non-magnetized state) of all four consumer videotape formats. As you can see, Hi8 has almost twice the coercivity of S-VHS tape. According to Smith, the higher the coercivity, the harder a tape is to record or erase. It also means there's a higher retentivity (the measurement of the residual magnetization after a tape is returned to its non-magnetized state), which is another one of the attractions of the



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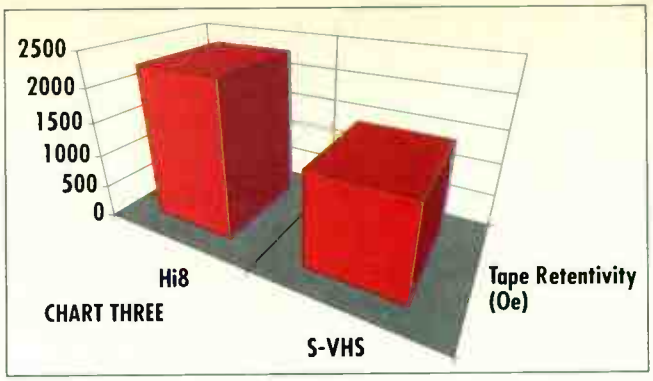

CHART THREE

metal tape formats (see chart 3).

Fellows explains that higher coercivity tapes are better for applications requiring greater information densities. He says, "S-VHS does not use a metal particle tape. It uses a cobalt-modified iron pigment. It is a high-coercivity tape but Hi8 is a much higher one."

Alesis makes its system's transport move three times faster than a normal VHS transport (see chart 4) to compensate for these differences.

What's more, Wald adds that "it is a faulty assumption to consider that coercivity and retentivity are significant factors in choice of media for digital multitrack recording. They are not. In fact, had we designed the ADAT to make maximum use of the coercivity and retentivity of S-VHS, and had we pushed the format to deliver maximum bit density, we could have had longer recording time or even more channels of audio. But reliability and interchangeability would have suffered."

To which 8mm supporters like Tascam's Young responds: "Coercivity and retentivity are significant factors. Digital audio recording requires high density and, as Fellows says, higher coercivity tapes are better for applications requiring greater information densities. Retentivity is also important for the longevity of the tape."

"The narrow width of 8mm systems shouldn't worry you," he adds, "considering the fact that these drives are used extensively for computer data backup. And, with computer data, if one bit of information is lost you could have a serious problem. In practice, unrecoverable errors are rare. All systems included in this survey use a Reed Solomon type of error correction, which minimizes the effect that dropouts have on tape performance. The fact that Exabyte has built one of the most successful data storage companies based on 8mm-cassette technology should indicate how reliable these products really are."

To which Wald counters, "With tape data storage devices it is not required to re-record a specific portion of data without affecting data around it. In multitrack recording, this is exactly what must happen when punching in and out. Data backup tapes simply have to record a large block of data *without* retaining any data on the tape. When recording multitrack audio, however, a single channel of audio must be able to record or re-record in a very specific location on the tape without the danger of altering or erasing any other channel of audio. In addition, data backup tapes have the luxury of rewinding and re-reading a section of data as many times as required in order to recover the information. Because multitrack recording is a real-

*continued on page 80*

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# THE MADONNA

## Erotica's coproducer brings us into the inner sanctum of Madonna's latest labor of lust

I remember when Madonna and I first started working together on *Erotica*. We were listening in my home studio to one of the first songs and I turned to her and said, "It's great, but it's no 'Vogue'." She told me that not every song could be "Vogue" — not every cut could emerge as the top-selling record of all time. She was right, but I pressed my case anyway: "I guess I'm always trying to out-top myself," I told her, "the next thing should be bigger than the last." Madonna just turned and looked me straight in the eye. It had been a long time since I'd been star-struck by her, but she was glowing differently now. "Shep," she began, "no matter how fierce something is, you can't ever do the same thing twice." She sat down to record the final vocals on "Erotica" and looked out onto the terrace and into the New York City night.

"Ever," she repeated.

By Shep Pettibone



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# Diaries

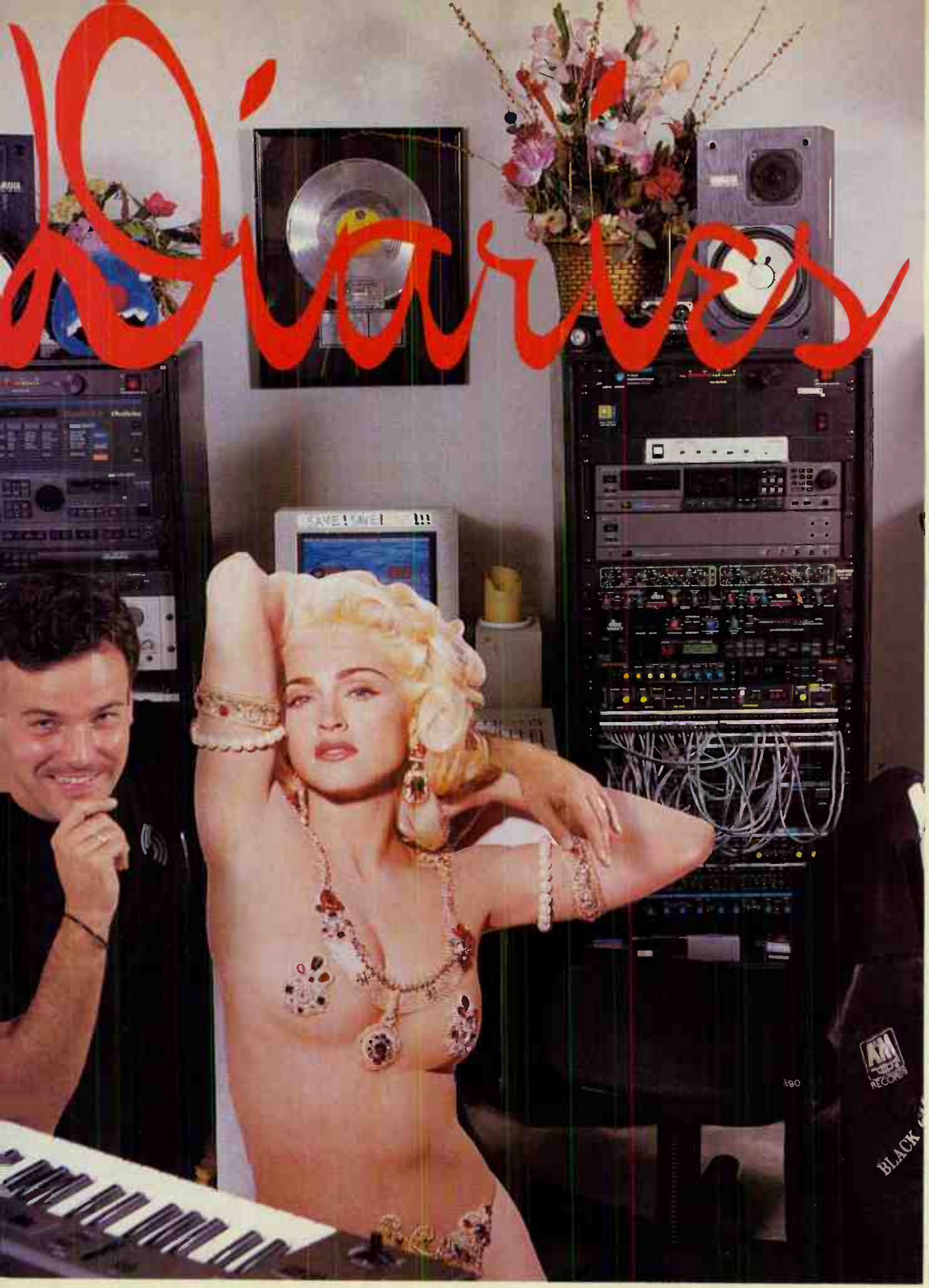

Photo by Peter Monroe



World Radio History

Editor's Note: The Polaroids in this article were taken during the Erotica sessions and carry Madonna's personal handwritten annotations.

**JULY – AUGUST 1991**

I wanted to start writing again. The last project I had worked on with Madonna was *The Immaculate Collection* but that was just a month and a half of working with that QSound stuff. I knew I could do something great after "Vogue" and "Rescue Me," so I just started putting tracks together with my assistant, Tony Shimkin. I wanted to have a few songs for Madonna to listen to when I went out to Chicago, where she was filming *A League Of Their Own*. I had no idea that she was planning to do an album at that time, but then again, neither did she.

I arrived in Chicago on July 8th and gave Madonna a cassette. I told her to give it a listen and tell me what she thought. She said she'd listen to it in the car, in the trailer, wherever she could. A few days later, I heard back from her. Madonna liked all the songs — three out of three. I decided to work on a few more.

Usually, when I sit down to write, it isn't as if I have a specific person in mind for any one song. By the time I get to a certain place in the music, it begins to mold itself an identity and I think, "Hey, this person would like that." At the time, Cathy Dennis, Taylor Dayne, or Madonna were the primary inspirations for a variety of songs.

**OCTOBER – NOVEMBER 1991**

Madonna returned to New York and we began to work on demos in my apartment. It's cool working at home. It's convenient, cozy and there's no studio time ticking by. Plus, if you wake up in the middle of the night and you have an idea, you just go upstairs, turn on the equipment, and go. Our schedule was kind of sporadic in the beginning. I'd work with her for a week and then she'd go off to work with Steve Meisel on her book (*Sex*) for two weeks. Occasionally, Madonna would meet with Andre Betts, her coproducer on "Justify My Love." While she was away, I would spend time coming up with other tracks or work on Cathy Dennis and Taylor Dayne material. At this point, I wasn't working on any remixes — just writing.

"Deeper and Deeper," "Erotica," "Rain," "Bad Girl," and "Thief of Hearts" made up the first batch of songs we worked on together. I did the music and she wrote the words. Sometimes I'd give her some ideas lyrically and she'd go: "Oh, that's good," or: "That sucks." I remember when I gave her some ideas lyrically for "Vogue" and she said, very curtly, "That's what *I* do." Essentially, her songs are her stories. They're the things she wants to say.

I did everything upstairs in my home studio: keyboards, bass lines, and vocals. Depending on the mood I was in, I chose from an Oberheim OB8, Korg M3, or a Roland D-50. On the sampling side, the Akai S1000 was our prime workhorse. We used it to

## Shep Pettibone – Mix Maestro

IF REMIXING WAS THE music industry's latest monster, then Shep Pettibone was its Dr. Frankenstein. After tailoring his craft as a part-time DJ and record-store owner, Pettibone plunged headfirst into the remix craze in the 1980s by re-creating hard-hitting versions of songs for a variety of dance queens including Loleatta Holloway, Gloria Gaynor, and Alisha. Suddenly, Pettibone found himself in the eye of the pop hurricane, where New Wave acts such as Pet Shop Boys, Thompson Twins, New Order, and Erasure were spinning out an enormous web of dance songs ripe for the remix. Not surprisingly, clubs immediately took to this new form of dance music, but radio still handled the genre with kid gloves. Essentially, they needed an excuse to play New Wave. Pettibone gave it to them.

By inventing powerful dance versions of "Chains of Love" (Erasure), "Something About You" (Level 42), and "West End Girls" (Pet Shop Boys), Pettibone transformed the way radio listeners heard music. It seemed as if anything, no matter how staid or played, could be given an enormous backbeat and transformed into a dance hit. As a result, remixes began to influence the way songs were marketed, and, more important, how they were created.

By the time the 1980s came to a close, Janet Jackson, Paula Abdul, MC Hammer, Lionel Richie, Prince, and Cyndi Lauper had entrusted their work to Pettibone. In the meantime, an icon-in-waiting by the name of Madonna approached him to remix her song "Get Into The Groove," thus initiating a relationship that would span several hit records, including "True Blue," "Where's The Party," and "Causing A Commotion."

"By the time I worked on 'Like A Prayer' and 'Express Yourself,'" says Pettibone, "it looked as if Madonna liked the remixed versions better than the ones that were on the album. That was great, but producing was still at the top of my wish-list."

Pettibone got his wish when he was asked to write and produce a B-side single for Madonna's *I'm Breathless* album. That B-side eventually became "Vogue," which, in turn, became the largest-selling single of 1990. Pettibone had arrived on the production scene, in a big way.

With a bonafide smash under his belt, Pettibone went back to work for today's hottest entertainers, while juggling a client list of post-modern disco divas that included Cathy Dennis, Taylor Dayne, Mariah Carey, and of course, Madonna. Of all his compatriots, however, it was Madonna who most encouraged Pettibone to continue writing, spurring on what would eventually evolve into Madonna's current tour de force, *Erotica*. With a ground swell of multimedia publicity, the album entered Billboard's Top 200 at #2 in its first week.

*—Jon Varman*

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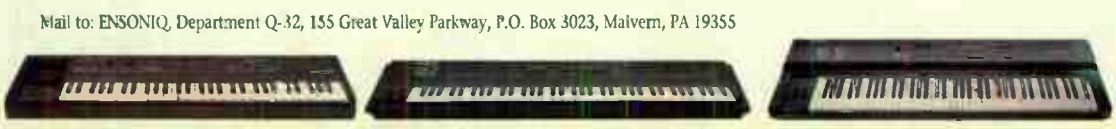

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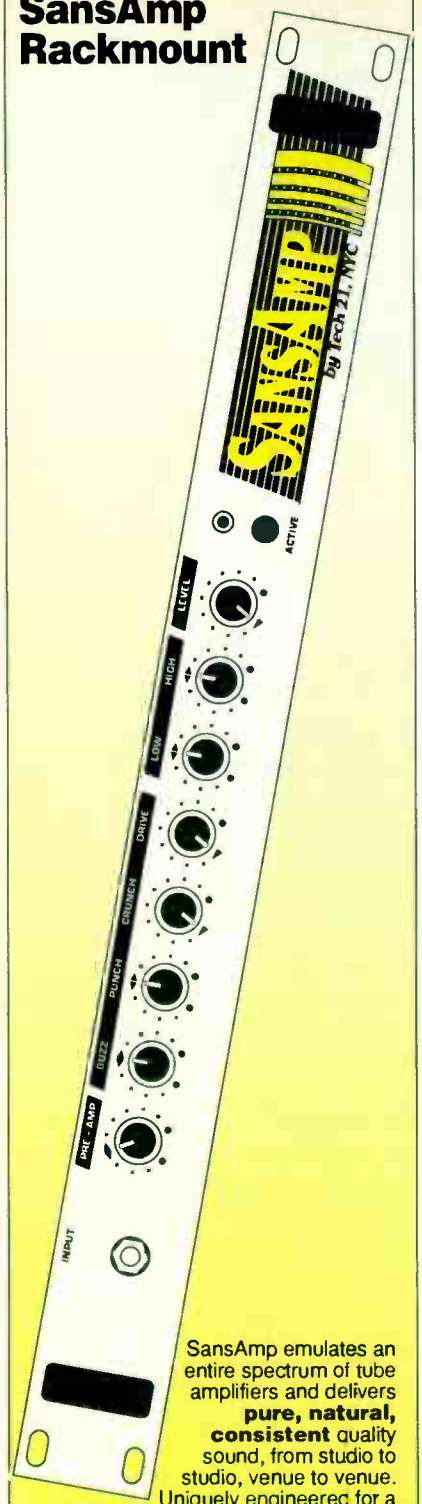


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sample snake charms for "Words" and Kool & the Gang horns for "Erotica."

When it came time to record demos, we laid down a track of SMPTE on the last track of my 8-track Tascam 388 Studio 8 reel-to-reel, which has dbx. Usually we'd put the track down on tracks 1 and 2 in a stereo mix, and then bring Madonna's vocals in on 3 through 7 — a lead, a double lead, the harmonies, and the background parts. Ninety-eight percent of the time, the vocals recorded in my apartment were the keeper vocals, the ones you hear on the album.

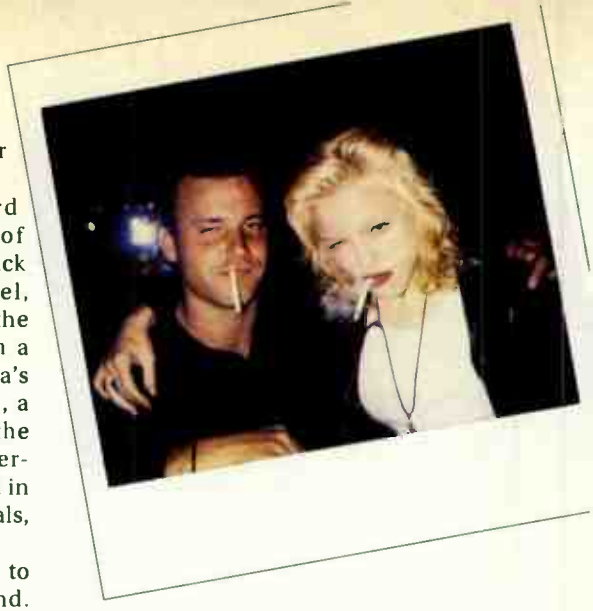
It took about two or three days to write a song from beginning to end. Still, sometimes even after they were done we'd want to change the flow of the song and ask the song a few questions: Where should the chorus hit? Should it be a double chorus? Sometimes Madonna would call me in the middle of the night and say "Shep, I think the chorus should go like this," or "I hate this verse, fix the bass line." "Deeper and Deeper" was one of those songs she always had a problem with. The middle of the song wasn't working. We tried different bridges and changes, but nothing worked. In the end, Madonna wanted the middle of the song to have a flamenco guitar strumming big-time. I didn't like the idea of taking a Philly house song and putting "La Isla Bonita" in the middle of it. But that's what she wanted, so that's what she got.

**DECEMBER 1991**

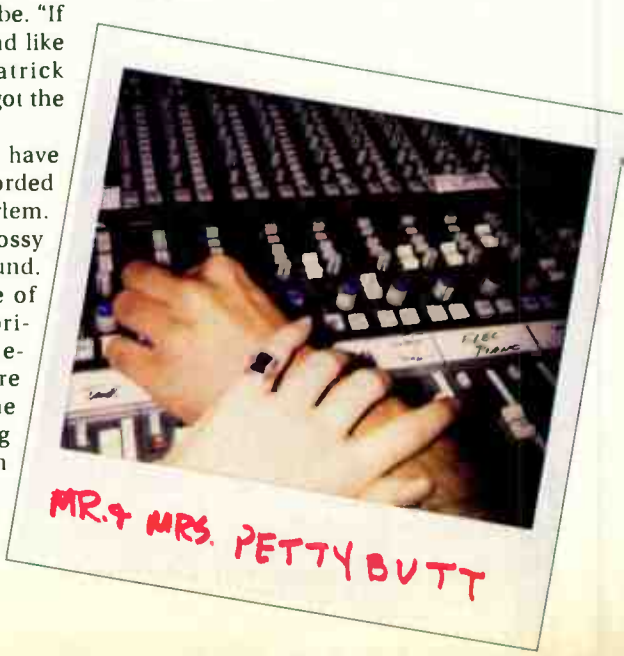
*"I hate them."* That's what she said to me when we listened to the first bunch of songs we'd recorded. I thought it sounded great because some of the songs had a New York house sound and some of them had an L.A. vibe. "If I had wanted the album to sound like that, I'd have worked with Patrick Leonard in L.A.," she told me. I got the point pretty fast.

Madonna wanted *Erotica* to have a raw edge to it, as if it were recorded in an alley at 123rd Street in Harlem. She didn't want some light, glossy production to permeate her sound. I got back into my usual style of mixing, which is pretty bass-oriented, analog, hit-you-over-the-head kind of stuff. When you're recording songs for Madonna, the attitude is: Either make a song work, or it's not going to be on the album. That's that.

Typically, Madonna would get over to my place by one in the afternoon and we'd work until eight or nine at night. Improvising vocals took one or two passes and by the time the third pass came around, she'd get on the mic and say "Let's go." Madonna has an incredible mind; she locks the melody into her head and memorizes the words immediately. She doesn't even have to read the words off the paper when she's singing.



The only problems were during sequencing, when we had to do something on the Mac that would take some time. Two minutes into it, Madonna would ask us: "What are you guys doing that's taking so long!" — and this was just after the first few minutes. We'd tell her to go downstairs and make some popcorn or phone calls so that we could put the song together and she'd do that for about five minutes before screaming: "Come on, guys, I'm getting bored!" I had to keep things moving as fast as possible because it's one of my jobs to keep Madonna from losing interest in what she's doing.



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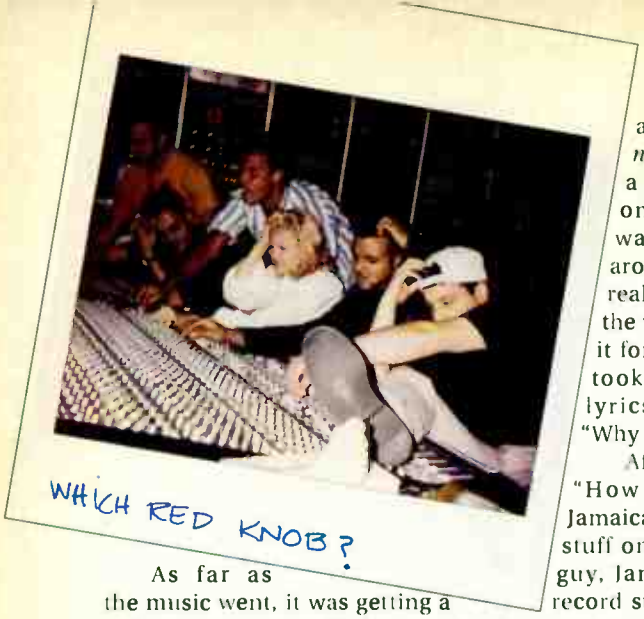



As far as the music went, it was getting a little melancholy by that point. It definitely wasn't up-and-happy music. Maybe I inspired songs like "In This Life" and "Bad Girl" because they were written in a minor key. But Madonna's stories were getting a lot more serious and intense and she was definitely driving the creative direction of the songs into deeply personal territory.

**JANUARY – FEBRUARY 1992**

I spent Christmas on vacation in Jamaica and when I got back on January 2, I was like "Oh man, I am *not* ready for this." There were a lot of intense songs to work on for Madonna, but all I had was this reggae-ish vibe going around in my head. Jamaica had really had an impact on me. I put the vibe down on tape and played it for Madonna, who immediately took to it. Once she got all the lyrics down, the song became "Why Is It So Hard?."

After it was done we thought: "How about if we get a male Jamaican rapper in here to do some stuff on the record?" We found this guy, Jamaiki, who runs a Jamaican record store uptown. He was this big guy with a real deep-ass voice. When we were trying to explain the song to him, he just looked at us and said, "Do you have any rum, man?" By the time Jamaiki was laying down the tracks in my studio, he was dancing around, swigging rum and spilling it everywhere. We ended up not using the track because it sounded too rough for the song, but it was a very fun day — completely different.

By this point, people had begun to realize that Madonna was recording in my penthouse. All day her fans would wait outside, even though it was freezing, just to catch a glimpse of her or take a picture. One particular day, when I walked her down to her car, the lobby was filled with building residents getting the mail, hanging out at the front desk, sitting on benches. It was weird because usually the place is empty. After I walked her outside and ran across the street to get the day's newspaper, I came back to find nobody there. People were coming downstairs to the lobby just to get a look at her, even if it was out of the corners of their eyes.

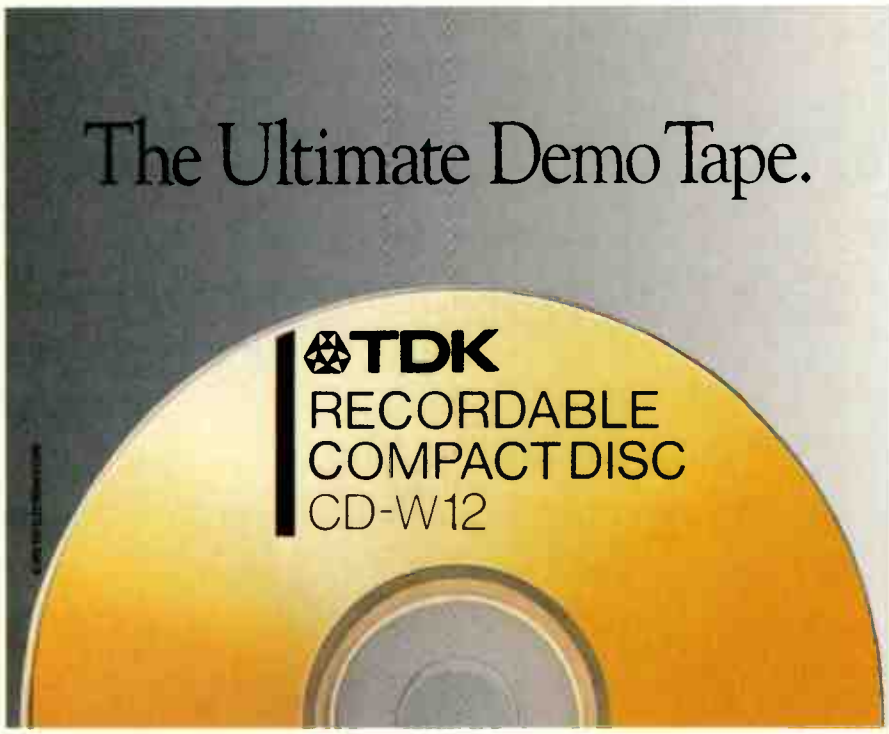
**MARCH 1992**

Now I knew we were doing an album. We had fifteen songs demoed and she liked them all. The last song we did was for the movie, *A League Of Their Own*. Madonna just started singing a melody over and over again into the Shure SM57 microphone while the Mac with Vision was playing strings, organ, piano, and a basic rim-shot loop. It sounded really timeless, very nostalgic. I spent all night filling in the verses and the song became "This Used To Be My Playground."

The day after "Playground" was finished, Madonna went to Oregon to work on her next film, *Body Of Evidence*, with Willem Defoe. This gave me some time to wrap up work on some songs with Cathy Dennis and Taylor Dayne at Soundworks Studios in New York. The workload had grown quite intense since the beginning of the year and it showed no signs of letting up. Thanks to my manager, Jane Brinton, we were able to coordinate all the ongoing projects without a hitch.

**MAY 1992**

I met Madonna at Oceanway Studios in Los Angeles to complete the

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World Radio History

## Miking Madonna

WHEN MIKING a singing superstar, do you pull out all the stops? Or do you just stick to the basics, record in your apartment studio, and employ the help of a beat-up old mic?

If you chose option two, then you're striking the same studio pose as Shep Pettibone and Madonna. Simply put, Madonna would sit in the middle of Pettibone's cozy apartment studio and sing into an old Shure SM57, while two Yamaha NS-10 nearfield monitors blasted out the goods over Manhattan's Third Avenue.

"Madonna didn't use headphones," says Pettibone. "We had these monitors pumping out the music, which definitely makes for more leakage. But who knew we'd be using the demo vocals in the final mix." When it came down to isolating vocals for remixed vocal dubs, Pettibone used Drawmer gates to eliminate drumbeats and sounds that would otherwise show up on a track because of leakage.

When smooth melodies were called for, a Yamaha SPX 900 or Roland DEP-5 came into play, while spoken parts were recorded dry. For one track, "Bye Bye Baby," Madonna and Pettibone searched for an old 1940s feel, which would make the vocals sound as if they were coming out of an antique radio. They found their sound with a Pultec HLF filter.

Although the *Erotica* production team would eventually go hi-tech behind Soundworks' 48-channel SSL board, the mind-set was still mostly one of low-tech standards. One example came during the overdub sessions for "Bad Girl," when Madonna came up with some new lyrics for the song. "We had to record new vocals for the second verse," explains Pettibone, "and they had an SM57 handy. The only problem was that it was a brand new microphone and we had recorded the original vocals with the old SM57 back at my apartment. We knew the song wouldn't sound cohesive, and it didn't." Pettibone ran back to his studio and returned to Soundworks with the tried-and-true mic. "Sometimes," he adds, "older is better."

*—Jon Varman*

orchestra parts for "This Used To Be My Playground." We had to record a string arrangement — something I was excited about but had never done before. Madonna chose Jeremy Lubbock to do the arrangements because he had done such a good job with her *I'm Breathless* material and came highly recommended. Everything went fine until the point when the orchestra played their parts; we didn't like what we heard. Madonna and I had to change the whole arrangement, right there in the studio, with a full orchestra sitting there getting paid for taking up space — around $15,000 for three hours, $3,000 for every half hour over that. And of course, Lubbock was talking to two people who didn't know a C from a B natural. The pressure was on.

I can only sing the notes I hear at the moment, so that's what I did. Madonna and I stood there over my little Mac, singing the notes, and Lubbock would go, "Oh, that's a G; Oh, that's a B" and that's how it got done. We completed the session in 2 hours and 58 minutes — two minutes away from another three grand.

The last day of recording fell on Memorial Day. Madonna wanted to do the lead vocals again, insisting that it would sound better. It did. I finished off some edits before going over to a party Madonna was throwing in her Hollywood mansion.

**JUNE – JULY 1992**

The schedule for recording at Soundworks in New York went something like this:

- June 8 — "Erotica"
- June 9 — "Words"; "Why's It So Hard"
- June 10 — "Why's It So Hard"; "Thief Of Hearts"
- June 11 — "Thief Of Hearts"; "Goodbye To Innocence"

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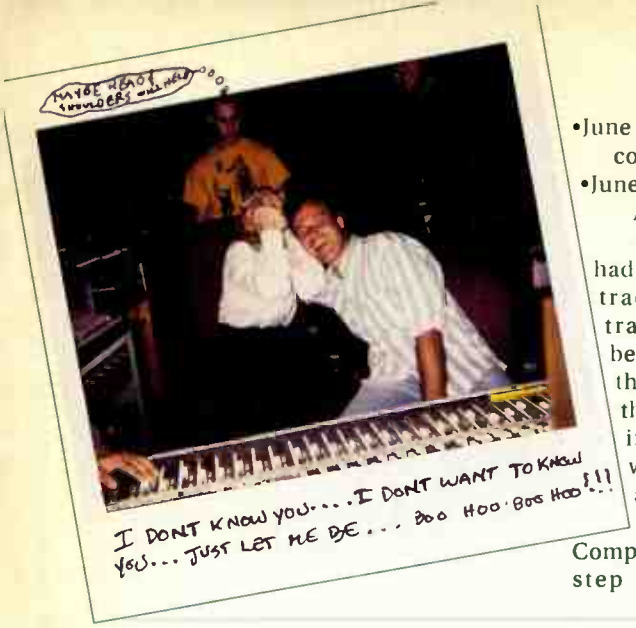


•June 15 — 8-track dumps w/no time-code
•June 16 — "Deeper and Deeper"
And so on and so on...

We transferred everything we had on the Tascam 8-track onto 24-track. I decided to produce the tracks 15 ips with Dolby SR because it has this warm bottom in the bass and I wanted to capture that for *Erotica*. Plus, I was listening to some of my old remixes, which were recorded at 15 ips, and was amazed at how much more you could feel the music. Compact discs seem to move you one step away from the music, while records put you right in the mix. So I figured that if I overemphasized that LP feeling, it would rub off on the CD, which is the primary format manufactured for American audiences today. Strangely enough, our country can't get any LPs of *Erotica*, while the rest of the world can.

On July 7, we did the mixing for "Erotic," the ode to S & M that Madonna wanted to include in her book, *Sex*. She felt it should sound the same as "Erotica" (the song on the album), with just a bass line, her voice, and some sensuous Middle Eastern sounds. But by then I had seen the book and had come up with an interesting idea. "You have all these great stories in the book," I told her, "why don't you use them in the song?" I knew that Madonna was developing a 1930s dominatrix-look for *Erotica*, but I didn't realize how far she was willing to go until I saw *Sex*. It contained stories authored by her mysteriously dark alter ego, Dita.

Madonna took the book and walked out of the room and didn't come back until about half an hour later. Suddenly she was on the mic, speaking in this very dry voice. "My name is Dita," she said, "and I'll be your mistress tonight." I knew that the original "Erotica" would never be the same again, and it wasn't. The chorus and bridge were changed entirely and the whole psyche of the song became sexier, more to the point. It seemed as if Dita brought out the beast in her, actually serving as a vehicle for the dangerous territory she was traveling. Actually, it was the name Madonna used when she'd stay in hotels around the world. Not anymore.

When July 10 came, I felt my thirty-something years hit me full-force. It

*continued on page 108*

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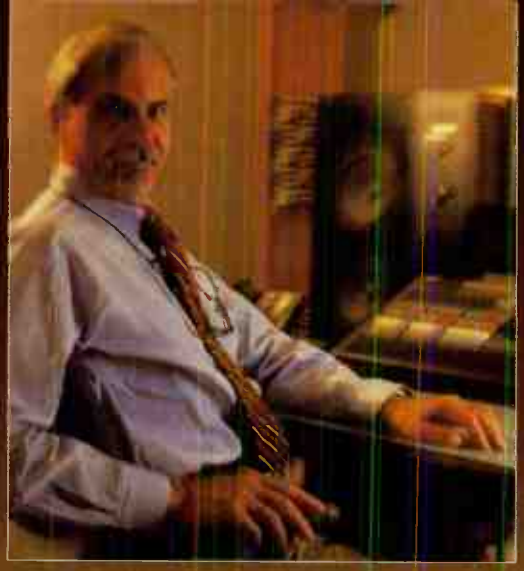

# Jack Renner and the ATM35 on Bass, Brass, and all that jazz!

Jack Renner needs little introduction. As co-founder, Chairman, and Chief Engineer of Telarc International he has been nominated 11 times and won 5 Grammies just for classical engineering alone. Jack Renner and the Telarc team pioneered digital orchestral recording and the minimalist microphone technique that is now the standard for premium-quality classical CDs.

But when Jack recently decided to create a series of jazz CDs to complement the superb Telarc classical library, he knew – from his years of location recording – that he would need a new approach to solve the difficult acoustic and performance problems posed by live recording in jazz night clubs.

After an intensive search, he has found exactly the string bass sound he needs...with the Audio-Technica ATM35. This small cardioid condenser microphone can be clipped directly to the instrument. Its unique mount is readily positioned for best balance and consistent level all night long.

The cardioid capsule can also be easily replaced with an omni element when needed. Its low noise is impressive and the smooth extended response is both realistic and musical. Everyone loves the results: the musicians, the technicians, the record buyers, and Jack. But he also found the ATM35 has another role to play.

When Jack Renner clips the ATM35 to a trumpet or trombone he finds it equally musical, even with very intense playing. He gets very low distortion and noise and consistent high quality no matter how much the musicians move around. Jack's goal of recording brass exactly as it is heard in live performance has been met simply and precisely.

He notes that while the microphone is actually quite close to the instrument it sounds farther away, with acoustic "air" that provides an amazingly natural perspective. And the ATM35 offers almost no restriction to the freedom of movement and expression that is so important to live jazz.

Location photos: Frank Micelotta

**Model ATM35**
**Cardioid Condenser Microphone**

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**Lionel Hampton** (Live at the Blue Note) *Milt Hinton,* bass
**Bobby Short** (Late Night at the Cafe Carlyle) *Beverly Peer,* bass
**Manhattan Mambo** sax, horns, vocals
**The Count Basie Orchestra** (Live at El Morocco) brass solos...and more releases in this live jazz series are due shortly.

Put the mighty little ATM35 to work today. Whether used for quality sound reinforcement or the most critical recording, this versatile microphone is outstanding. Just ask Jack Renner and Telarc! Write, phone, or fax for more details or see your Audio-Technica sound specialist today.

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World Radio History

# AES Review

*The following chart is your easy-to-use shopping guide for new recording and sound gear that was introduced at last fall's AES in San Francisco. Scan the next few pages for gear you can use and fill out this issue's Free Literature Card to receive more information directly from the manufacturers.*

| BRAND | MODEL | TYPE | DESCRIPTION | PRICE | TEL | LIT # |
|---|---|---|---|---|---|---|
| | DX 4000 | Digital system controller | Program cross sys. eq; time align delays | $[illegible]490 | | |
| Adamson Acoustic Design Corp. | UB1 | Loudspeaker | Compact, 2 way trapezoidal loudspeaker | $550 | 416-420-6279 | 121 |
| | AFM212 | Active floor monitor | 2 AW12 woofers; 50x40 deg. coverage Acoustic Waveguide | $1825 (no HF) | | |
| Akai | DD1000i | Disk-based digital audio editor | Stereo recorder/editor; removable MO disks | $14,995 | 817-336-5114 | 122 |
| | S01 | Digital sampler | 16-bit, 8-voice, multi-timbral sampler | $995 | | |
| AKG Acoustics, Inc. | Blue Line Series | Condenser mics | Modular mic components | N/A | 510-351-3500 | 123 |
| | Tri Power Series | Dynamic mics | Rugged, high-output stage mics with clean, clear top end | N/A | | |
| | BRC | Master remote control | Controls up to 16 ADATs; record track selection | N/A | | |
| Alesis | RMB | Remote meter bridge | Provides 32 channels of remote LED metering | N/A | 310-558-4530 | 109 |
| | AI-1 | Digital interface | Provides digital interface for interfacing ADAT | N/A | | |
| Allen & Heath | GL3 | Mixing console | For live sound reinforcement; 6 selectable aux. busses | From $3495 | 801-268-8400 | 124 |
| Altec Lansing Corporation | Acousta QWIK | Speaker design software | For architectural spaces; equipped with room model templates | $495 | 405-324-5311 | 125 |
| Amber Electro Design | 7000 | Measuring system | Analog and digital audio generator/analyzer | $15,000 | 514-333-8748 | 126 |
| | 5500 | Prog measuring system | Front panel controllable; modular construction | $6,900 | | |
| | Einstein Super E | Mixing console | A large frame/patchbay version of the AMEK Einstein | $65,000 | | |
| AMEK/TAC | TAC SR6500 | Monitor SR5600 companion | All modules are designed for foldback | $49,500 | 818-508-9788 | 127 |
| | 9098 | Mixing console | Designed by Rupert Neve | $500,000 | | |
| Ampex Recording Media | 489DM | Digital audio mastering tape | S-VHS tape for audio digital master recording | N/A | 415-367-2457 | 128 |
| Anatek | RADAR | Multitrack digital recorder | 24-track digital recorder in 4 space rackmount case | $15,000/24 tr | 800-665-4175 | 110 |
| Aphex Systems | 104 | Aural Exciter | Aural Exciter with Big Bottom | $349 | 818-767-2929 | 129 |
| | Legacy Series | Mixing console | Modular discrete console | $125-$900,000 | | |
| API Audio Products | "Six Pack" 500-B6 | Powered rack | Six-slot version of the API Lunchbox | $849 | 703-455-8188 | 130 |
| | 525b | Signal processor | Compressor/limiter gate-de-esser | $1,195 | | |
| | AE-8B | Stage monitor | High-output floor monitor | $2,640 | | |
| Apogee Sound, Inc. | CRQ-12 | Parametric EQ | Parametric EQ with 2 outputs and 6 filters per channel | $2,680 | 707-778-8887 | 131 |
| | MPTS-1 | Cinema System | MPTS-1 is a five-channel cinema and postproduction system | $18,000 | | |
| A.R.A.S. Marketing, Inc. | X-S2 | Digital audio processor card | 1 x AES/EBU/SPDIF input; 1 x AES/EBU/SPDIF output | $3,999 | 313-572-0500 | 132 |
| | X-S4 | Digital audio processor card | 1 x AES/EBU/SPDIF input; 2 x AES/EBU/SPDIF output | $5,499 | | |
| ART | Phantom Series | Professional consoles | 16-, 24-, and 32-input config; 4-band EQ; 8 Aux | N/A | 716-436-2720 | 133 |
| Ashly Audio, Inc. | CFT-1800 | Convection cooled amp | MOS-FET amplifier with 300 watt/channel | TBA | 716-544-5191 | 134 |
| ATM Fly-Ware | AMFS-DML1122-T | Hardware-flying array | AMFS series loudspeaker flying system for EV DML1122 | $150 | 310-639-8282 | 135 |
| | AMFS-DML1152-T | Hardware-flying array | AMFS series loudspeaker flying system for EV DML1152 | $154 | | |
| ATR Service Co. | ATR-LB | Conversion kit | Upgrades an Ampex ATR-104 to do 1" Type C Audio | $6,995 | 415-574-1165 | 136 |
| | CM-50 | Auto locator | For Studer, Ampex, Toscam, Fostex and Otari recorders | $1,090 | | |
| AudioControl Industrial | PCA-200 | Signal processor | Subharmonic synthesizer with complete controls | $299 | 206-775-8461 | 137 |
| Audiomation, Inc. | 990M/913 | Uptown automation kit | Opto-isolation interface kit to handle 8 faders | $200 | 508-443-8053 | 138 |
| | 990M/911 | Control panel | Control panel for 990 Uptown Automation System | $200 | | |
| Audiomation, Inc. | 600 | Uptown Automation | Screen-based moving faders | $7,000 | 508-443-8053 | 138 |
| Audio Precision | Fastrig | DSP Software | For audio quality measurements | N/A | 503-627-0832 | 139 |
| | Engineered Series | Microphones | Mini and sub-mini mics for pro sound | N/A | | |
| Audio-Technica | PRO 43R | Mini boundary microphone | Small and inconspicuous with a controlled unidirectional | N/A | 216-686-2600 | 140 |
| | AT808G | Talk-back microphone | Over 12dB of rejection from the rear | N/A | | |
| | D Series | Microphones | Transformerless, dynamic mics for instrument miking | $249-289 | | |
| Audix Corporation | Speakers | Powered speakers | 25 watts/channel for mixdown and playback | $429 pr | 510-828-7529 | 141 |
| | HRM-3a | Speakers | Double 6 1/2" woofer and proprietary dome tweeter | $899 pr | | |
| Aurica Sound Labs | Analog technology | Patented circuitry | Allowing extension of bandwidth beyond 300 kHz | N/A | 408-241-2600 | 142 |
| | ELF-1 | Dual channel integrator | Low frequency integrator | $2,388 | | |
| Bag End Loudspeaker | S18E-C | Single 18" ELF loudspeaker | Super quick 18" transducer in a sealed, compact | $598 | 708-382-4550 | 143 |
| | TA12jr-O | Time Aligned® loudspeaker | Oak veneer version of two way, Time Aligned loudspeaker | $690 | | |
| BBE Sound | 862 Maximizer | Sound Enhancer | Dual channel unit with low contour and process controls | $599 | 714-897-6766 | 144 |
| | 386 | Acoustic instrument pre-amp | High impedance input; parametric EQ; notch filter | $299 | | |
| BEC Technologies | AudioPlex AD16 | Digital transmission | 16 channel A/D transmitter | $3,000 | 206-632-2431 | 113 |
| BEC Technologies | AudioPlex DA16 | Digital transmission | 16 channel D/A receiver/repeater | $3,000 | 206-632-2431 | 113 |
| BEC Technologies | DataPlex FBII | Fiber optic transceiver module | Handles up to 4 AD16s and 4 DA16s | $1,800 | 206-632-2431 | 113 |



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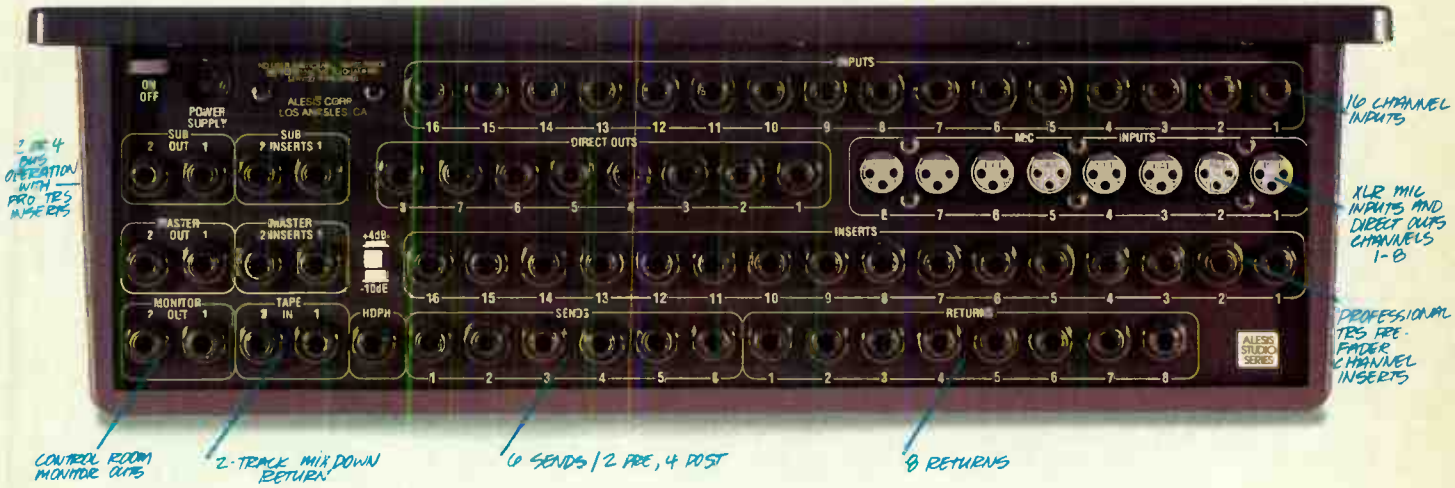
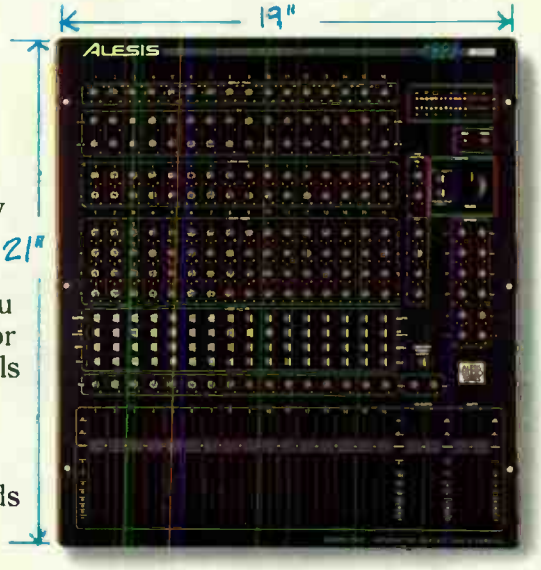
# 16 Channels, 4 Busses, 6 Sends, 8 Returns, 20 True Inserts. $899




Flexibility is the horsepower behind any professional recording mixer. You need all the channels, sends, returns and inserts you can get your hands on in the heat of a mix. Check out these front and rear panel shots of the Alesis 1622 and you'll see professional features that make other mixers pale by comparison.




To suit your tracking needs you can set up for 2 bus/2 master or 4 bus operation. All 16 channels have 6 sends: 2 pre-fader for your choice of dual mono or stereo monitoring and 4 post-fader for effects. Use all 6 sends for effects-heavy mixdowns or set up three separate monitor mixes plus 4 effects for a live recording. And the 8 returns handle any combination of stereo or mono sources.

Every channel and all 4 busses feature professional TRS inserts for individual processors.

And they're true pre-fader inserts so you can change levels without disturbing critical effects settings. Master outputs are switchable +4 or -10 to drive pro or semi-pro mixdown decks, and channels 1 through 8 feature XLR mic inputs and direct outs. There's even a headphone output for convenience.

All this flexibility wouldn't mean anything if the 1622 didn't sound great. Specs like "distortion plus noise: too low to measure"*, and the cleanest, quietest signal path we could possibly devise, truly put the 1622 in a class by itself. In fact, it's the absolute best mixer under $2000 for recording with our ADAT Digital Audio Recorder. Your ears will prove this.

Flexibility, superb audio, unbeatable price. Ultimate value. See your Alesis dealer for a demo and start mixing today.

*Keyboard Magazine July '90

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016

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ALESIS STUDIO ELECTRONICS

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| BRAND | MODEL | TYPE | DESCRIPTION | PRICE | TEL | LIT # |
|---|---|---|---|---|---|---|
| beyerdynamic | MC834 | Large diaphragm condenser mic | Cardioid vocal and instrument mic w/3 position roll-off | $999 | 516-293-3200 | 145 |
| | DT150 | Monitoring headphone | 5-35 kHz response; ambient noise isolation; rugged | $199 | | |
| | MCE87VS | Shotgun microphone | Condenser shotgun mic for video camera interface | $299 | | |
| BGW Systems | SPA-2 | Signal processing amplifier | Two-way amplifier; crossovers; delays, parametric EQ | $2,199 | 310-973-8090 | 146 |
| | U86 | Computer | Rack mountable 386/486 PC computer | $3,995 | | |
| Bruel & Kjaer | APE Series | For B&K 4003 and 4006 mics | Function as spatial and spectral EQs | N/A | 519-745-1158 | 147 |
| | 4011 | Cardioid microphone | Designed to deliver accurate pattern characteristics | N/A | | |
| BSS | FCS-920 | Slave unit | Up to 32 ch of a parametric EQ | N/A | 510-351-3500 | 148 |
| Carver Corporation | PDR-10 | Compact disk recorder | CDR with AES/EBU in/out serial/parallel remote | $8,500 | 206-775-1202 | 149 |
| | PMCX-1 | Active crossover network | Stereo 2 way/mono 3 way-4 way onboard limiters | $899 | | |
| Circuits Maximus | CMCI ITE-20 | Wearable monitors | In-the-ear wearable stage monitors | $479 | 703-276-0125 | 150 |
| | 1000 Series | Wired stage monitor system | Stage box and control beltpack for monitors | $1,500 | | |
| CM Automation | MX-816 | Mixing automation | 16 channels of rack mount automation | $780 | 818-709-4020 | 151 |
| | FX-100 | Automation control console | 100 millimeter automated faders | $449 | | |
| | MIDI Mix | Software (Mac) | Automation control software for Macintosh | $379 | | |
| Community Pro Sound Sys | N-Series FB | Nearfield loudspeaker | 3-way trapezoidal live/playback | $1,340 | 215-876-3400 | 152 |
| | R5 Jr | Reinforcement loudspeaker | LF/1-12"; MF/2-6 1/2"; LF/2-6 1/2" HF/1-1" | $745 | | |
| | RS660 | Reinforcement loudspeaker | Compact 3-way trapezoidal live/playback | $1,863 | | |
| Connectronics Corp | PCHI | Patch cord manager | Hand turned in hard wood | $63 | 203-375-5577 | 153 |
| | JB22 MJ | Patchbay | 44 point, normal, 1/2 normal or straight | $207:14 | | |
| Cooper Sound Systems | CSPA-1 | Mic preamp | A battery operated, two-channel mic preamp | from $990 | 714-248-1361 | 154 |
| | Aux module DS-1 | For CS 106 + 1 audio mixer | Converts CS 106 + 1 into a 6 x 4 + aux mixer | $895 | | |
| Crest Audio, Inc. | Century GT | Front-of-house mixing console | 16 to 52 inputs; 4-band sweepable EQ; two Matrix Mix out | $5- $30,000 | 201-909-8700 | 111 |
| | Century SP | Sound reinforcement console | 16 to 52 inputs; 8 Aux Mix buses; full function returns | $5 - $30,000 | | |
| | Century LM | Monitor mixing consoles | 16 to 52 inputs; mono and stereo designs | $5- $30,000 | | |
| Crown International | MA-5000VZ | Power amplifier | 5,000 watts of power; takes up only 3 rack spaces | $3,295 | 219-294-8000 | 155 |
| | Power-Tech 1 | Power amplifier | Delivers over 300 watts per channel into 4 ohms | $1,049 | | |
| | Power-Tech 2 | Power amplifier | Delivers over 400 watts per channel into 4 ohms | $1,299 | | |
| Crystal Semiconductor | CS5389 | Analog-to-digital converter | 107 dB, stereo 18 bit $\Delta\Sigma$ A/D converter | $42 in 100s | 512-445-7222 | 156 |
| | CS4303 | Digital-to-analog converter | 107 dB, stereo 18 bit $\Delta\Sigma$ D/A converter | $29 in 1000s | | |

Cause.




World Radio History

| BRAND | MODEL | TYPE | DESCRIPTION | PRICE | TEL | LIT # |
|---|---|---|---|---|---|---|
| CTI Audio, Inc. | CAD Equitek E-200 | Multi-potterned microphone | 3 patterns - Omni, Figure 8, Cardioid | N/A | 800-762-9266 | 157 |
| | MegaMix Series | Automation system | Transparent VCA circuit, easy user interface | N/A | | |
| dbx Professional | 172 SuperGate | Gate, expander, ducker | Full-featured professional gate | $869 | 510-351-3500 | 116 |
| | 760x | Mic preamplifier | 2 channels; phantom power and polarity | $349 | | |
| | 120XP | Subharmonic synthesizer | Separate subwoofer out; built-in crossover; 2 control bands | $299 | | |
| DDA | Forum "PA" | 8-bus console | 24 to 40 inputs | $11,995/24ins | 516-249-3660 | 158 |
| | Forum "Motrix" | 8 bus console with 8x8 matrix | 24 to 40 inputs | $12,995/24ins | | |
| | Forum Composer | 24-track recording console | 24 to 40 inputs; 24 track monitoring | $14,500/24ins | | |
| Demeter Amplification | VT275HF | Tube power amplifier | All-tube, 75 watt-per-channel power amplifier | $1,795 | 818-986-7103 | 159 |
| Denon America, Inc. | DTR-80PR | Portable DAT | Digital I/O, mic input | $900 | 201-575-7810 | 160 |
| | DN-961FA | CD player | Reads Orange Book CDs | $1,350 | | |
| Desper Products, Inc. | Spatializer | Real-time processor | 24-channel 360 degree real-time virtual imaging system | $8,450 | 818-986-9673 | 161 |
| DIC Digital | CDR-63 | Compact disc | 63-minute recordable compact disc; holds 540 MB of data | $38 | 201-244-9344 | 162 |
| | CDR-74 | Compact disc | 74-minute recordable compact disc | $40 | | |
| | AR-4000 | DAT drive cleaner | Non-abrasive, dry DAT drive cleaner | $15 | | |
| Digidesign | Expansion Chassis | Pro Tools accessory | 12-slot NuBus card chassis for Digidesign cards | $2,295 | 415-688-0600 | 163 |
| | ProMaster 20 | 2-channel editing system | 20-bit version of Sound Tools II | $5,995 | | |
| | DINR | Noise Reduction software | For ProMaster 20, Sound Tools II, and Pro Tools | $995 | | |
| Digital Audio Labs | Ver. 3 of EdDitor | Software | New Windows 3.1 version of hard-disk editing software | $250 | 612-473-7626 | 164 |
| Digital Expressions | SoftSplice | Digital audio editor | 4 tracks; built-in DSP; SMPTE support | $2,995 | 206-389-9895 | 165 |
| Digital F/X | Digital Master EX | Digital audio workstation | 4-channel recorder/editor | $4,995 | 415-961-2800 | 166 |
| | WaveFrame 401 | Digital audio workstation | 8-channel recorder, editor, and mixer | $14,995 | | |
| DigiTech | TSR-24 | Digital reverb | Programmable, hardware/software expandable reverb | $800 | 801-268-8400 | 167 |
| | DHP-55 | Harmony processor | Dual DSP, 5-part oversampled harmony processor | $995 | | |
| | Vocalist II | Human voice processor | Five-part human voice processor | $799 | | |
| Dolby Laboratories | 740 | Spectral processor | 2-channel dynamic EQ | $1,760 | 415-558-0270 | 168 |
| Doremi Labs, Inc. | DAWN II | Digital Audio Workstation | All-digital version of original DAWN | N/A | 818-966-2454 | 169 |
| Dynocord | DRP15 | Multi effects processor | 24-bit signal processing; 17 different basic effects | $1,495 | 516-249-3660 | 170 |
| Dynatek Automation | MMS Series | Multiple media system | 34 rackmount data storage depot | $3000 /$8000 | 416-636-3000 | 171 |
| | Raider | High capacity array | Free standing hard disk array, up to 10GB capacity | $20-$40,000 | | |
| | CDO | Data storage | 24 storage subsystem incorporates CD-ROM | $3,500 | | |


1. What would independent multiple effects be like if you couldn't apply them separately to the different inputs? Like Rogers without Hammerstein.

2. True stereo inputs let you do two independent reverbs at once at once. Got it got it?

3. Also because of true stereo inputs, you'll have both gate and ambient reverb to play around with simultaneously.

4. Can you say *ambience*? Then you can also simulate the use of an ambient microphone while recording.

5. You'll not only be able to utilize up to five independent delay lines, but also set intervals up to two seconds apiece without compromise.

6. How do four independent pitch shifters, each with a four octave range, sound? Great, that's how.

7. Join this rotary club and you'll simulate a classic rotating speaker with separate rise/fall times for the lows and highs.

8. Severely detuned signals. Mild flanging. And everything in between. Ladies and gentlemen, the SE-50's stereo flanger.

9. For a mild phase to one that's truly radical, the stereo phaser is sure to come in handy.

10. Plug a mic into one input and a keyboard into another and you're set for vocoder.

11. Shhh! The SE-50's noise suppressor is about to kick in.

12. Having separate EQ and noise suppressors per input is one thing. Being able to add reverb, delay and chorus to either or both is quite a cool other.

**Effects.**

13. The SE-50's chorus recalls the renowned Roland space chorus circuitry.

14. Naturally, you'll be able to call up the classic gated reverb effect with the SE-50.

15. The compressor evens out dynamic levels and produces more sustain on your guitar.

16. For everything from heavy metal to blues to country, the SE-50 is ready to kick into overdrive or even distortion.

17. You've also got a line driver with the SE-50. Drive carefully.

18. The limiter prevents clipping or overloading on a mixer, an amplifier or even a tape recorder.

19. To simulate panning, move this magazine from one ear to the other while flipping the pages.

20. Add more high end, more low end—you know, more clarity—with the SE-50's enhancer.

21. Need enough reverb to fill a small room? How about the Royal Philharmonic Amphitheater?

Now consider you'll have 28 powerful preset algorithms for combining up to eight effects simultaneously, full MIDI control, not to mention 128 memories. All in a sleek half-rack design.

The SE-50 Stereo Effects Processor, part of the BOSS Pro Series.

It could effect you in a serious way.

BOSS

BOSS, Roland Corporation US,
7200 Dominion Circle, Los Angeles, CA
90040-3647. 213 685-5141.

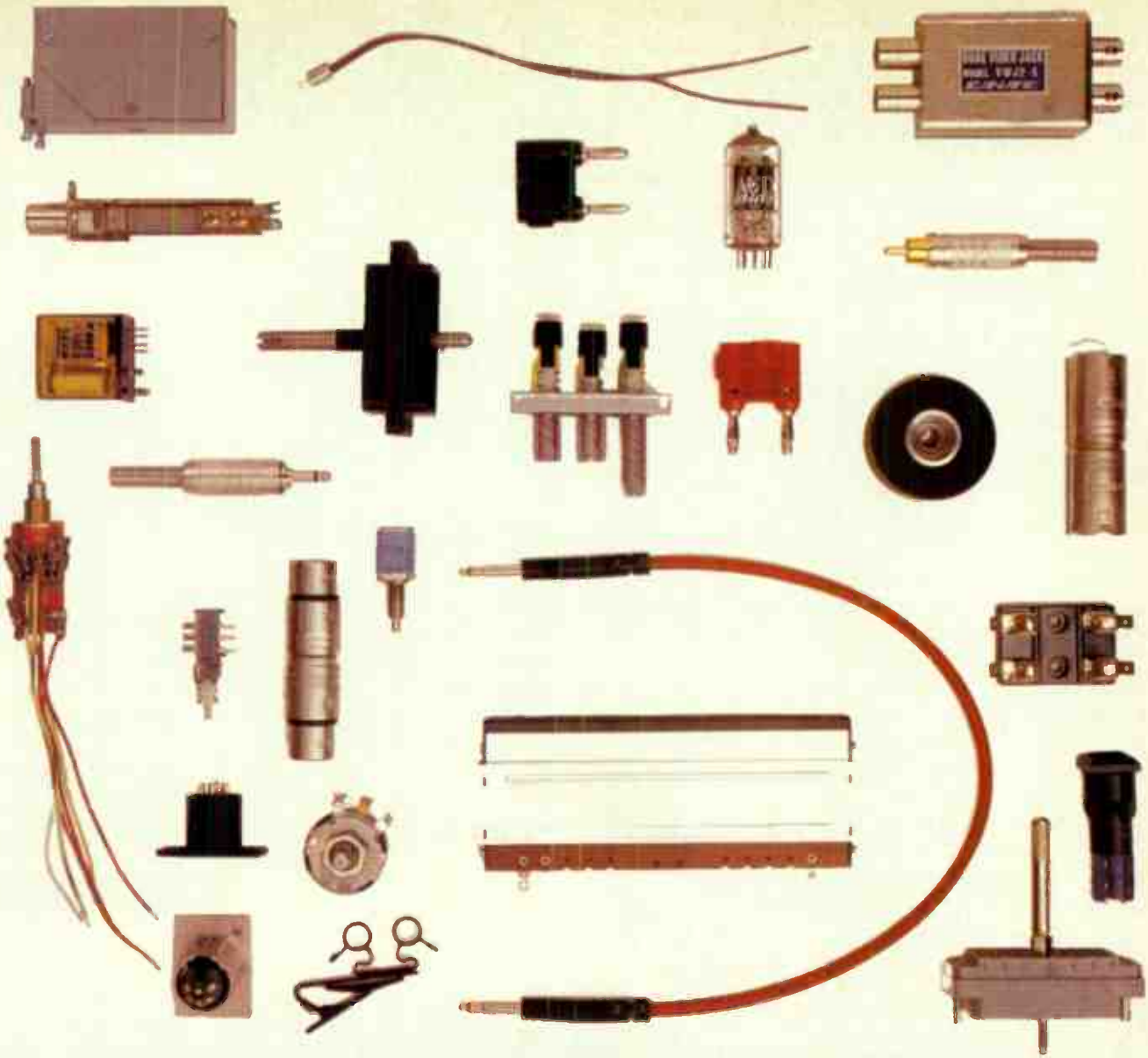
CIRCLE 54 ON FREE INFO CARD


World Radio History

| BRAND | MODEL | TYPE | DESCRIPTION | PRICE | TEL | LIT # |
|---|---|---|---|---|---|---|
| East West/Soundwarehouse | EW-040 | CD/CD-ROM | Drums 2, the sequel to the sample library, Drums 1 | $129/$399 | 213-848-3436 | 172 |
| EAW | MH Series | Engineered sound systems | Virtual array mid/high systems | $1950 - $2900 | | |
| | JF Series | Ultra-compact full range | High output yet extremely compact | $495 - $1650 | 508-234-6158 | 173 |
| | KF691i | Virtual array system | 90 degree horizontal coverage | $2,695 | | |
| E-Mu Systems, Inc. | SP-1200 | Sampling percussion system | 12-bit digital sampling drum machine | $2,795 | 408-438-1921 | 174 |
| | Emulator IIIxp | Digital sample editing software | For the EIIIxp digital sampling system | $3,995 | | |
| Euphonix | The Cube | Modular analog routing matrix | Adds aux sends, mix buses, and electronic patchbay | From $15,000 | 818-766-1666 | 175 |
| Eventide | DSP-4000 | Effects processor | Digital I/O harmonizer with reverb; AES/EBU; SMPTE | $5,000 | 201-641-1200 | 102 |
| Fostex America | DCM-100 MIXTAB | Digitally controlled mixer | MIDI-controllable mixing system | N/A | 310-921-1112 | 106 |
| | MC-102 | Mixer | Rackmount mixer with cassette | N/A | | |
| Frazier | F1620/F1630 | Loudspeaker systems | 60" x 40" coaxial system/90" x 40" coaxial system | $2960 ea. | 501-727-5543 | 176 |
| Gefen Systems | Pioneer CAC-V3000 | 300 CDs autochanger | Library storage for CS sound effects | $6,000 | 818-884-6294 | 177 |
| Gold Line | DSP-30 | Audio spectrum analyzer | Portable 1/3 octave RTA w/ 85 dB window | $1,500 | 203-938-2588 | 178 |
| | APT-2 | Phase/polarity analyzer | Analyzer to read phase/polarity | $249 | | |
| Gotham Audio | UM 92S | Microphone | Microtech Gefell studio condenser microphone | $2,295 | 212-765-3410 | 179 |
| | DC 1 | Digital signal processor | Cedar Audio De-Clicker | $19,995 | | |
| Groove Tubes | MP-1 and MP-1s | Vacuum tube mic preamp | XLR input; DB-9 input for the Groove Tubes Model One | $650/$1200 | | |
| | ST-1 | "Shock Therapy" microphone | 5" dia. alum. basket w/2 rubber-lined clamps | $65 | 818-361-4500 | 180 |
| | PS-1 and PS-2 | Vacuum tube power supplies | For use with Model One vacuum tube mic | $150/$250 | | |
| Hafler Pro | Trans Nova 9300 | Power amplifier | Three stage amp as opposed to typical 5 stages | $1,200 | 800-366-1619 | 181 |
| | Trans Nova 9500 | Power amplifier | Three stage amp as opposed to typical 5 stages | $1,800 | 800-366-1619 | |
| HEDCO | ASR-8X8 | Audio serial router | Stereo 8x8 router module for the X plus Series | $995 | 800-231-9673 | 182 |
| HME/Portland | 1000 | Integrator | Intercom | $1,500 | 818-500-0137 | 183 |
| | 700-16B | HME | Intercom handset; new optional venture | $105 | | |
| Hush Systems | Hush ISP | Intelligent sound processor | Noise reduction, compression, dynamic enhancement | $439 | 313-853-3055 | 184 |
| Innovative Electronic Designs | 4400 | Automatic microphone mixer | 4 gated and 1 auxiliary inputs; 1 RIA rackspace | $1,392 | 502-267-7436 | 185 |
| | 4800 | Automatic microphone mixer | 8 gated and 2 auxiliary inputs | $3,045 | | |
| JBL | 4893 | Compact subwoofer system | Addition to the Array Series System | N/A | 818-893-8411 | 186 |
| | 4894 | Two-way loudspeaker system | Addition to the Array Series System | N/A | | |
| | M712 | Compressor/limiter | Control of Threshold, Ratio, Attack, Release | N/A | | |
| Jensen Transformers | 68 JT | Rack-mount record electronics | For Magna-Tech | $2k per ch | 213-876-0059 | 187 |
| JLCooper Electronics | PRO3700 | Automation upgrade package | Upgrade for the Tascam M-3700 recording console. | $995 | 310-213-3064 | 188 |
| | dataSYNC | MIDI time code synchronizer | Designed to work with Alesis ADAT. | $349 | | |
| | SoftMix | Soundcraft Spirit automation | Record MIDI events, automate up to 16 software subgroups | $500 | | |
| Josephson Engineering | C-700A | Studio condenser microphone | Dual-capsule, variable-pattern microphone | $2,400 | 408-238-6062 | 189 |
| JRF Magnetic | Otari DP1610 | Cassette QC assembly | Fully adjustable head assembly for track placement | $395 | 201-579-5773 | 190 |
| | Ampex | Replacement heads | Flux magnetic heads for most Ampex machines | N/A | | |
| JVC | XD-PIPRO | Portable DAT | Portable DAT; no SCMS; digital mic | N/A | 201-794-3900 | 107 |
| KABA Research and Develop | RTDS-4CD | CD source for cassette dup | 4-track doubletime duplication of audio cassettes | $825 | 415-883-5041 | 191 |
| | 55-RHA-LC | Record heads | Longer life (5x); low cross-talk heads (15 dB better) | $250 | | |
| | RTDS-4CA | Master controller | 4-channel distribution amp flat to 80 kHz | $1,195 | | |
| Klark-Teknik | DN728 | Digital audio delay line | Delay line with 64 memories; 18-bit AD/DA conversion | $3,295 | 516-249-3660 | 192 |
| | DN800 | Configurable active crossover | Stereo 3-way or 4-channel 2-way | $1,995 | | |
| Klipsch and Associates | K-1132 | Compression driver | New technology features space-age materials | $417 | 501-777-6751 | 193 |
| | 9040/6040/4020 | Large format horns | Hybrid Tractrix technology | $583- $747 | | |
| Korg USA | Soundlink V 2.0 | Digital audio workstation | 8-track random access recording and editing system | $37,000 | 516-333-9100 | 194 |
| | Marshall JMP1 | Programmable tube preamp | 100 great Marshall sounds in a box | $999 | | |
| KRK Monitoring Sys | 7000 | Nearfield monitor | 2-way, very accurate nearfield monitor | $989 | 714-841-1600 | 195 |
| | 9000 | Nearfield monitor | 2-way, phase-coherent, accurate nearfield monitor | $1,750 | | |
| | 13000 | Midfield monitor | 3-way, phase coherent monitor achieving SPL of 112 dB | $2,699 | | |
| Kurzweil | K2000R | Rack module | Incorporates sample playback | $2,895 | 617-890-2929 | 196 |
| Lectrosonics, Inc. | DR195 | Wireless receiver | Ratio diversity UHF/VHF wireless mic receiver | $3,800 | 505-892-4501 | 197 |
| | T195 | Wireless transmitter | Hand-held UHF/VHF wireless mic transmitter | $1,600 | | |
| | DC1 | Audio signal processor | Digitally controlled processor | $2,395 | | |
| Leitch Incorporated | ADA-881MB | Audio distribution amplifier | Standalone audio D/A with 8 low-impedance outputs | $315 | 800-231-9673 | 198 |
| | ADA-883MB | Stereo distribution amp | 2 channels with 4 low-impedance outputs per channel | $355 | | |
| | ATG-880MB | Audio tone generator mix box | Standalone with stable switch-selectable audio tones | $320 | | |
| Lexicon | 20/20 AD | Analog-to-digital converter | 2-channel; 20-bit/4-channel; 18-bit | $3,495 | 617-736-0300 | 199 |
| Magdio America, Inc. | DXR-15-45-125 | DAT tape | Customized DAT length | $4.50 - $8.50 | 714-595-0136 | 200 |
| Marantz Professional Products | PMD740 | Six ch mixer/four tr recorder | Four balanced mic connections, four insert points dbx, HX Pro | $899 | 708-820-4800 | 201 |
| | CDR600 | Compact disc recording system | Rack mountable unit, full Philips Orange Book compatibility | $7,500 | | |
| | PMD700 | Portable DAT recorder | 4x2.5x8.5"; under 3lbs, 1-bit A/D conversion at 48kHz | $2,500 | | |



World Radio History



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CIRCLE 15 ON FREE INFO CARD

World Radio History

| BRAND | MODEL | TYPE | DESCRIPTION | PRICE | TEL | LIT # |
|---|---|---|---|---|---|---|
| Mark of the Unicorn | UNISYN | Software | Universal editor/librarian for the Macintosh | $395 | 617-576-2760 | 202 |
| Marshall Electronics | 3080 | Microphone cable | AES/EBU digital microphone cable | $0.38 per foot | | |
| | 3082 | Mogami speaker cable | CL-2 14 gauge OFC coaxial cable | $0.42 per foot | 310-390-6608 | 203 |
| | 3076 | Mogami SCSI II cable | Long distance computer cable and assemblies | $1.10 per foot | | |
| Martech/Martinsound | EMT-140 | Upgrade | Electronics, transducer, and cabling upgrade for EMT plates | $2,495 | 818-281-3555 | 204 |
| | EMT | Vibration damper | Mounting bases to absorb floor vibration | $250 pr | | |
| Medio Technologies | DCC Mastering | Mastering/text editing | Basic timecode and PQ codes used for DCC | N/A | 516-563-1721 | 205 |
| Metrosoft | MetraTracks | Software | Multitrack software for NeXT | $595 | 619-488-9411 | 206 |
| Meyer Sound | HD-2 | Studio monitor | High definition mid-field monitor | $6,000 | 510-486-1166 | 207 |
| Nady Systems, Inc. | 950 UHF | Wireless mic system | Ten-channel UHF rackmount with 120 dB dynamic range | $2,496 | | |
| | RW-3 UHF | Wireless mic system | Four-channel UHF rackmount with 120 dB dynamic range | $996 | 510-652-2411 | 208 |
| | 301 UHF | Wireless mic system | Four-channel UHF with 120 dB dynamic range | $800 | | |
| Nagra/Phi Technologies | NAGRA-D | Digital field recorder | Portable, 8-channel digital tape machine | N/A | 405-521-9000 | 209 |
| | Nagra T- | Audio timecode | 2-channel, center track timecode | N/A | | |
| Neotek | Esprit | Mixing console | 8 Group busses; mix minuses | $23,900> | 312-929-6699 | 210 |
| Neumann (USA) | KU 100 | Binaural microphone | Third generation dummy head: "Fritz III" | $5,995 | | |
| | KFM 100 | Stereo microphone | Spherical-surface stereo microphone | $5,595 | 203-434-9190 | 211 |
| | U 67 | Tube microphone | Reissue of classic tube microphone | $4,995 | | |
| Neutrik USA, Inc. | A2 | Audio test equipment | Dual channel audio generator/analyzer | $5,900 | | |
| | Combo | Audio connector | The first XLR and 1/4" jack in one connector | N/A | 908-901-9488 | 212 |
| | Bantam patch cords | Patch cords | One-, two- and three-foot pre-assembled patch cords | N/A | | |
| NVISION, Inc. | NV5000 | Master sync generator | Locks to NTSC, PAL, AES/EB, and SDIF-2 | $7,500 | 916-265-1000 | 213 |
| Opcode Systems, Inc. | Galaxy V 1.2.2 | Macintosh MIDI software | Integrated universal librarian with editors for MIDI devices | $399 | | |
| | StudioVision, V 1.4 | Macintosh MIDI software | Integrated MIDI sequencer with digital recording/editing | $995 | 415-856-3333 | 214 |
| | Studio 4 | Mac MIDI interface/processor | 8-in/10-out, 128-channel MIDI interface | $495 | | |
| Optical Media International | TOPIX | CD recording system | Desktop CD recorder and software | $10,000 | 408-376-3571 | 215 |
| Otari Corporation | DTR-90T | R-DAT recorder | 4-heads; offers tape monitoring as well as insert editing | $8,995 | | |
| | CB-149 | Editor | Provides simultaneous edit control of two DTR-90Ts | $3,695 | 415-341-5900 | 216 |
| | 4.0 upgrade | ProDisk software upgrade | GUIDE operating system and visual display | N/A | | |
| Paktec Automation | JC7000 | J-Card/U-Card inserter | Assembles J-Card or U-Card at 100 pieces per minute | $29,900 | 206-745-5580 | 217 |

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Add super bass PUNCH™ to your mix or sound reinforcement system with Furman's PUNCH-10 Bass Enhancement System. No mere equalizer, the PUNCH-10 is a true subharmonic processor that actually *creates* bass content by synthesizing harmonics one octave below the original bass. It takes you from bass you can hear to bass you can *FEEL!* The PUNCH-10 includes a limiter for speaker protection.

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CIRCLE 37 ON FREE INFO CARD


World Radio History

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We know better than anyone else how to make great sounding digital effects. That's why MIDIVERB III has 200 programs in 16 bit stereo with 15kHz bandwidth. And features the kind of programmability you need to create powerful mixes. All this and 4 effects at the same time make MIDIVERB III the first choice in digital processing.

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ALESIS
STUDIO ELECTRONICS

CIRCLE 06 ON FREE INFO CARD

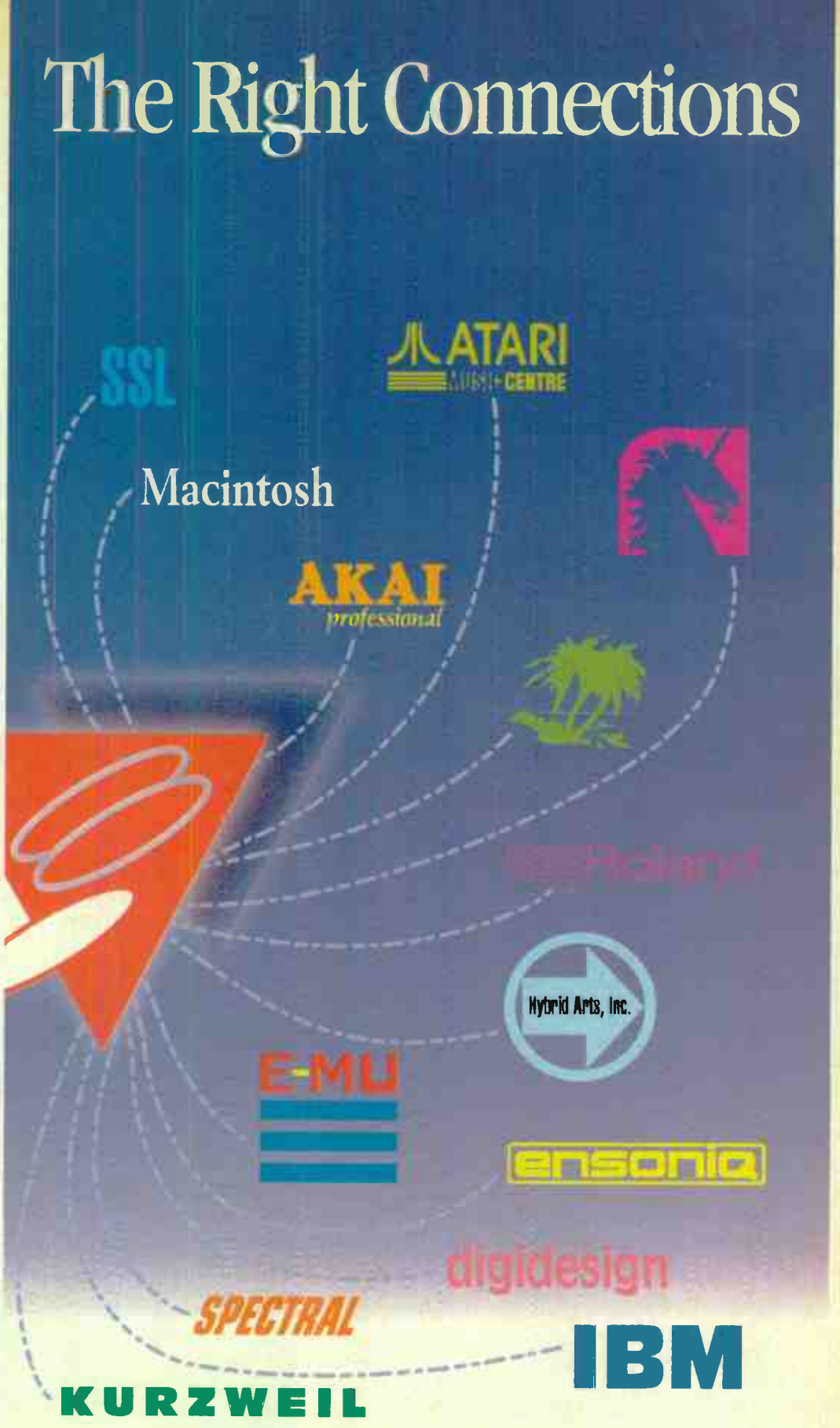
World Radio History

| BRAND | MODEL | TYPE | DESCRIPTION | PRICE | TEL | LIT # |
|---|---|---|---|---|---|---|
| Panasonic/Ramsa | WX-RP410/RP700 | ENG/EFP wireless microphone | Receiver and transmitter feature 30-channel selection | $4,800 | 201-348-7846 | 218 |
| | Ramsa WZ-DM30 | 20-bit digital multiprocessor | Comp/limiter, graphic eq, 4-way crossover,4-band para eq | $3,600 | | |
| Peavey Electronics | PRM 308Si | Nearfield studio monitor | 3-way reference monitor; switch-selectable response | $399.95 ea | 601-483-5365 | 219 |
| | DPM SXII | 16-bit stereo sampler | 256 kbytes on board, RAM expandable to 32 MB; | $400 | | |
| | APB 8000 | Audio patchbay | 64-input patch points; front panel jacks internally normalled | N/A | | |
| Penny and Giles, Inc. | PGF7000 | Endless belt output controller | 100mm stroke; belt with LED indicators under the belt | $70 | 310-452-4995 | 220 |
| Pro-Bel | 6510 | Digital audio analyzer | Measures and verifies the audio content and bitstream | $5,535 | 800-231-9673 | 221 |
| Professional Audio Systems | PermTech P100 | Loudspeaker (contractor) | Full range outdoor loudspeaker system | $499 | 619-591-0360 | 222 |
| | TOC tm S1-122M | Stage Loudspeaker | TOC system 12" coaxial stage monitor | $867 | | |
| QSC Audio Products, Inc. | USA Line | Professional power amplifiers | Includes three models, all with full complementary circuits | $578 to $998 | 714-754-6175 | 223 |
| | Q'SControl | Audio Control System | Uses Virtual Network Operating System (V-NOS) | N/A | | |
| Quested Monitoring Sys | Q208 | Nearfield monitor speaker | Compact 2-way nearfield monitor | N/A | 510-351-3500 | 226 |
| Q Up Arts | Heavy Hitters Hits | CD audio sound library | Over 350 heavy metal drum samples | $149 | 408-688-9524 | 224 |
| Radian Audio Engineering | MM8TA | Reference monitor speaker | Time-align, nearfield monioring system | $990 pr | 714-693-9277 | 225 |
| Rane Corporation | CM 86 | 8x4 compact mixer console | With 4 output buses and expandibility via Flex Bus | N/A | 206-355-6000 | 101 |
| | MAP 33 | Prog. acoustic inst. processor | 3 stereo ins for instrument mic with Phontom/Piezo Pickup | N/A | | |
| | FVL 22 | Flex VCA limiter | 2-ch remote level control interface w/limiters each channel | N/A | | |
| Renkus-Heinz, Inc. | QUBE-2 | Two-way loudspeaker system | Coaxial; 15" woofer w/mounted 1" HF horn/driver | $788 | 714-250-0166 | 227 |
| | QUBE-STK | Two-way loudspeaker system | Constant beamwidth horn and 1" HF driver | $675 | | |
| Richmond Sound Design Ltd. | Stage Manager | Cue software for MIDI control | MIDI sequencer for live performance | N/A | 604-732-1234 | 228 |
| | MMC-16 | MIDI-to-contact converter card | Uses SET command of MSC for 27 contact outs; | $2,034 | | |
| Roland Pro Audio/Video Group | SRC-2 | Dual sample rate converter | Mixes 2 stereo digital signals at different rates | $2,595 | 213-685-5141 | 104 |
| | DM-80-L | Locking Resolver | Locks DM-80's sample clock to SMPTE frame edge | $995 | | |
| | SP-700 | Sample playback module | Access to CD-ROM Sample Archive via SCSI | $2,895 | | |
| Roldex Industries | MIK-2 | Multi function silk screener | Silkscreens on a flat surface from video down to DAT | $22,500 | 818-504-6294 | 229 |
| RPG Diffusor Systems, Inc. | Omniffusor | Fibreglass reinforced gypsum | 2' x 2; non-combustible wall or ceiling mounted | N/A | 301-249-0044 | 230 |
| | VAMPS | Modular performance shell | Available in portable, rollable, or fully rigged formats | N/A | | |
| RSP Technologies | Intelliverb | 24-bit virtual room processor | Virtual Room reverberation effects | $1,299 | 313-853-3055 | 231 |
| | Studio Gate | Quad noise gate | 4 gates with individual wide range controls | $379 | | |
| | Studio Q | Four-band parametric equalizer | Offers state variable symmetrical peak/dip filtering | $379 | | |
| Russian Dragon | RD-R | Timing accuracy meter | Measures timing accuracy of 2 sounds; polarity check buttons | $499 | 512-525-0719 | 232 |
| Sabine Musical Manf | FBX-1200 | Feedback Exterminator | DSP-based filtering device with 12 independent filters | N/A | 904-371-3829 | 233 |
| | FBX-900 | Feedback Exterminator | Spectral variation <± 1.5dB, 20Hz to 17,000Hz | $600 | | |
| Saki Magnetics | VPR 2 A/B | Audio post 1" | Replaces Ampex metal heads with ferrite | $795 each | 818-880-4054 | 234 |
| | VPR 6 R/P | Audio post 1" | Heads with 6x life expectancy | $795 each | | |
| | VPR 80 R/P | Audio post 1" | Heads with 6x life expectancy | $795 each | | |
| Samson Technologies | 2242 | Mixer | 22 inputs, 4-bus, 4-band EQ; 6 aux sends; left/right bus | $1,130 | 516-932-3810 | 235 |
| | VRS/VTS | Selectable VHF wireless | 74 available frequencies, 11 for simultaneous use | N/A | | |
| Sascom Marketing Group | Vitolizer | Signal processor | Psycho-acoustic equalizer | $1,500 | 416-420-3946 | 236 |
| | Optifile LC | Console automation | Retrofit console automation system | $7,800 | | |
| | Symphony II | Recording console | Raindirk's new console | N/A | | |
| Schoeps/Pasthorn Recordings | Schoeps CMC 6 | Microphone amplifier | 12-48V Universal phantom-powered amplifier body | $555 | 212-242-3737 | 237 |
| | Schoeps VST 62 | Stereo mic amplifier | 12-48V Universal phantom-powered amplifier body | $1,165 | | |
| | Schoeps AMS 22 | M-S stereo shockmount | Mid-side stereo elastic suspension | $189 | | |
| Sellmark Electronics | CPA-65B | Fader | 65mm conductive plastic | N/A | 508-443-8053 | 238 |
| | CP-601 | Rotary pot | Conductive plastic | N/A | | |
| | CP-2500 | Rotary pot | Conductive plastic | N/A | | |
| Sennheiser Electronics | EM 1046 | UHF receiver | 8-channel modular receiver | $59,698 | 203-434-9190 | 239 |
| | SK 50 | UHF transmitter | 50 mW transmitter | $3,165 | | |
| | SK 250 | UHF transmitter | 250 mW transmitter | $3,990 | | |
| Siemens Audio, Inc. | Neve Capricorn | Digital mixing console | Digital signal path, reset, dynamic automation, stereo pairing | N/A | 203-744-6230 | 240 |
| | SoundField MkV | New single-point mic system | Improved electronics, systems diagnostics, and ergonomics | $5,850 | | |
| Singular Solutions | A/D64x PRO | A/D converter | 2-channel 16-bit A/D w/mic preamp; audiophile quality | $1,395 | 818-792-9567 | 241 |
| Solid State Logic, Inc. | Scenaria | Digital a/v production system | Automated routing system and random access video | N/A | 212-315-1111 | 242 |
| Sonex Acoustical/illbruck | Custom colors | Acoustical foam | Now available in any color from pastels to neons | N/A | 800-662-0032 | 243 |
| | ProSPEC | Vinyl barriers for isolation | Provides same density as lead sheeting | N/A | | |
| Sonic Solutions | SonicNet | Network card | FDDI SCSI node with 100 MB network top | $4,500 | 415-485-4800 | 244 |
| | TimeTwist | Software option | Time compression/expansion without pitch change | $995 | | |
| Sony Corp. of America | DPS-F7 | Dynamic filter plus | Dynamic EQ; compression/limiter; exciter; tape simulation | $1,600 | 201-930-1000 | 112 |
| | PCM-2700A | DAT recorder | DAT recorder with 4 heads, fader start, and AES/EBU | $2,900 | | |
| | CDK-3600 | CD changer | Dual-transport 360 disc CD changer | $8-9000 | 201-930-1000 | 112 |
| Soundcraft USA | Delta SR | Four bus console | Available in 8-, 16-, 24- and 32-input versions | N/A | 818-893-8411 | 245 |



World Radio History

# The Right Connections

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| BRAND | MODEL | TYPE | DESCRIPTION | PRICE | TEL | LIT # |
|---|---|---|---|---|---|---|
| Soundcraft USA | Ven[illegible] | Console | Available in 16, 24, 32- and 40-input frame sizes | N/A | 818-893-8411 | 245 |
| | Sapphyre Patchbay | In-line recording console | Available in 20, 28, 36 or 44 sizes | N/A | 818-893-8411 | |
| Sound Ideas | Universal CD Library | Sound effects library | A classic collecton of motion picture sounds | $595 | 416-886-5000 | 246 |
| Soundtracs | Jade | Mixing console | DSP microprocessor technology; dual inputs on every module | $45k - $85k | | |
| | Solo Monitor | Mixing console | Designed for stage; 10 dedicated monitor sends | $6,000 | 516-932-3810 | 247 |
| | Tracmix II | Automation system | Fader/mute system for up to 64 ch locked to SMPTE | $10,000 | | |
| Spectral Synthesis, Inc. | StudioTracks V 1.5 | Software | Windows-based hard disk recorder/editor system | $1,295 | | |
| | ADAX 8818 | Digital audio conversion | 8 in/8 out A/D, D/A convertor | $4,000 | 206-487-2931 | 249 |
| | SynClock 6400 | Timing hardware | Studio timing reference convertor for digital audio | Price TBA | | |
| Stellavox Digital Audio | Stelladat | RDAT portable tape recorder | Demonstroted modular plug-in timecode board ($2000) | N/A | 703-378-1515 | 250 |
| Stewart Electronics | PA-1800 | Amplifier | A two rack space, 17 lb, 1800 watt power amplifier | $1,699 | 916-635-3011 | 251 |
| | PRO-DAC | Digital to analog converter | Single rack space digital to analog converter | $799 | | |
| Studer Revox | Dyaxis II | Hard disk-based multitrack | Allows real-time crossfades in all editing and recording modes | $28,950 | | |
| | D780 R-DAT | Digital R-DAT tape recorder | High spooling speeds of up to 400 times play speed | $7,400 | 615-254-5651 | 252 |
| | Dyaxis Lite | Hard disk recording/editing | Digital editor/controller w/tape type interface | $9,995 | | |
| Studiomaster, Inc. | P7 | Mixing console | MIDI inline recording console — 16x8x16 | $4,195 | | |
| | Diamond Pro Series | Mixing consoles | 16x4x2x1 live reinforcement console | $1,495 | 800-878-7883 | 253 |
| | Diamond Pro Series | Mixing console | 24x4x2x1 live reinforcement console | $1,995 | | |
| Summit Audio | MDSP-200 | Peak and average meter | Modular two-channel high resolution DSP-based meter | $495 | 408-395-2448 | 254 |
| | MMP-125 | Mic preamp | Vacuum tube modular mic preamp | $595 | | |
| Symetrix, Inc. | 601 | Digital voice processor | Mic or line level analog signals, converts to digital (18 bits) | $1,995 | | |
| | 421 | AGC-Leveler | AGC section maintains constant output level | $549 | 800-288-8855 | 117 |
| | 402 | Dual output delay | 1 input/2 output; >100dB dynamic range | $695 | | |
| Tannoy. | System 6 | Studio monitor | 8" reference dual concentric | $795 pr | 519-745-1158 | 255 |
| | PBM-5 | Playback monitor | 5" playback audio monitor | $295 pr | | |
| Tascam | DA-88 | 8-track digital multitrack | 8-track digital multitrack using 8mm format Hi8 tape | $4,499 | | |
| | RA-4000 | Digital recorder/editor | 2-channel, 4-track random access standalone dedicated unit | $5,499 | 213-726-0303 | 105 |
| | DA-60 | Synchronizable DAT | 4-head DAT recorder w/sync for the film, video,audio | $5,499 | | |
| TC Electronic | M5000 | Digital signal processor | User upgradeable processor w/AES/EBU, SMPTE, and MIDI | $4,240 | 805-373-1828 | 256 |
| TDK Electronics | DA-R16 | DAT cassette | Tailor-made for short running time studio applications | $9 | 516-625-0100 | 257 |
| | CD-W12 | Recordable compact disc | 63 minutes ofdirect-to-disc stereo recording | $30 | | |
| TAD | TCM-1121 | SR speaker | 2-way 10" system with Apaxial Array Technology | $4300 each | | |
| | TWM-1622 | Wedge monitor | 2-way 16" wedge monitor w/ Apaxial Array Technology | $4100 each | 310-952-2415 | 258 |
| | TWM-1122 | Wedge monitor | 2-way 10" wedge monitor w/ Apaxial Array Technology | $4500 each | | |
| Techron — Tef Products | AcoustaEQ | Software | For use with TEF 20 analyzer and a parametric EQ | $300 | 219-294-8000 | 259 |
| Telex Communications | ACC Series | Audio tape duplicator | Duplicator with expandability and audio level controls | $1800-$2600 | | |
| | Copyette 1.2.1 | Audio tape duplicator | Economy line duplicator | $419 | 612-884-4051 | 260 |
| | Copyette 1.2.3 | Audio tape duplicator | Economy line duplicator | $1,099 | | |
| TimeLine | Lynx-2 | Timecode module | Wide-band timecode reader | N/A | 619-727-3300 | 274 |
| Times One Amplifiers | RFM 500 | Mono block amplifier | 150 W into 8 ohms; 300 W into 4 ohms | $1,950 | 310-247-4848 | 261 |
| | PS 400 | Stereo amplifier | 125 W into 8 ohms; 250 W into 4 ohms | $1,595 | | |
| TOA Electronics | WT-780 | Wireless microphone system | The VHF unit operates between 168 MHz and 216 MHz | $498 | 415-588-2538 | 262 |
| Trident Audio USA | Trident 90 | Mixing console | 24 multitrack busses; 10 aux busses, in-line monitoring | $99,500 | 310-533-8900 | 263 |
| Tube-Tech | Tube-Tech LCA-2A | Tube stereo comp/limiter | Separate comp/limiter for each channel; after Fairchild 670 | $2,993 | 212-586-5989 | 264 |
| Turtle Beach Systems | Waves | Editing for Windows 3.1 | Cut/paste editing; 3-D freq analysis; 4 band para eq | $149 | 717-843-6916 | 265 |
| Valley Audio Products, Inc. | Autogate | Noise gate | Two-channel frequency selective noise gate | $679 | 800-800-4345 | 266 |
| | Advantage 310 | Noise and level meter | Av. RMS & Peak Detector Resp., 70 dB scale in two ranges | $399 | | |
| Vega | Q600 | Wireless intercom | A UHF Q-Plus wireless intercom system | $14,207 | 818-442-0782 | 267 |
| Westlake Audio, Inc. | 4 AWG Series | Low-resistance speaker cable | Contains 800 stronds of copper per wire | N/A | 805-499-3686 | 268 |
| Wireworks Corporation | TEN-4 | Tester | Speaker cable tester; Newtrik speakons and 1/4" connectors | $125 | | |
| | 8LS | Multipin latches | Broadway latching system; new style multipin latches | N/A | 908-686-7400 | 269 |
| | G5/160i | Connector | New multipin connector standard for cabling systems | N/A | | |
| Yamaha | PM4000M 44/52 | Mixing console | Stage monitor console, 22 mixes, 44 or 52 inputs | N/A | | |
| | MC3210M | Mixing console | Stage monitor console, 10 mixes, 2 aux, 32 inputs | $7,500 | 714-522-9011 | 270 |
| | MC2410M | Mixing console | Same as above, except 24-inputs | $5,700 | | |
| Yorkville Sound | Audiopro 1212 /16 | 1200 watt powered mixer | 12 and 16 channels respectively; weight less than 50lbs | $1212- $2449 | | |
| | EX-350 | 2-way BBC loaded | 1x12" with horn; 102 dB sensitivity | N/A | 716-297-2920 | 272 |
| | Aeroquip | Flying hardware options | 6,000 lb rating/trk; +10 to -25 degree cabinet pitch adjust | N/A | | |
| Zoom Corporation | 9001 | Multi-effects processor | 40 presets/40 user patches; 20 effect types | $399 | | |
| | 9120 | Sound environment processor | Stereo reverb, 99 recallable presets; 10 effect types | $599 | 415-873-5885 | 108 |
| | 9200 | Reverberation processor | 31 effects with up to 297 presets | $2,995 | | |



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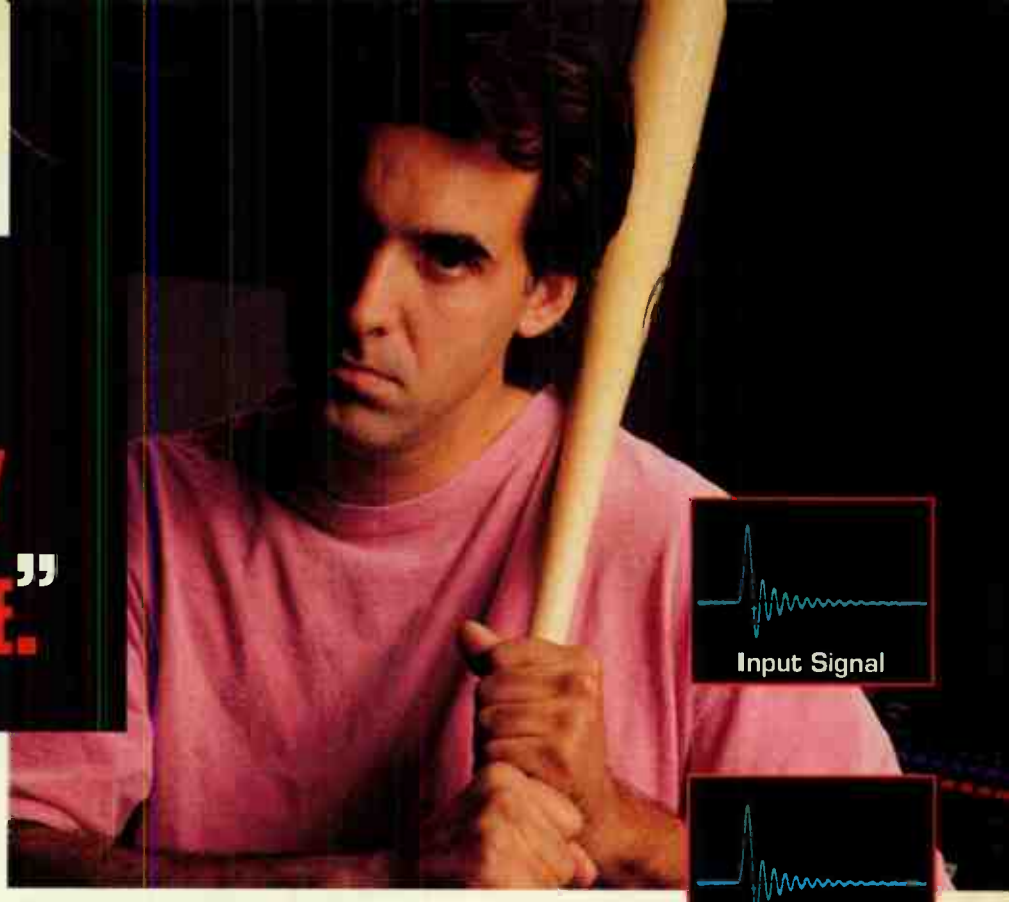

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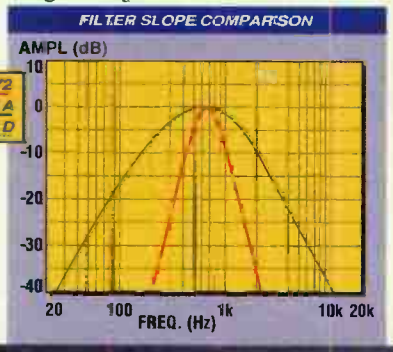


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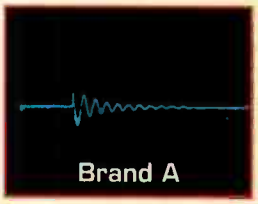

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# IN A BAND VAN

HIGH-FLYING GIGS PAGE 62

A SPECIAL SUPPLEMENT TO EQ MAGAZINE

## THIS IS SPINAL TAP SOUND

**INSIDE:** LIVE MIXING CONSOLES FOR LESS THAN $3000
MEET MY RACK: JASON SOUND & BRYAN ADAMS

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# STINKING UP THE GREAT INDOORS

**THE BAND THAT MAKES THE FANS SCREAM AND THE CRITICS CRINGE CELEBRATE 25 YEARS OF TAP**

**BY TONY SAVONA**

■WHEN THE NAME Spinal Tap is mentioned, people think of one thing. All right, *two* things — but we're not talking about an often-painful back examination here. We are talking about the legendary band popularized in Rob Reiner's mock-documentary *This Is Spinal Tap*, and that features comedians-cum-musicians Michael McKean as guitarist David St. Hubbins, Christopher Guest as lead guitarist Nigel Tufnel, Harry Shearer as bassist Derek Smalls, and more drummers than a percussionist's convention.

Throughout the years the group has given the world such memorable tunes as "Big Bottom," and "Christmas With The Devil," as well as the pungent "Stinking Up The Great Outdoors" and the profound "The Sun Never Sweats." Recently, the group finished a 10-week reunion tour in celebration of its 25th anniversary and their latest album, *Break Like The Wind*. The tour took Tap across America, up into Vancouver, Canada, and finally to a two-night homecoming stint at the prestigious Royal Albert Hall in London.

The group's house sound engineer, Gungi Paterson, said the beleaguered band's tour went pretty smoothly. "Of course," Paterson adds, "there was a constant fear that the drummer would explode at any second. Luckily, this never happened, although he did break his ankle and had to play half the tour using only one foot."

Paterson has worked with many of heavy metal's finest acts, including Judas Priest and Black Sabbath. His rack usually includes a large stable of gear (see the October 1991 *EQ*) but because Tap played in smaller venues, Paterson brought only a small part of his rig. Included in this abridged rack was a Yamaha PM3000 board, a Roland tape echo and 3000 digital delay, an AMS digital delay, and some gates and compressors.

His most important tools, Paterson explains, were the arsenal of Shure mics that he packed. "Tap's philosophy regarding their sound can be summed up simply: loud. Very loud. I needed microphones that could give a lot of gain before feedback, and the Shure Beta Series did the job."

Paterson used Beta 58 microphones to capture all of Tap's vocals and used AKG D12's on the guitar amps. Shure SM91A, SM98A, SM81, SM94, and Beta 57 mics were used on the drums. For the opening song, where the band flies in on wires and lands on the stage (oftentimes missing the stage entirely), Paterson used Shure LS114 wireless guitar systems.

A real challenge arrived in the form of Tufnel's custom-made Marshall amp — the JCM9000. "The JCM9000 is 12-feet high and has 24-inch speakers," recalls Paterson. "Nigel's old amp was able to go up to '11'; this one reaches *infinity*. Not only did we have trouble getting enough electricity to power the monster, but we needed a mic that could capture the full effect without distorting. Fortunately,

*continued on page 61*

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| Model | 4 ohms | 8 ohms | bridged mono |
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| Power-Tech 1 | 300 watts | 220 watts | 575 watts |
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IN A BAND VAN

# BOYS NEXT DOOR

**SOUND COMPANY:** Jason Sound, North Vancouver, British Columbia
**HEAD GUY:** Jeff Lilly
**ENGINEER:** Jody Perpick
**CURRENT PROJECT:** Bryan Adams *Waking Up The Neighbors* Tour
**CONSOLE:** Soundcraft Europa 48 x 8
**RACK:** Jeff Lilly explains, "We're using White 4700 programmable 1/3 octave equalizers and BSS FCS 926 programmable parametrics.

## MEET MY RACK

### JASON SOUND HELPS BRYAN ADAMS & COMPANY WAKE UP THE NEIGHBORS

# HOW TO GET FROM HERE...

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Rear-panel connections include Low-Z In, Loop Send/Return, Stereo Output (all audio connections are unbalanced 1/4-inch phone jacks), MIDI In and Out, and Remote In (for footswitch; compatible with Macintosh printer/modem cables). The front panel includes a hi-Z input that overrides the rear panel input jack and headphone jack. Power comes from a "wall wart" AC adapter.

### CHECKING OUT THE SOUNDS

One of the tests I like to do on a piece of gear is see how far I can get into editing without consulting the manual. The Zoom 9030 did well in that respect. As it turned out, I was able to select and edit patches with just a cursory skim of the manual.

Selecting patches is easy, in as much as there are two dedicated Patch Up/Down buttons. Since it takes a while to scroll all the way from 01 to 99, pressing on the Down button while pressing Up (or vice-versa) speeds up the scrolling.

The best user interface features are the four knobs that let you adjust four parameters per display page instead of the usual one (all right!). Although the knobs work best with tiny fingers, they beat scrolling through parameters and using a single slider.

The factory patches are very impressive, but tend to be melodramatic in spots—you go "wow" when you first hear them, but some aren't so usable in a musical context. Not to worry. I had no problem taming the patches into something a bit more "meat-and-potatoes" instead of ultrabright, swirling, animated nifty-keen special effects. One pleasant surprise: reverb, usually the weak point in multieffects, is surprisingly good, as is the pitch-shifting.

The editable parameters reflect a synthesizer designer's influence. The "Metallic" effect includes ring modulation, the tremolo incorporates multiple LFO waveforms, and several parameters respond to input level—not just the usual filter cutoff frequency, but also things like flange sweep, ring modulator attack, and pitch detuning. The last is great for nonperiodic chorus effects. There are also some truly novel effects, such as bomber (pick a note and hear a grainy, rumbling explosion) and zitar (a virtual sitar emulator—certainly not the real thing, but interesting, nonetheless).

Programs can be recalled by MIDI program change commands via four separate program change tables that match incoming commands to 9030 programs. An interesting "learn" mode lets you program the tables by sending program change commands from an external source (e.g., keyboard, footswitch).

Regarding continuous controllers, each page of parameters has an associated page that lets you pick one of the parameters (with some exceptions, such as delay time) for MIDI control, along with a controller number. The initial parameter setting determines one end of the controller sweep; a range parameter scales the incoming controller, positively or negatively, to add to or subtract from the initial value. The higher the range parameter, the greater the sweep.

Real time modulation controllers are 1-5, 8-31, 33-37, 40-69, 80-90, 92-95; 7 controls master volume, 70-78 turn the various effect groups on and off, and 91 bypasses all effects. This extra capability is welcome, although the 9030 does not respond to pitch bend or pressure data, nor do any parameters sync to MIDI clocks—admittedly a rare feature in signal processors, but one that would suit the 9030 well. Finally, there's a MIDI monitor that indicates the channel, controller number, and value of incoming changes—most handy.

Space prevents a detailed analysis, but Zoom offers the 8050 companion footswitch for remote control. It features 9 footswitches, and two inputs for expression pedals to change parameters in real time.

### OPINIONS

The Zoom 9030 packs a lot into its half-rack size. It sounds squeaky clean, and can make "gimmicky" as well as straightforward sounds. Of course, sound quality is very subjective — but running through the presets gives a good indication of what the unit can do. Programming is pretty easy, although some of the parameter abbreviations may seem cryptic until you become familiar with the unit, and the MIDI implementation is well-done. Overall, the 9030 will build on Zoom's reputation of providing good things in small packages.

*—Craig Anderton*


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# Boss EH-50 Stereo Enhancer

EQ LAB REPORT

**MANUFACTURER:** Boss, product of Roland Corporation US, 7200 Dominion Circle, Los Angeles, CA 90040-3647. Tel: 213-685-7141.

**APPLICATION:** Half-rack space signal processor that accepts instrument and line levels.

**SUMMARY:** Dual-channel enhancer and much more, including an EQ and instrument preamp.

**STRENGTHS:** 5 EQ presets, three dynamically controlled, plus an instrument preamp.

**WEAKNESSES:** Like all processors, this unit can be abused, so be cool.

**PRICE:** $260 **EQ FREE LIT. #:** 119

THE BOSS EH-50 is a dual-channel audio signal processor. While its name, "Stereo Enhancer," implies that it can modify the stereo image, "Enhancement" actually comes in five flavors of preset equalization: Presence, Voice, Attack, Expansion 1, and Expansion 2. The last three presets are also dynamically controlled by an expander.

## GLOBAL

The Enhance Level control adjusts the amount of processing as indicated by an LED bar graph. A pair of LEDs serve as overload indicators on the Left and Right channels. Processing can be switched in or out by the Enhance switch. Quarter-inch jacks access the inputs and outputs. The Left input also serves as a Mono mult to both channels.

## BONUS FEATURES

The EH-50 is capable of handling a wide range of input signals, from that of musical instruments (guitar, bass, etc.) to professional line levels. A switch on the rear panel selects between -10 and +4. The input circuitry includes an FET (Field Effect Transistor) that matches the input impedance with that of musical instruments. For this reason alone, the EH-50 serves as an effective preamplifier for such devices, preserving the full body of sounds they produce. A good alternative to a direct box, the EH-50 bypasses all of the additional circuitry of active DI's and mic pre's, getting the signal up to line level. From here you can go straight to multitrack, a fader input or a multieffect processor.

## EQ AND EXPANSION

Equalization is a very subjective area. What I prefer, you may not, and vice versa. I found Expansion 1 to be great for tired-sounding rhythm tracks. The EQ boosts the bottom and the top, the expander gives it punch. If you are bouncing tracks on a personal multitrack, this preset may be the ticket. If you have an overcompressed track, Expansion 2 is an across-the-board expander. Attack restores transients to percussive sounds.

The other two presets, Presence and Voice, are high-frequency boosters that help "lead" instruments and vocals, respectively, to cut through dense arrangements. I experimented with many different sources: drum samples, analog voice tracks, a Wurlitzer electric piano, bass guitar, and entire mixes.

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We have an array of compressor/limiters: Focusrite ISA-131's, Drawmer 1960's and DL 231's, and three BSS models — DPR 404's, DPR 402's, and DPR 901's. We're using Drawmer DS 201's along with the gates on the Europa console for gating and expansion. For reverb, we have Lexicon 480L's and LXP15's. To round out the system, we have Focusrite ISA 115DHP microphone preamp/ equalizers; a Carver PSD 36b CD player; Tascam DA-30 DAT recorder; and BSS TCS 804 time correction."

**LOUDSPEAKER SYSTEM:** "We use our own custom-designed J60 system that consists of five different loudspeakers. The J61 is a horn-loaded bass unit that employs two JBL 2241 drivers in a proprietary "push-pull" configuration. Full-power, low-frequency output is down to 35 Hz in a proper array. Each of the 24 J61's on the tour is powered by one channel of a Carver PT2400 amplifier. There are 22 J62's with us. These are low-frequency systems that cover 70 Hz to 170 Hz and feature two JBL 2240 drivers and can handle 1200 watts of continuous RMS power. Thirty-two J63's handle the mids and highs. These loudspeakers cover 170 Hz to 20 kHz through four JBL 2202, three JBL 2445+2380, and four JBL 2402-05 drivers. In addition to the J61s, we have 12 J1 sub systems which feature 2240 drivers. The J23 is a full-range, compact utility speaker that uses a JBL 2445J two-inch compression driver mated with a JBL 2380A flat front biradial horn and JBL 2202 low-frequency cone transducer. These enclosures are of trapezoidal design and we have 12 of them on the road with us."

**AMPLIFICATION:** Carver PM 1200's and PT 2400's. All Jason loudspeaker systems are powered by customized and calibrated Carver amplifiers.

**TIPS:** Lilly says, "It's important to make sure that the clients get what they need and want. And the system must be totally reliable. We designed this system together with Bryan. We've worked with Bryan for many years now, and we know what he likes and what he expects from us. At this level of touring, nothing can be left to chance, and when there's 15,000 people or more waiting for the show to start, we must have the highest level of confidence in our equipment."

## SPINAL TAP

*continued from page 58*

the Beta 57 did the trick."

Another hurdle presented itself at the Royal Albert Hall. In addition to the shows being taped for a television broadcast, the band wanted the distinct sounds produced by the hall's pipe organ. "The pipe organ is declared a national treasure," states Paterson, "and when some other guy went to record it, he bent some of the pipes. So now they won't let anybody near it. I had to mic *around* it — literally."

Despite the challenges and superloud sounds, Paterson is interested in working with Tap again. "They are a talented group of guys," he says. "Besides, Nigel is married to Jamie Lee Curtis, and it's always nice to see her walking around backstage."

...To Here

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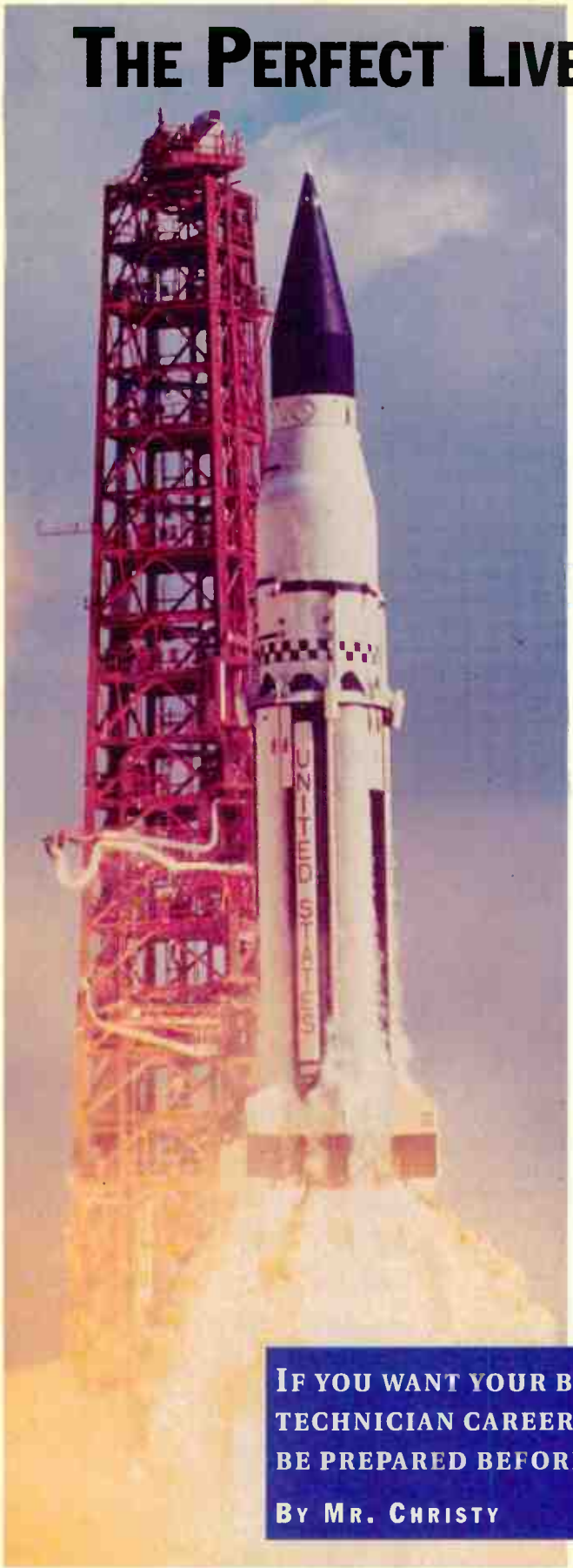
# THE PERFECT LIVE GIG COUNTDOWN




**IF YOU WANT YOUR BAND-IN-A-VAN-TECHNICIAN CAREER TO SOAR, BE PREPARED BEFORE THE LAUNCH**

**BY MR. CHRISTY**

■TO SOME experienced musicians (hundreds of gigs), sometimes a gig is so bad, it would have turned out better if you hadn't shown up! Every gig presents a new collection of variables that can test even the most seasoned performer, and the key to soaring over these obstacles is control over these variables. To help get things under control during blastoff, follow these tips during countdown.

### T-MINUS 7: THE RIG

• All equipment, regardless of cost or quality, must be periodically maintained and checked over for possible problems. Find a tech (or learn enough about your gear) to do regular maintenance.

• Separate and secure all cables in the back of any racks before going on the road. Cable ties with screw holes for mounting on wood or metal, which are available at electronic supply stores, are ideal for securing cables.

• Use clip lights to illuminate the back of a rack while setting up (I've often wondered why someone doesn't invent a light pack that illuminates the back of the rack, where it's dark, instead of the front).

• Use a three-ring binder to keep info on your equipment — reset procedures for microprocessor-controlled gear, repair records, schematics (worth their weight in gold on the road), etc. Owner's manuals and manufacturer/service facility/music store phone numbers are also useful. Trying to get a piece of gear repaired in an unfamiliar city is difficult; replacement equipment can be shipped out next-day air to many locations through UPS, Federal Express, DHL, or the US Postal Service.

### T-MINUS 6: POWER HOOKUPS

• Carry an adequate supply of power strips, long and short extension cords, and ground lifts (use these to isolate ground problems, not to keep grounds permanently lifted while playing). A power outlet beyond the reach of your gear can be disastrous.

• Before hooking up, test the AC outlets. Radio Shack makes a suitable tester for $5.99 (part number #22-101).

• Line filters and surge suppressors can prevent those embarrassing crashes of computer-based equipment (synths, drum machines, etc.). Check that any line conditioners have enough wattage to handle the load of your gear.

• A ground tree (see sidebar) can literally be a lifesaver by reducing the potential difference (voltage) between grounds on different pieces of gear. Nothing puts a damper on a guitarist's performance faster than being electrocuted.

• Though most top-quality venues have adequate power hookups, some clubs may try to cut costs by using anyone with a pulse to do wiring, rather than hiring an electrical contractor. This can lead to bizarre wiring problems. The most common ones due to bad AC lines are:

— Reversed polarity

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PHOTOS BY JOE SPIEGEL

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(neutral and hot lines are switched)

— One of the non-ground lines connects to ground

— There's a refrigerator, dimmer pack, or neon sign hooked up to the same circuit to which your gear connects (this causes a nasty 60 Hz buzz)

— Improper breaker rating or inadequate wiring (if your band hooks up and a fuse or circuit breaker blows, look out!)

**T-MINUS 5: CARRY SPARES**

The following crucial items are prone to breakdown or loss, so make sure you have spares:

- Fuses (keep a list of the fuse requirements for all of your equipment; tape a spare inside the case, for emergencies)
- IEC type (noncaptive) line cords
- Tubes
- Strings
- Picks
- Sticks
- Drum heads
- Microphones
- Cables, plugs, and jacks (never use jacks with plastic cases, go to the extra expense for metal)
- Batteries (to monitor battery life, keep a log and place a sticker showing the installation date on the side of each battery-powered device)
- Light bulbs for those remaining pieces of gear, such as optoelectronic footpedals, that don't use LEDs
- Power amps
- Speakers
- Disks, cartridges, and the other media used for synth patch storage

**T-MINUS 4: SET LIST**

Each band member (including the sound person and any techs) should have an accurate set list so that everyone starts together. Incidentally, the Nady Song Starter is a great tool; it gives a visual countdown for a song so that all band members can begin in sync.

**T-MINUS 3: MAPS**

This may sound obvious, but know where you're going *before* you get in the vehicle. Since group members are often coming from different directions, make sure they all have accurate

*continued on page 78*

## THE GROUND TREE

A ground tree is a central grounding location for all AC equipment on a particular circuit. Most AC receptacles are not grounded to earth ground, but to the circuit panel that, in turn (supposedly), goes to earth ground. Often, if there is a resistance between grounds on two lines, different voltages and ground loops can result, causing danger to the musician. Companies such as Furman Sound, Inc. (tel: 415-927-1225) make commercially available power supplies that properly ground equipment. Contact any of these companies for a products list, or consult with a good electrician on how to build your own ground tree.

# IDP is *not* a food preservative.

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**Sound Pressure Level:** 130 dB continuous; 136 dB peak

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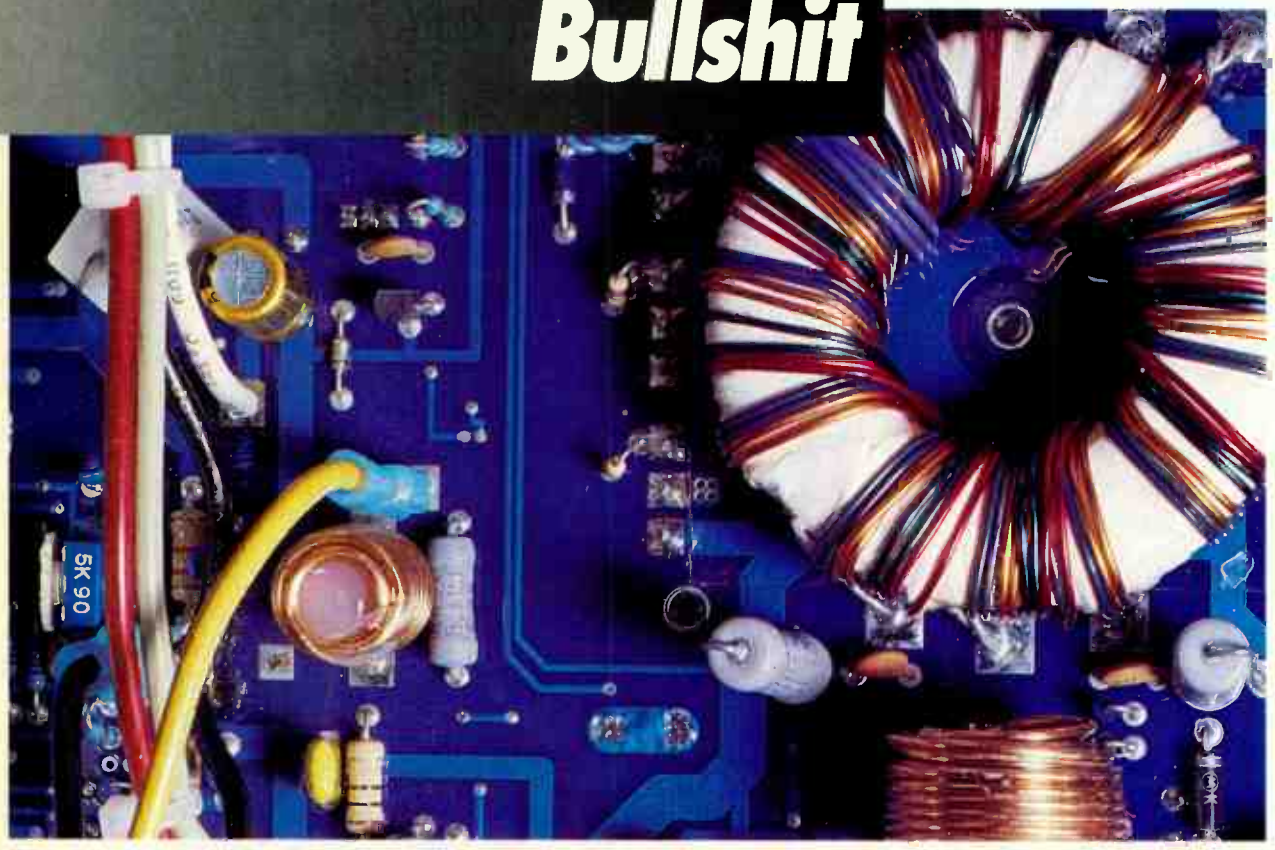


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IN A BAND VAN

# LIVE MIXING FOR $3000 OR LESS

## THE LATEST WORD IN ECONOMICAL MIXING CONSOLES

BY WADE MCGREGOR WITH HECTOR G. LATORRE

■SOMEBODY OUT there is listening. Say what you want about the music-electronics industry, but don't accuse it of not paying attention to the end user. At least not in recent years, and definitely not when it comes to mixing consoles.

During the past five years the industry realized that its consumers — across the spending spectrum — were becoming more sophisticated, more demanding. Nowhere was this more true than in the lower-spending brackets. Consequently, companies had to get serious about adding useful features, and, yes, quality too, to lower-priced equipment. Bands, live mixers, solo artists, and producers all needed greater technology and signal-path flexibility...at a very competitive price.

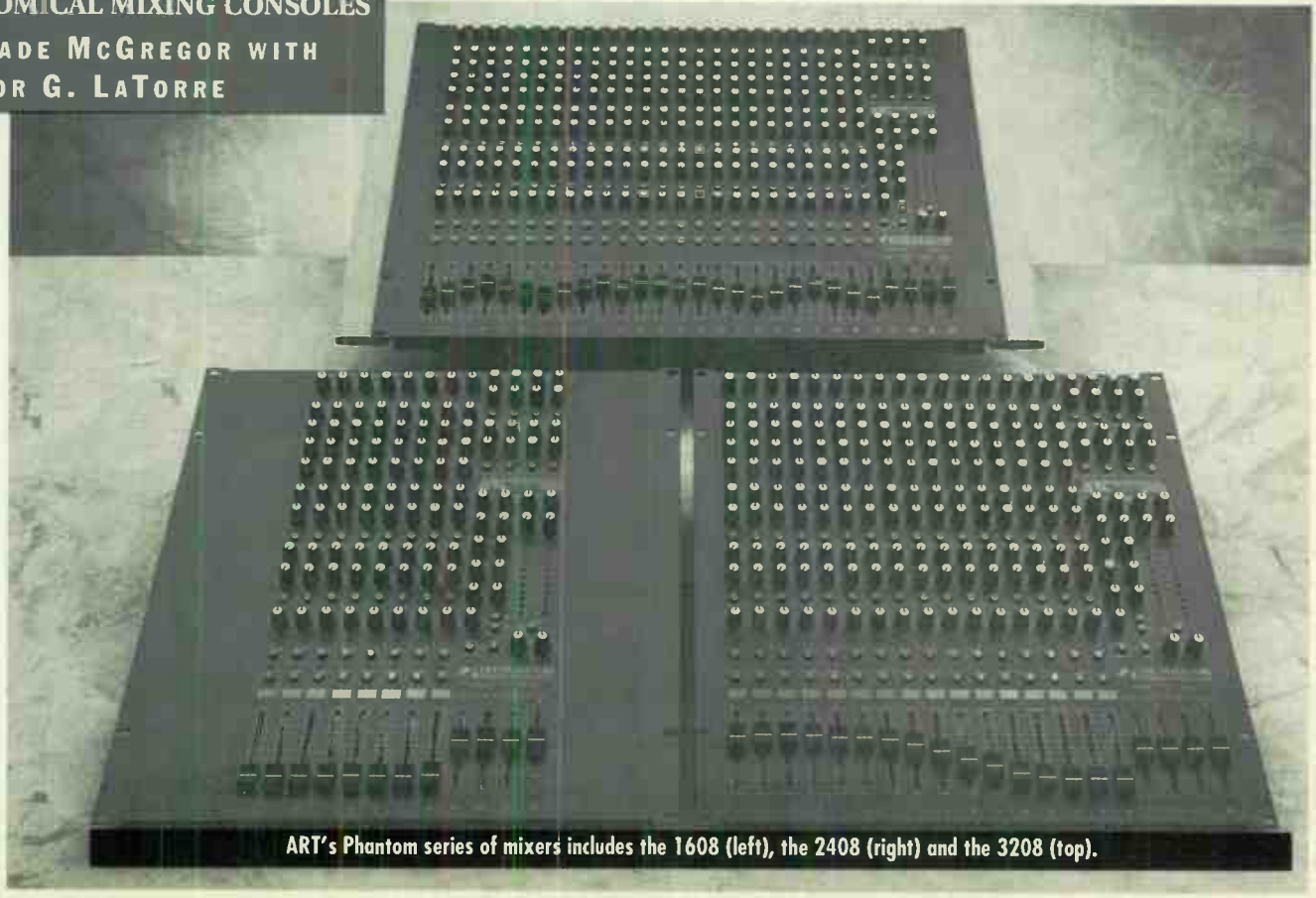
And now they've got it. Even low-range boards offer the power of sweepable EQ, and switchable pre/post aux sends — and even submasters. In addition, many of these consoles provide for both studio and live sound applications — a fact which adds to their value. A look at some of the latest low-cost mixers will give you an idea of just how far we've come.

### THE ART OF THE DEAL

Applied Research and Technology (ART) has been making very competitive and versatile signal processors for years. They recently used this expertise to build a series of compact, inexpensive mixers incorporating features for both recording and sound reinforcement. The Phantom series of mixers includes the 1608, with 8 balanced mic/line inputs and 8 auxiliary line inputs; the 2408, with 16 balanced mic/line inputs and 8 auxiliary line inputs; and the 3208, with 24 balanced mic/line inputs and 8 auxiliary line inputs. Inputs feature 4-band equalization, 8 auxiliary pre/post sends switchable between four level controls, phantom power for condenser mics, and input muting switches that mute both the mix bus and auxiliary sends.

The outputs can be configured into 4 subgroups. The master outputs also sum to a mono output so that controls are at hand for those situations where you have a central cluster or delay loudspeakers and must provide a convenient feed from your masters.

Distortion figures are very low, typically 0.007 percent, even in the most important signal path: from the mic input to the Main output. Noise buildup is still below -93 dB for that same signal path. Remarkable figures, especially for a mixer that includes an internal power supply. ART has given the all-important feature of roadworthiness special consideration in the design, including an all-steel chassis that can stand up to being thrown in and out of the band's van.



ART's Phantom series of mixers includes the 1608 (left), the 2408 (right) and the 3208 (top).

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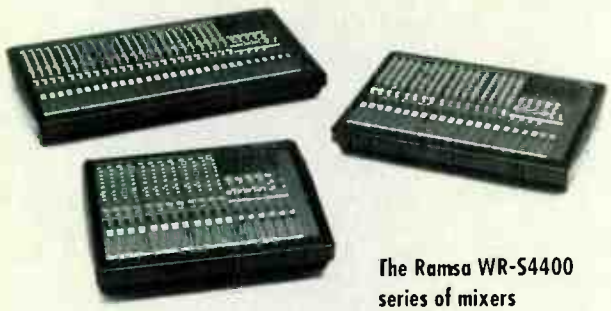
# IN A BAND VAN



The Ramsa WR-S4400 series of mixers

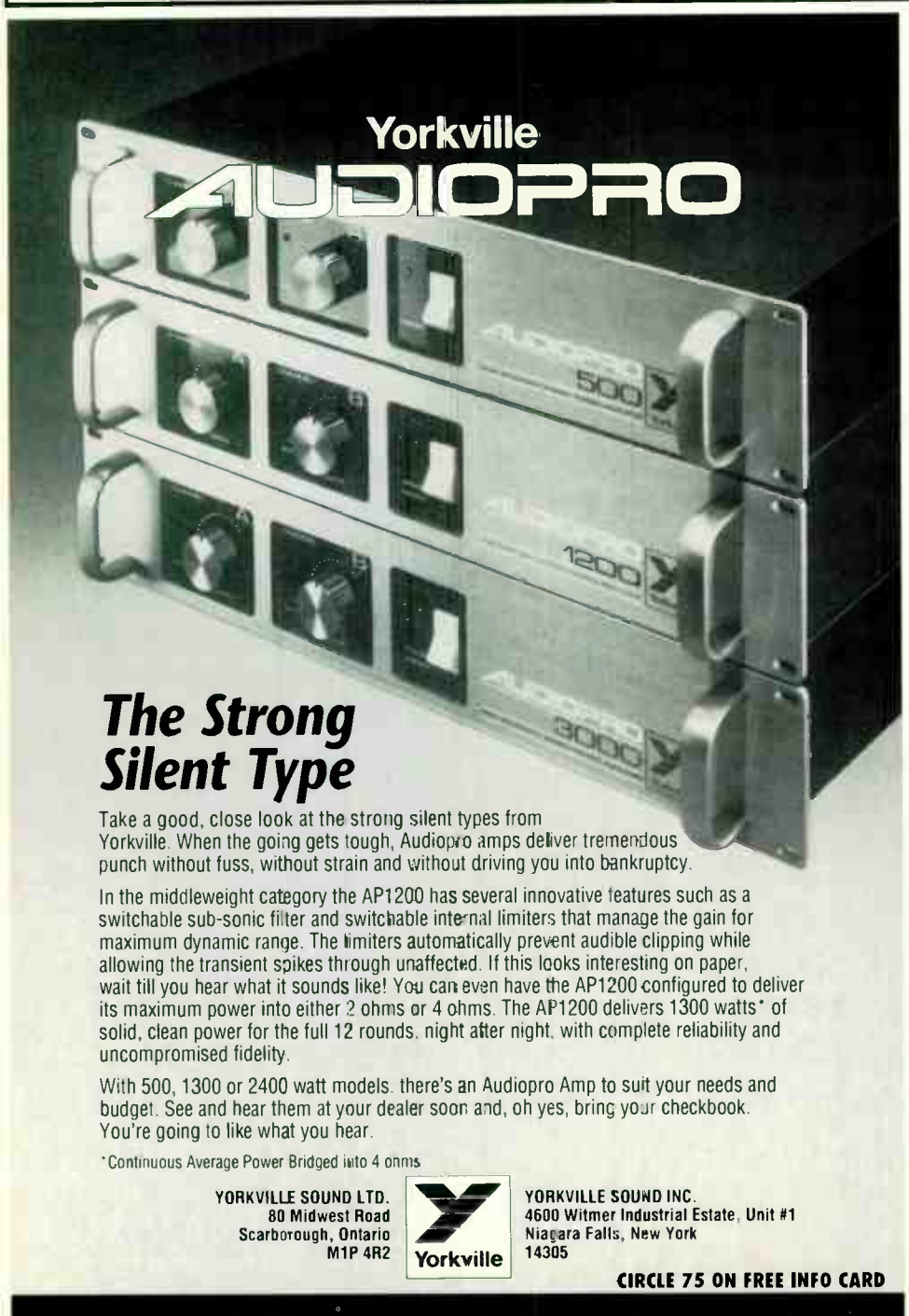
**BIG MACK(IE)**

Mackie Designs made a tremendous impact in the low-cost mixer market with its first mixer, the 1604. Now they are about to go into production on the new 8-Bus Series. Available in early '93, this new mixer offers a 16-input mixer with 8 sub-groups for less than $3000. The new 8-Bus series recording mixers are easily adapted to sound reinforcement use and feature a sweepable midrange EQ — the high-mid is fully parametric, adding a variable Q control. There are activity (-20 dB) and peak indicators on the inputs, just above the 100mm fader and mute switch. Channel assignments to pairs of submasters or the output masters allow flexible routing for more sophisticated FOH work. The balanced XLR main outputs are capable of up to +28 dB before clipping, which is very important when working with dynamic live performers. The 8-Bus mixers will also be available in 24- and 32-input versions.

**TWO FOR THE ROAD**

Yamaha has just upgraded its 4-bus sound reinforcement mixers, now called the MC04II series. Yamaha is well known for building robust mixers for touring, and the MC04II series uses many of the ideas from the more expensive Yamaha mixers. One of these features, unusual in this price range, is the matrix output. A 6 x 2 matrix mixer is fed from each of the group and master faders, allowing two independent mixes to be created for central clusters, backstage, or recording feeds. Another feature that can be very handy, especially for the warm-up act, is the ability to bus two consoles together without using up inputs or auxiliary returns. This can also allow all the PFL/solo audio to be carried through to the main mixer. The input channels include 4-band EQ with sweepable mids, a high-pass filter, 4 auxiliary sends, and inserts on input, groups and masters. The series starts at about $3000 and includes frames from 12 to 32 inputs.

The Ramsa WR-S4412/16/24 series of mixers features 100mm faders for mixing control of the 12,

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16 or 24 balanced inputs, 4 subgroup, and 2 master balanced XLR outputs. The wide gain-range (64 dB) of the inputs will allow a continuous control that accepts signals from low-level mics to line-level sources without resorting to input pads. A dedicated PFL meter allows the user to check signal levels throughout the mixer without losing sight of the output levels. The input equalization is 3-band, with sweepable midrange. Special care has been taken in the design of these mixers to reduce the switch breakthrough that has been known to cause problems — especially for very high-gain sound reinforcement systems. It is best to keep your muted channels out of the main mix, isn't it?

**BUT WAIT! THERE'S MORE**

There are a number of other mixers in this price range, such as the Ross Systems RCS802, 12, 16 and RCS2402 series; the TASCAM M1016 and M1024; the DOD Electronics 822, 1222, and 1642; and the Soundcraft Spirit Series, including the new Spirit 4, which adds 4 subgroups and 5 auxiliary sends to the list of Spirit features. Yorkville Sound has the AP series of mixers — from the AP208 to the AP216 — that also includes a digital effects processor.

Fostex has a series of recording consoles in this price range and has recently announced its new DCM-100 rack-mount audio mixer and MIXTAB. The MIXTAB is the controller with dedicated switches, knobs, and faders for sending MIDI control messages to the DCM-100. Using a long-distance MIDI link, this system could allow all of your audio signals to remain onstage and simply bring the controls (faders, EQ knobs, etc.) out into the audience for mixing. The future of live sound? The basic system with 8 stereo channels and snapshot automation is expected to cost less than $1400.

The Yamaha MC3204II mixing console is part of its MC04II series of mixers.


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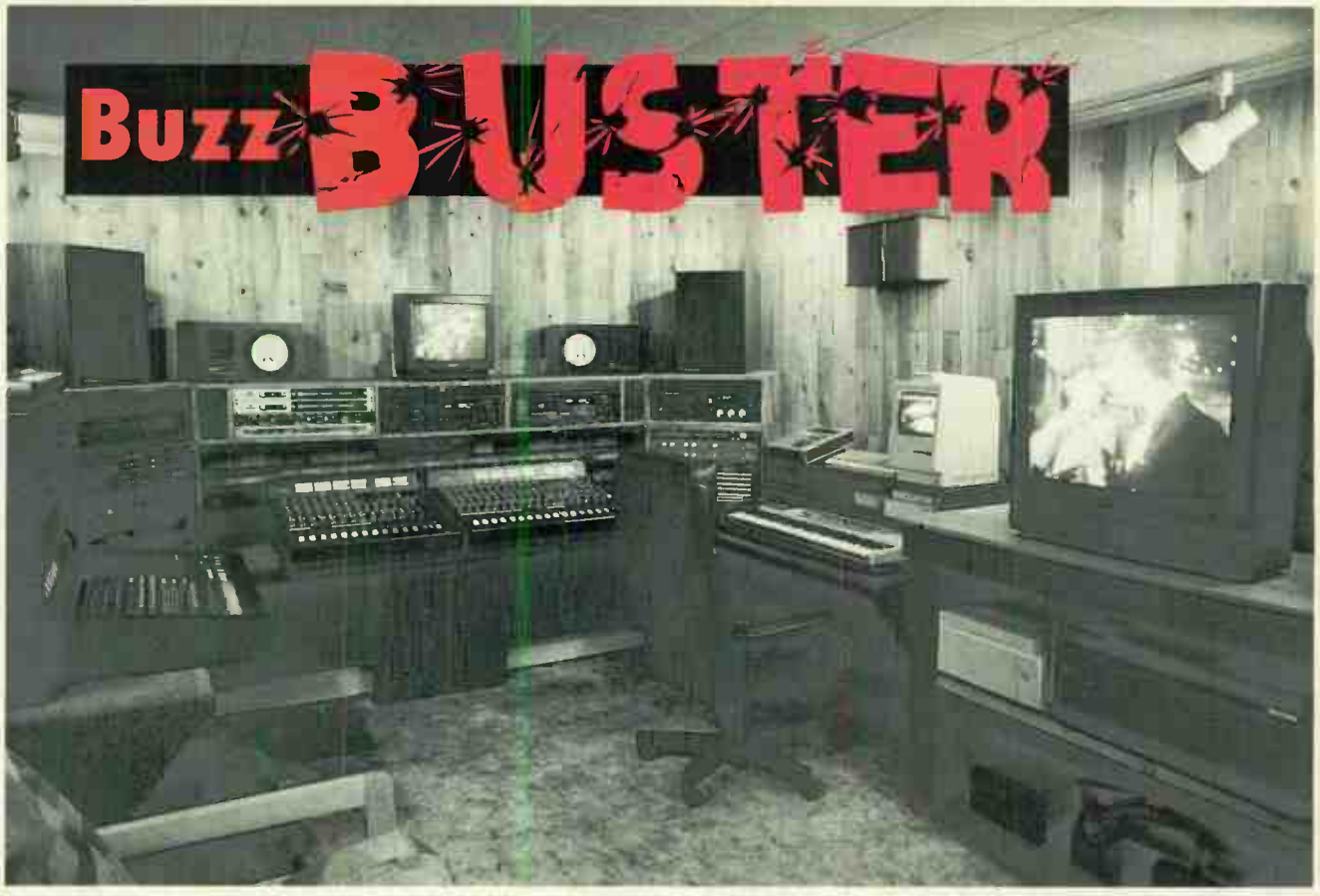
# BUZZ BUSTER



No, really, I don't get annoyed at everything. It just sometimes seems that I do. At times, being the owner of a mid-sized project studio, venting my emotions in a rather loud fashion on occasion seems like an inherent right of mine. Several months ago I found myself *quite* annoyed and I realized I had reached the point where a major technical overhaul was due.

## How I made my unbalanced studio virtually noise free

**BY JOHN CUBBIN**

First, a little background. Oxford Studio evolved over the course of about three years. When I found a good piece of equipment, used or on sale, that I needed and I had the funds available, I bought it. Through this method of equipping the studio, I developed several philosophies. One of which is: if keyboard X was good enough for hit records three years ago, I can put it to good use now. Don't get me wrong, I would not be opposed to owning all the hippest toys out there. But for me, building my studio has been a process of deciding on what I need, then going out and finding it at or under budget.

Throughout this evolution, I've always tried to keep my studio as quiet as possible. I always believed I had done a reasonable job of it. No out-of-control humming, buzzing, or other assorted nonsense. Then one day, after adding some new gear, I began hearing the dreaded buzz, or, more correctly, the dreaded buzzes. After spending too much time finding a relatively minor problem, I decided it was time to go through the entire studio from the ground up.

### TWISTS AND TURNS

The first thing I did was to empty all my racks and cabinets. It was amazing how, over a period of three years, all my cables — audio, power, MIDI, and video — had become severely knotted. After the untangling process, I realized that this project was going to be a little more involved than I had originally thought. Off I went to the local library and bookstores to arm myself with as much relevant material as I could find. Fortunately for me, a bookstore in my area carries almost the entire Howard Sams catalog, a series I highly recommend. Next I locked myself up in the studio and read.

There is a tremendous amount of material out there covering balanced equipment. Unfortunately, my studio is unbalanced, as are many other project studios. To these "other" studios, workable solutions are very difficult to come by. So, between the texts, talking with other studio owners, and consulting with friends who are well respected in the audio field, I arrived at what I now feel to be a quiet unbalanced room.

Most engineering professionals would probably argue with that last statement. For many in the pro audio world a "quiet



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unbalanced" studio is an oxymoron. But, once again, philosophy comes into play here. Or maybe it's a financial position. Okay, how about a philosophically-oriented, financially-motivated juxtaposed concept? Anyway, for most real world applications, I know a quiet unbalanced studio can exist so I began rebuilding at the bottom.

### FIRMLY ON THE GROUND

An ideal ground would have the capacity to source and sink infinite amounts of energy within any resistance. The ground should reach to all parts of a facility and to the equipment which requires the ground. This is, of course, an *ideal* ground. My grounding method involves what is called "brute grounding." I designed my facility with what some may consider overkill in the grounding department.

Installing the 3/0 copper cable was a little bit of a challenge. It is a fairly thick (1/2-inch) copper strand cable. I actually ran two lengths of this, about 25 feet each, off of the same eight-foot ground rod. Inside the studio, the ground wire is mounted on the walls behind all the rack-mounted equipment. I then attached about 50 eight-gauge copper wires to the 3/0 ground with micro pipe clamps. My thinking was that I wanted everything to be *very* accessible, with all cable runs as short as possible. Again, I knew using a wire this thick for my ground was overkill, but there were two reasons why I did this:

— Unbalanced equipment is very prone to noise. More than that, it is going to *make* noise. The best you can do is to keep it to what you feel is an acceptable level.

— Troubleshooting. Whenever any noise does pop up now, I can eliminate my ground as a possible suspect. To be that sure of something in a smaller studio where you are in charge of everything is a great comfort.

Once I had an adequate ground installed, I then turned to the power.

### ELECTRICAL SYSTEM

Here I must stress the importance of consulting with someone who knows what he or she is doing — preferably a licensed electrician. The cost for a consultation will be more than made up for in the safe operation of your studio. Fried samplers generally produce less than desirable results. Fried engineers are totally unacceptable.

The power scenario in my studio is as follows: The entire room is run off a single 30 amp fuse; the electricity terminates in several duplex outlets around the room (all two-conductor outlets with no ground); the total draw of my equipment is about 2400 watts, excluding a laser printer and a microwave oven (for the coffee).

Once it was determined that I had an adequate amount of electricity coming into the room, the next step was deciding on how to distribute it. It was unfortunate that all the power to the studio came off one circuit, having an isolated line to work with comes in handy when working with audio noise. On the other hand, having the entire room fed from one circuit eliminates the possibility of additional loops being formed because all of the electricity in the studio is now on the same phase power line.


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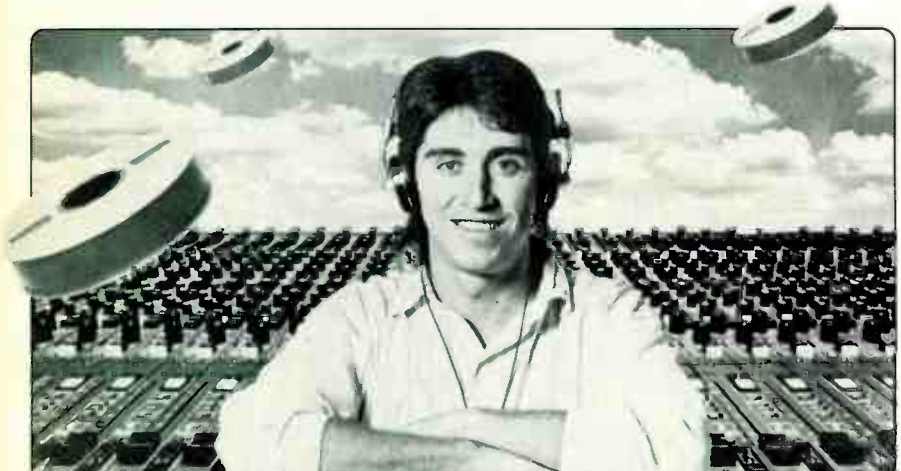

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### GETTING WIRED

I decided that it would be more cost-effective in my situation to attempt to isolate the electricity myself. I used two Tripp-Lite line conditioners with four isolated duplex banks. Each bank covers a certain section of the room. This way, if there is any noise problem, I can isolate it quickly. Since the power coming into the room had no ground, I tied the line conditioners into the 3/0 ground wire and used that as my electrical ground. Of course, my electrician assured me that this was safe. I grouped "like" kinds of equipment together when deciding what to plug into which isolated bank as follows:

—Video-related gear in a bank of their own. (This included the Mac.)

—Signal processing equipment.

—Sound modules and keyboards.

By doing this, several problems have been eliminated. My computer no longer produces that nasty little high-pitched video whine through my consoles. My reverbs have less noise to process now. Strange intermittent noises in the system have all but been eliminated. What it comes down to is this: one more set of variables has been defined. I know what the system will sound like when I power it up.

### GROUND LOOPS

A ground loop is, simply put, a conductive loop that is formed when the earth or grounded conductive elements become part of the circuit. Everyone I spoke to on this topic had their own views on how to handle it. My answer was covered earlier in the section on the grounding system. My reasoning is this: in an unbalanced environment, using some, most or all *semi pro* equipment, you are going to have loops. Add several patch bays providing complete interconnection and it's a fact of life. My solution was to provide a path to the ground so solid and oversized that rather than forming an audible loop, any stray noise would choose the path of least resistance — the 3/0 ground.

### TAKING THE RIGHT ROUTES

One of the problems I ran into before the studio was overhauled was wire. *All* the wire. Audio met MIDI which then crossed over to the power and video lines. It was not a pretty sight. It wasn't planned that way, it just evolved. Getting any piece of equipment out of its rack quickly and simply could not hap-

*continued on page 78*



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# GIG COUNTDOWN

*continued from page 64*

maps with the name of the club, a contact person, phone number, and address. A late band member can be a disaster; be at the gig at least one hour ahead of time to prepare. AAA membership can be invaluable for the map and road services they provide. Don't drive around and hope to find some place — stop and get directions the second there's any confusion.

**T-MINUS 2: STAGE SETUP**

• Don't experiment with positioning! Measure off the ideal distances (for both large stage and small stage setups) between different band members' equipment for ideal audio and visual contact.

• Amplifier power should be equal. All too often there is one power-czar that just has to have enough volume coming out of his or her rig to fill the whole arena. One approach is to have enough power to fill the stage and let the PA do the rest of the work. The other approach is for each performer to have a PA system that can fill the entire audience. The first approach is more realistic and far less costly.

• The sound engineer should have a standard, familiar cabling and configuration setup. Hand out several copies of this configuration to the stage crew so they can work in tandem with the engineer.

**T-MINUS 1: THE SOUND**

• A good engineer knows what the arena will sound like before ever turning the power on. This assessment is based on the type and quality of the gear, and on positioning, the arena's architecture, and speaker placement. Try to use a consistent setup so you can develop an intimate knowledge of your gear.

• Don't use one piece of gear to compensate for a problem elsewhere in the audio chain. For example, don't boost certain frequencies with an equalizer when the real problem lies in an improper crossover frequency or poor mic selection. Another example is under- or overdriving the mixer's input stage by improper input attenuation, then trying to compensate with the channel fader.

• Avoid feedback at all costs. Feedback desensitizes the ear to musical subtleties. It can take a whole evening (or lifetime) to recover from a deafening howl. Decibels are a serious business that can have such serious consequences as tinnitus, or temporary or permanent deafness. For expert advice on this subject, contact the House Ear Institute at 213-483-9930, or your nearest hearing specialist.

• All musicians should be able to hear themselves on stage since music requires a constant interaction between the fingers and ears. Proper monitor and amp placement is the key. Slightly elevating floor monitors can eliminate floor resonance, help direct the sound to the ear, and minimize feedback.

It can take a whole evening (or lifetime) to recover from a deafening howl.

• Turn down rather than turn up. If someone can't be heard, first turn down the elements that are too loud. This also applies for equalization — cut, rather than boost, to solve response problems.

• All band members must be able to see each other and the sound engineer. Eye contact plays a most important role in starting, stopping, soloing, speed, and inflections. Music may end up being aural, but there should always be a visual conductor.

• Always have a sound check. Regardless of sleet, hail, rain, snow, or drunken stupor, the group (and engineer) should know the venue before you start playing. Always have a test flight, or don't test the parachute on the first jump!

**BLASTOFF!**

As someone who's had his share of good and bad gigs, I hope these tips help you along. As to making sure you get paid...well, that's a whole other subject!

*Mr. Christy is a guitarist, film scorer, and instructor. He does a lot of club gigs in Southern California with some of the musicians from Oingo Boingo, and has had every possible live gig disaster and triumph happen at least once. When he's off the road, he scores films.*

# UNBALANCED

*continued from page 76*

pen. Troubleshooting was nearly impossible. One of the most effective ways to prevent this from happening to you is to plan ahead. What I did was as follows:

I have a "U" shaped area where I work. I installed two-inch Electrical Metal Tubing (EMT) through the surface where my consoles, keyboards, and racks sit. Although EMT provides almost no shielding from magnetic fields, it does provide fairly good shielding from electrical fields. It also ensures that the wires will cross each others' paths at 90 degree angles. The tubing for the MIDI, for example, passes through the audio and power raceways. Since all of my wires carrying a different type of signal now pass each other at perfect right angles, signal interference is kept to a bare minimum. All of the raceways themselves are mounted to the walls and separated from each other by about 18 inches. I would have preferred more space between them but, given the room I had to work with, I felt that this was an acceptable compromise.

**REASSEMBLING**

At this point, I felt that I had a good framework and that I could get all my equipment off the floor and back into the racks. Working backwards from the power amp, I installed a single piece of equipment at a time, listening for any noise that should not be there. With nothing plugged into my boards except the power amp and the speakers, I had a good idea of what the minimum amount of noise to expect was to be. Doing this provided a good reference point for me.

Physically wiring everything back in was made much easier due to the fact that I had all the vertical EMT and the raceways in place. No trying to figure out what wires should go where. During the reassembly I kept notes on which gear gave me any problems as far as noise was concerned. Some of my synths and samplers are just inherently a little noisier than others. It helps to know what everything in your studio is or is not capable of.

Now that it doesn't look like a construction site any more, Oxford Studio is running much quieter and more efficiently. When the next crisis arises (it always does), tracking it down will be faster, which means fixing it will be faster. And contrary to some popular myths, you *can* have a quiet unbalanced studio. EQ



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# Tooling a "Tone Tweaker"

With today's MIDI studio demanding more and more mixer inputs, compact mixers (a la Mackie) are becoming very popular, both as stand-alone consoles and "expanders" for existing mixers. Many of these smaller mixers, however, have relatively primitive shelving EQ — bass and treble, boost and cut. Where's the all-important midrange control?

Glad you asked. The Tone Tweaker is a single-stage parametric EQ that sweeps over an approximate 200:1 range (switchable between 80 Hz-16 kHz and 40 Hz-8 kHz), with up to ±15 dB boost or cut at the selected frequency. This is a true parametric, not a pseudo-parametric, so it also has a resonance control with bandwidth from 0.2 to 4 octaves. Patch this handy device in between an instrument output or tape track and your mixer, and you'll regain control of the midrange.

## HOW IT WORKS

The Tone Tweaker places a state-variable bandpass filter (made up of IC2 and IC3A) in op amp IC1B's feedback loop. R15 determines whether IC1B will boost or cut the filtered signal, to produce a peak or notch respectively.

Input stage IC1A provides a high input impedance (100k) and inverts the signal's polarity. Since the filter itself causes a second inversion, the output signal's polarity matches that of the input. IC3B is unused, but wired as a unity-gain buffer to prevent it from oscillating or doing other nasty things.

## BUILDING IT

This circuit can run at fairly high gain, so use short leads where possible (especially the leads to the pots and S1), avoid running inputs next to outputs, and run shielded cable to the input and output jacks. For best results, lay out a circuit board or build the circuit on a small piece of perf board. (If you're not familiar with electronic construction techniques, check out my book *Electronic Projects for Musicians*, published by AMSCO.)

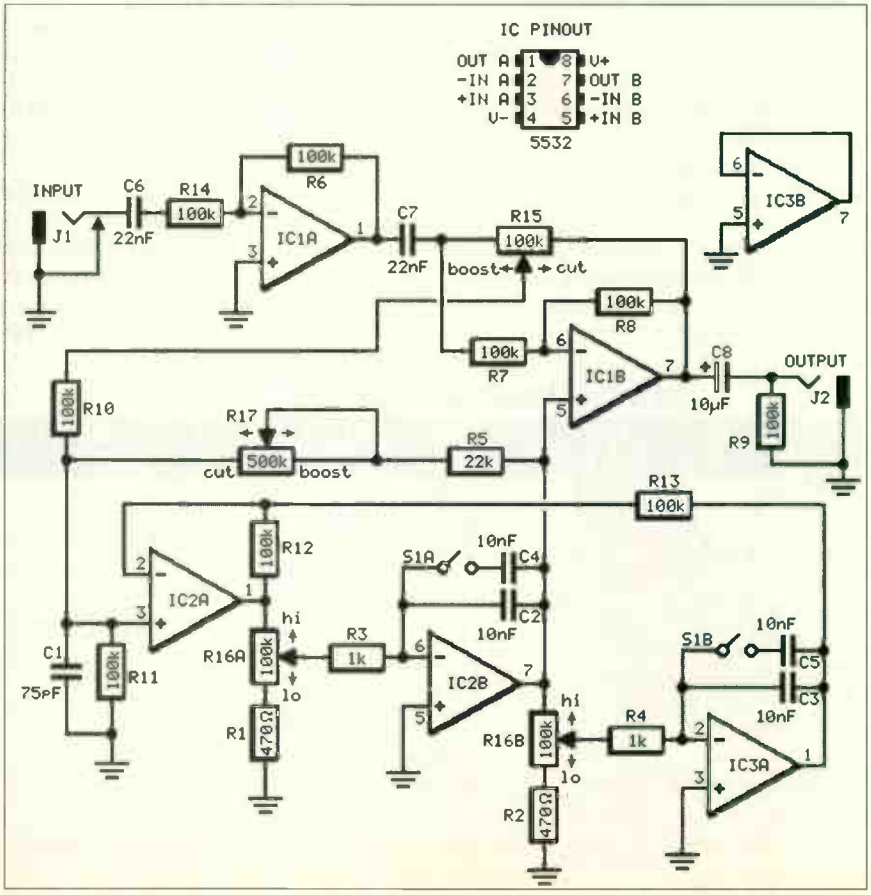
With S1 open, the Tone Tweaker covers around 80 Hz to 16 kHz. Closing S1, which parallels C4 and C5 with C2 and C3 respectively, drops the range an octave. These capacitors should be matched, or at least low-tolerance, precision parts.

To simplify the schematic, IC power connections are not shown. However, each op amp requires +15V at pin 8 and -15V at pin 4. Any ±15V power supply capable of delivering ±50 mA will do. Battery operation and lower voltages can also be used, down to about ±6V; however, this decreases the headroom and can result in more noise (and possibly clipping distortion). No matter what kind of power supply you use, add a 100 nF (0.1µF) capacitor from each supply lead to ground at the point where the power supply leads feed the circuit board.

The circuit is small enough that four of them can fit behind a rack panel (in fact, I use three sets of four-stage parametrics in my own studio). A stand-alone unit, however, also does the job.

A single-stage true parametric EQ can add range to your midrange

**BY CRAIG ANDERTON**



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## Parts List

*Radio Shack part numbers are indicated with #.*

**CAPACITORS**
(50 or more working volts, mylar or polystyrene preferred except as noted)

| | |
|---|---|
| C1 | 75 pF ceramic (#272-121, 50 pF, is also acceptable) |
| C2-C5 | Matched 10 nF (0.01µF) metal film or mylar capacitors (#272-1053) |
| C6, C7 | 220nF (0.22µF) ceramic or mylar (#272-1070) |
| C8 | 10µF tantalum or electrolytic (#272-1013) |

**RESISTORS**
(5 percent tolerance, metal film preferred for fixed resistors)

| | |
|---|---|
| R1, R2 | 470Ω (#271-019) |
| R3, R4 | 1k (#271-023) |
| R5 | 22k (#271-038) |
| R6-R14 | 100k (#271-045) |
| R15 | 100k linear pot (#271-092) |
| R16A+B | Dual ganged 100k pot (#271-1732; see text) |
| R17 | 500k linear pot (#271-211, 1 Meg, is acceptable) |

**MECHANICAL PARTS**

| | |
|---|---|
| S1A+B | Double-pole, double-throw (DPDT) switch (#275-663) |
| J1 | Mono, closed circuit 1/4" phone jack (#274-255) |
| J2 | Mono, open circuit 1/4" phone jack (#274-252) |

**OTHER PARTS**

| | |
|---|---|
| IC1-IC3 | NE5532 or TL082 (#276-1715) internally-compensated dual op amp |
| Misc. | IC sockets (#276-1995), perfboard, rack case, wire, knobs, power supply, etc. |

### USING THE TONE TWEAKER

Use the Tone Tweaker as you would any midrange equalizer. To avoid "plastic-sounding" EQ, don't boost too much — try to fix the problem at the source itself. Lots of resonance and boosting can lead to distortion; the maximum input signal level for any frequency under these conditions is about 2V peak-to-peak. With minimum resonance and no boost, you can feed in at least 20V peak-to-peak.

Remember, too, that cutting is as powerful a tool as boosting, if not more so. If you need to boost the treble and bass, try cutting the midrange instead. This will reduce the risk of distortion and often give a "sweeter" sound.

You can also put two or more Tone Tweakers in series (i.e., the output of one feeds the input of the next) for a multi-band parametric EQ. For example, one stage could cut the lower midrange, while the other boosts the upper midrange.

### FINDING PARTS

Many parts are available at Radio Shack (see parts list); you can substitute the slightly noisier TL082 for the 5532 if the latter is unavailable.

The hardest part to find is R16, the dual ganged pot. Ideally, you would want it to have a reverse audio taper, but such pots — especially dual pots — are rare. Instead, you can either use a dual linear pot and deal with the fact that the lower frequencies cover most of the pot's travel, or use an audio taper pot and wire it in reverse. This gives the right taper, but turning the control clockwise lowers the filter frequency, which is the opposite of what you'd expect.

Finally, Paia Electronics (3200 Teakwood Lane, Edmond, OK 73013; tel. 405-340-6300) offers a kit of parts for a four-stage parametric EQ. Although not exactly the same design as this one (the Paia version uses quad op amps to save space, eliminates the input buffer, and does not include a range switch), you'll get pretty much the same results without having to chase down parts. Paia also makes a ±15V power supply suitable for powering the Tone Tweaker, as well as many of the other projects covered in this column.

So what are you waiting for? Plug a Tone Tweaker into your budget mixer and give some snap to a synth, make a vocal more intelligible, or eliminate the annoying "honk" from a low-budget piano sample — and that's just the beginning.

*Craig Anderton, EQ's west coast editor, is the author of eleven books including* MIDI for Musicians *and has worked on 10 recordings. His latest,* Forward Motion *(distributed by MCA), was done with new age keyboardist Spencer Brewer.*


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# Figure 8

## Tascam's new 8mm digital audio products get the industry's attention

**BY J.D. SHARP**

THE TASCAM division of Teac is the leading producer of recording equipment in the world, so it is not surprising to find it bringing a cost-effective digital multitrack tape recorder to market. Of course, the main competition is the Alesis ADAT, but Tascam already has more to contend with: at the recent AES show Alesis announced an agreement with Fostex, which should result in a Fostex-produced digital recorder that conforms to the ADAT format. This doesn't seem to have intimidated Tascam, however; it has its own clear concept of how this type of recorder should be built, and has pursued this vision in the form of the new DA-88 (list price: $4499).

The Tascam unit is due to hit the streets sometime in early 1993, at which time this magazine and others will undoubtedly put it through its paces. Before that happens, it still pays to look at how Tascam has taken the Alesis challenge and at how it expects the project recording marketplace to do its digital recording in the years ahead.

First off, the DA-88 does its recording on 8mm Hi8 videotape. Hi8 is the highest grade of 8mm video tape, and was chosen, according to Tascam, because of the extremely high density of the metal-particle medium, which allows long recording times with low dropout and error rates. In fact, the DA-88 is capable of recording up to 100 minutes on a 120-minute tape. Another consideration for Tascam engineers was tracking; the Hi8 format embeds its control track within each helical scan of the head, rather than as a separate longitudinal track. According to Tascam, this is how they achieve perfect tracking and interchangeability between machines (see "S-VHS vs. 8mm" story in this issue).

A front panel switch is provided for switching between 44.1 and 48 kHz sampling rates, with variable pitch of ±6% available at either rate. Since most of the time the DA-88 will be used for creation of multitrack recordings that are then mixed down through analog mixers, the 48 kHz rate is likely to get the most use (because of better frequency response). At some point, all-digital mixers may become available, in which case it could be cleaner to use 44.1 so that a sample rate conversion can be avoided when mastering to CD.

### TOUGH TRANSPORTS

Tascam makes a point of talking about the ruggedness of its 8mm transport. The company does have quite a bit of experience in the production of this transport format, since it makes an 8mm unit that's the heart of the "black box" flight recorders in many commercial aircraft, and other specialized units for NASA (including the space shuttles). You can't get much tougher than that! While the particular transport in this unit is *not* the one found in the black boxes, at least the knowledge gained in production of rugged compact transports has been applied to the DA-88. The entire transport is built by Tascam at its factories. Tapes may be preformatted, or can be formatted on the fly — a real convenience when you're dealing with 100 minutes of recording time.

The front panel will seem instantly familiar to anyone who has operated a Tascam recorder of recent vintage. Two memories hold location points that can be used for Rehearse, Repeat, and Auto Punch In and Punch Out. The large display shows absolute time in hours, minutes, seconds, and frames, and also shows memory locations, pitch change amount, SMPTE timecode, and SMPTE offset (the SMPTE

The heart of Tascam's digital audio system — the DA-88 8-track digital recorder.



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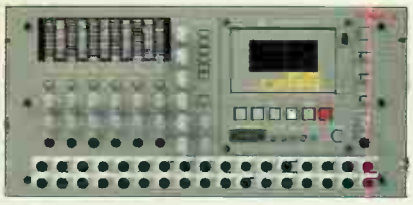
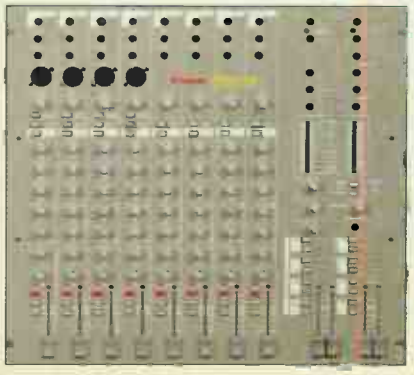


Frequency Response:
20Hz-18kHz, ± 3dB
THD: 0.5% (1kHz nominal level)
S/N Ratio: 95dB

### RMC-88



Input: TAPE 1-8,
LINE 1-8, MIC 1-4,
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MASTER L/R,
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features apply to the optional synchronizer). A shuttle wheel simplifies location of a particular spot, and operates bidirectionally. A switch below it takes it out of the circuit if desired. Variable speed is set by selecting pitch change on the display and using up/down keys to achieve the desired setting.

Tracks can be placed into record in several different ways. The main Record transport control can be used to place tracks that have been individually armed into record in a single-button operation. The Auto Record function will similarly drop preselected tracks into and out of record using the two memory points. Or you can simply roll in Record mode, and use the individual track record selects to place one or more tracks in and out of record — very convenient when replacing several sections at once, like redoing all the background vocal parts in every chorus.

### GETTING CONNECTED

Up to sixteen DA-88 units can be locked together simply by connecting a 15-pin D-sub connector between each unit, without using up any of the available tracks. Digital I/O utilizes a 25-pin D-sub connector that facilitates copying tracks between units in the digital domain. Word Sync I/O is provided on BNC jacks. This will allow Tascam's forthcoming hard-disk-based RA-4000 random access recorder and its time-code-capable DA-60 DAT recorder to lock up to the DA-88 without additional sync gear. It's also a way to lock to and with Digidesign Pro Tools. Two optional digital interfaces have been announced, one in AES format, the other in S/DIF-2. There was some mention of an 8-channel digital interface at the AES show; stay tuned for further developments. Prices for the digital interfaces are "to be announced."

One of the most important applications for any audio recorder these days is synchronization to video sources. Tascam has covered this base nicely with the optional SY-88 synchronization board (list price: $799). It plugs neatly into the rear of the DA-88, and allows the recorder to function as either master or slave. A sub code channel is used for the code, so no tape tracks are used up. There's more to the SY-88 than just SMPTE sync; you'll also find an RS422 port, Video Sync, and MIDI Machine Control capabilities built in. Only one synchronizer board is required, regardless of the number of DA-88's locked together.

Two remote controls are available as options. The basic RC-808 ($175) provides transport and record selects for one machine. The RC-848 ($1499) will directly handle up to six DA-88's; Tascam doesn't think that most end users will have need for more tracks, at least not in this format, so it has optimized the remote for this number. Record selects for all 48 tracks are available at the top of the unit without having to select the unit first. The RC-848 serves as a full-function autolocator for up to six machines, and can set pre- or postroll times when locating. It also is capable of offsetting machines against one another, and handles Repeat Play and Auto Punch functions. The final available option is a 24-track remote meter bridge, the MU-8824 ($899).

Of course, the bottom line on any recorder is the sound; the jury will have to remain out on this one until production units ship, which Tascam expects will be in the first quarter, with some of the options following along a bit later. But as this preview indicates, there's no question that the engineers at Tascam have worked long hours to come up with an affordable digital 8-track recorder that's competitive with anything on the planet. EQ

Tascam's DA-60 DAT recorder (above) can hook up to their DA-88 without additional sync gear.



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World Radio History

# OH NO — Noise!

Photo by Peter Monroe

## Everything you always wanted to know about noise reduction (except for what we'll be publishing next issue)

**BY LEN FELDMAN**

NOISE IS EVERYWHERE. On city streets. In stadiums, classrooms and bars. Even in great recordings. A good definition of "noise," at least as far as audio sound reproduction is concerned, is any reproduced sounds that are not part of the original sounds picked up by microphones during the recording session. Generally, even though harmonic and other forms of distortion such as IM fit that definition, we usually exclude such coherent signal components from our definition of noise and confine the definition to random noise. Clearly, an objective of any recording is to have as little noise as possible.

What seems like a very long time ago (in the dark ages of tape recording), when tape hiss was the enemy of both recording engineers and consumers who made their own tapes, a brilliant engineer by the name of Ray Dolby came up with the first double-ended noise reduction system. By double-ended, we mean that the system (dubbed Dolby A) involved a dynamic form of EQ encoding at the recording end of the chain, and a reciprocal or opposite kind of decoding during playback of the finished tape. Dynamic EQ means that certain frequencies were boosted during recording by an amount dependent upon their amplitude. Since tape "hiss" consists of upper middle and high frequencies, it was those frequencies that were boosted during recording, effectively getting those frequencies up and further away from the generated noise floor. When mid- and high-frequency amplitudes were low (closer to the noise floor), the Dolby system boosted them more than when they were loud. Thanks to the psychoacoustic masking effect, when you hear loud sounds they tend to mask low-level noise and hiss. When mid- and high-frequency sounds are soft, however, the tape hiss comes through loud and clear, so those signals have to be boosted much more.

The playback process in a double-ended noise reduction system such as Dolby A involves cutting or attenuating those mid- and high-frequencies by exactly the same amount that they were boosted during recording. The attenuation not only restores "flat" response to the reproduced music, but cuts down the residual tape hiss and noise generated during the recording process by the same amount. Prior to the invention of Dolby noise reduction, single-ended noise reduction systems such as high-cut (low-pass) filters were also able to reduce tape hiss, but they did so at the expense of fidelity. In a single-ended noise reduction system, if you knock down treble frequencies by 10 dB or so to reduce noise, you're also going to knock down the high-frequency musical content in the programming. To be sure, some single-ended systems, such as one developed by high-fidelity pioneer Herman H. Scott early on, worked dynamically, too. His system sensed the loudness of high frequencies. If they were very loud, no attenuation took place, but if they were softer, they were cut in much the way that a treble control cuts down highs.

### DOLBY FOR THE MASSES

In the early 1960s, after the cassette tape format was introduced by Philips as a "strictly business dictation" format, Ray Dolby applied his ideas to reducing noise in the then "low-fi" cassette medium. He simplified his professional Dolby A noise reduction (NR) system to make it easier to use in consumer products and began licensing the system to manufacturers of consumer cassette decks. To differentiate the consumer version from the pro system, he called the new system Dolby B, by which designation it goes even today. Many audio authorities believe (and I completely agree) that were it not for the introduction of Dolby B to cassette decks, that format would never have achieved the popularity that it did — especially among high-fidelity stereo enthusiasts. Early cassette tapes exhibited signal-to-noise ratios no better than around 45 dB, with some better early grades approaching the 50 dB mark. Anyone who has listened to a tape having no more than 45 dB of signal-to-noise ratio will readily agree that the tape hiss is intolerable and detracts from enjoyment of the program material. Dolby B improved the signal-to-noise ratio of cassettes by approximately 10 dB, turning tapes that inherently had signal-to-noise ratios of 45 dB into tapes capable of 55 dB signal-to-noise. In terms of noise power, that's a reduction of noise by a factor of ten-to-one. In terms of audibility, the residual tape hiss was cut in half!

Many years after the invention of Dolby B, Dolby Laboratories decided that it was time for further improvement in the consumer noise-reduction system. That's when they came up with Dolby C, a system that improved signal-to-noise ratios by a total of nearly 20 dB. Figure 1 shows the residual noise level (referred to as maximum recording level) of a high-quality cassette, plotted against frequency. The upper curve was taken with no Dolby noise reduction applied. The next



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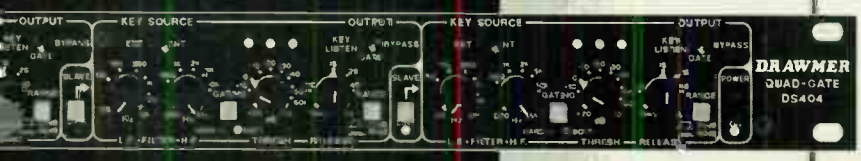


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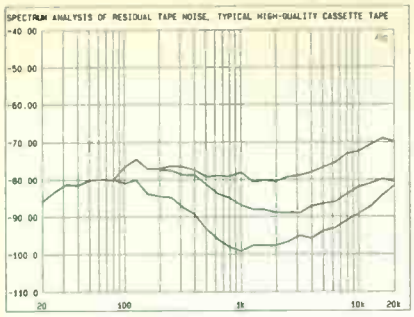


**Figure 1**

lower curve shows how Dolby B lowers the mid- and high-frequency noise content, while the lowest curve shows the additional improvement in signal-to-noise at those frequencies when Dolby C is used. Notice that Dolby C improves the signal-to-noise level down to somewhat lower frequencies than Dolby B. One of the advantages of Dolby B (despite the fact that it is not as effective as Dolby C) is the fact that you can play a Dolby B-encoded cassette tape on an inexpensive cassette deck that's not equipped with any Dolby NR and it will still sound reasonably well-balanced, response-wise. Try that with a Dolby C-encoded cassette, and you sense that something's not quite right. Highs seem entirely too bright. That's probably why most commercially available music cassettes use Dolby B, even though it's not as effective as Dolby C.

Anyone who has tried to transcribe a well-recorded digital CD onto audio cassette tape knows only too well that the task is not easy — and rarely very successful. To be sure, makers of audio cassette tape have tried their best to come up with magnetizable particles that are smaller, and that can therefore be more densely packed for higher recording levels and correspondingly greater dynamic range capability. Despite these efforts, the dynamic range available on even the best grades of normal and even high-bias tapes falls short of what's required to record program material from most CDs.

In an effort to solve the problem, Dolby Laboratories once again turned its attention to analog recording technology. What it has come up with has been dubbed Dolby S-type. With CDs now dominating the audio software scene, the need for greater dynamic range in a tape recording system becomes apparent. Equally apparent is the need for a recording system that suppresses tape noise even further than either Dolby B or Dolby C noise-reduction systems have been able to do.

Dolby S-type has been developed not only to provide superior sound rivaling that of digital recordings, but also to ensure that consumers will be able to easily and consistently enjoy the superior sound of the new program sources when those sources are transferred to cassette tape. To achieve this goal, a new signal-processing system that dramatically increases available dynamic range while maintaining excellent signal stability has been combined with a set of performance standards encompassing the entire group of specifications for tape equipment.

The heart of the Dolby S-type is its new signal processing circuit, derived almost directly from the professional Dolby Spectral Recording, or SR system, that was introduced to the professional recording and film industry. Dolby SR increases dynamic range by up to 24 dB at high frequencies and 10 dB at low frequencies.

I'll tell you more about Dolby SR and Dolby S next time, and will also talk about other noise reduction systems such as dbx. Until then, let's keep the noise down, OK? EQ


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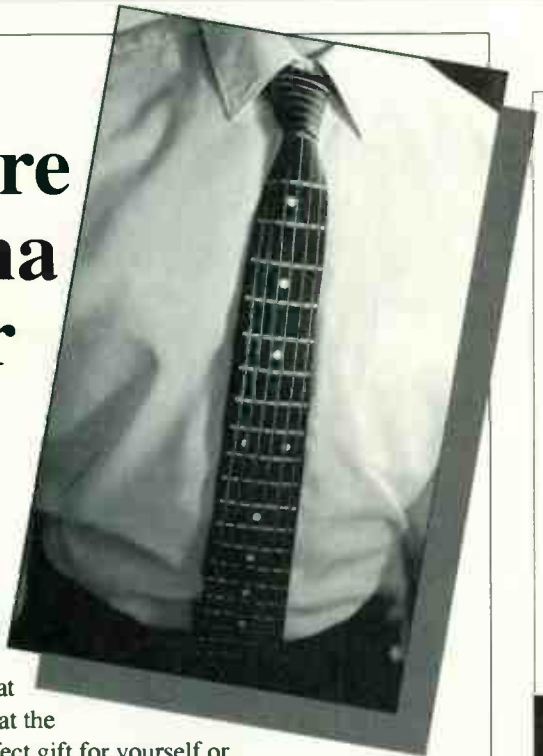

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# Membership Has Its Privileges

## More than just a convention organizer, the AES is a full-service association

**BY MARTIN POLON**

QUESTIONS FREQUENTLY ASKED at educational functions, professional meetings, conventions and other audio industry gatherings are: "How do I obtain and hold the respect of my fellow audio practitioners?"; "How do I stay informed on the latest developments in the audio and recording industry?"; and "Where can I go to 'network' with like-minded individuals interested in personal and project studios or other audio topics?" The answer to all of these questions, and a major source of personal and professional enrichment to those who already belong, is membership in the Audio Engineering Society (AES).

There is no other mark of respect that is so widely acknowledged amongst audio professionals as membership in the AES. It informs all who are interested that you have met the Society's criteria for acceptance as an audio "engineer" at the level appropriate to your current skills. Whether you are a student, associate, regular member, fellow, or life member, your affiliation confirms your dedication to the art and science of sound recording.

### TESTIMONIALS

If all of this sounds just a bit exaggerated, consider the following: "I had entered the Army to avoid dealing with my future. I was bored with school, and the military seemed the one way to put off decision making and to continue 'party time.' But once in, I discovered that my MOS (Military Occupational Specialization) was in the kitchen — feeding thousands of troops each day. I knew that I wanted to do something in audio rather than make thousands of donuts, so I approached the Armed Forces Radio (AFR) chief at our base. He was sympathetic to my plight but insisted on some proof of my supposed audio proficiency. I had joined the AES in college and I whipped out my AES card. He pulled his wallet and matched my card with his and a smile! Within a week I was forever relieved of the kitchen mess and well on my way to an audio career. Today, I own and manage a major recording studio and I could say I owe it all to the AES."

One hears from job seekers who report over and over again that the presence of an AES membership on their applications validated their professional resumes. Yet there is no secret handshake amongst AES members to justify this respect. What is acknowledged is a matrix of nearly 500 local section meetings in the United States and elsewhere each year. The local meetings offer a forum for the discussion of specific topics of audio interest involving audio technology, audio operations, or audio trends. They provide local access to the latest developments in recording, broadcasting, sound reinforcement, consumer electronics, maintenance, acoustics, signal processing, and a thousand and one other topics. What makes this program so attractive is that the individuals who invented and/or pioneered a specific development will frequently be the ones to address the local section meetings. The studio facility that has had the first breakthrough installation of an exciting new technology will host AES sections for a discussion and tour.

### GET-TOGETHERS

AES conventions represent the yearly meeting of what is virtually the entire world audio community. Hundreds of audio- and recording-equipment makers exhibit their wares. Over one hundred technical papers describing new developments are presented each year, and a dozen or more workshops are offered on topics that range from career options for women in audio to the latest techniques in digital audio editing on workstations. Attendance frequently exceeds 15,000 individuals. In addition, it is the venue chosen for the simultaneous gathering of the Society of Professional Audio Recording Services (SPARS); for seminars of the National Academy of Recording Arts and Sciences (NARAS); and as the annual meeting place of both audio educators and music industry educators. Numerous meetings are held by the various AES committees entrusted to develop and establish standards for the audio industry in such areas as digital audio interconnection, sampling rates, music sound levels, etc.

The AES publishes a journal that presents the best of the technical papers submitted at the conventions or directly for publication. In addition, convention activities are both previewed prior to the gathering and reported on in depth afterwards. So AES members who cannot attend the annual meeting in the U.S. or the similar yearly European conclave receive a full report within the journal. Section-meeting summaries expose the reader to all the new and interesting concepts that were introduced in the U.S. and around the world. Industry and AES news highlights, information on standards activities, and updates on a host of other topics assist the member in keeping "track" of the audio business.

There is much that the AES offers, but perhaps the most important value for many members is the pleasure of personal contact with the hundreds and thousands of other audio practitioners who attend the local meetings and yearly conventions. A bonus to be sure, but an important one at that!

*For more information about the AES and its activities, contact the Audio Engineering Society, 60 East 42nd St., Room 2520, New York, NY 10165; tel: 212-661-8528; fax: 212-682-0477. Tell them* EQ *sent you.*



World Radio History

# Making the Most of Your Mics

Yes, you need to maintain your mics to get the max from your mouthpiece

**BY DR. RICHIE MOORE, PH.D.**

LOOK AT THAT FUNNY-looking thing over there gathering dust in a box. I used to remember what that was, 'er, did. Oh yeah, that's an MD, um, a KM, oh wait...an SM-50 something. What the hell — it's a *microphone*. Out of sight, out of mind. That is the way it is with a lot of old tried-and-true equipment.

Currently, the most common sight in studios are direct boxes. Everything is sampled and synthesized into digital storage. Drums, keys, guitars, and many other tones are all put on tape or hard drives through direct boxes. This is all well and good, but how do those samples get into these wonderful devices? You got it — microphones. Oh yeah, and until DFVC (direct from vocal cord) systems are available, artists will still have to use microphones to put their vocals on their storage medium of choice.

Illustration by Milton Reyman

### OF MICS AND MEN

Microphones are the recording engineer's and artist's palette of sound color. With the proper mic in the proper place, you can get all the tone you need without much tone processing. Every mic ever made has a distinctive color of its own. The trick is to match the desired tonal effect with the proper transducer (mic). You have to cater to the whims and personalities of mics to get consistent results. The secret of being able to get these sounds at will lies in the care given the microphones.

Mics are basically an electromechanical transducer. A transducer converts one form of energy into another. Acoustic sound pressure arrives at the capsule (diaphragm) and changes the air pressure into voltage. Mics come in all varieties, but can essentially be categorized as dynamic, condenser, ribbon, small diaphragm, or large diaphragm types. Pretty simple in theory, but many other things affect the operation of a mic.

Mics of all types are subject to changes in barometric pressure and humidity. I have found that when barometric pressure is high, a microphone is not as sensitive to sound-pressure variants. When humidity is high, the tone becomes darker (fewer highs). These are just a few of the reasons why no matter how much care you take in writing down or storing the console settings, the mic always sounds different the next time you use it.

### CARE PACKAGE

As I said before, mics require some care to maintain their quality and be reliable. The first thing to remember is that a mic is a fragile item. The capsule is made of very delicate material and the electronics are also delicate. I know that people swear that you can hammer a nail with an old Electro-Voice EV-666, and I can personally attest to that, but the longevity of the mic will be severely diminished if you do so. You have to be gentle in the midst of the audio hurricane.

Microphones should be stored in their original cases whenever possible. This protects them from dust, dirt, moisture, and impact. It also allows an easy inventory assessment at the end of a session. In lieu of the original cases, a sealable flight case with foam cutouts shaped to each separate mic will do.

Moisture is a mic killer. Humidity and moisture can erode the capsule and make a mic unusable. Storing mics in a sealed case is therefore very important, especially with condenser (electret or phantom powered) mics. These capsules are very sensitive to moisture. Store condenser mics in a zipper storage bag with a packet of silica gel inside to absorb moisture. You know what the silica gel packet looks like; you get one with practically every piece of electronic gear you buy. If you must leave a mic up overnight, put a baggie over it with the silica gel pack inside, and seal it with a rubber band.

The electronics inside a mic don't need any special care beyond the exercise of normal common sense. Don't throw a mic in a wash basin filled with water while the mic is attached to the console and phantom power source — that sort of thing. The connectors can use some care. Modern FET (field-effect transistor) mics use phantom power usually supplied by the console at +48 volts DC through a 3-pin XLR-type connector. Valve (tube) mics usually have a dedicated power supply with five or more contacts through which the audio signal and the tube voltage are carried. The connectors get dirty and corrode with time. A little Cramolin® on a Q-tip applied to the connectors every six months can help prevent signal loss from corrosion. You might also do the same for the mic cables that you use with the

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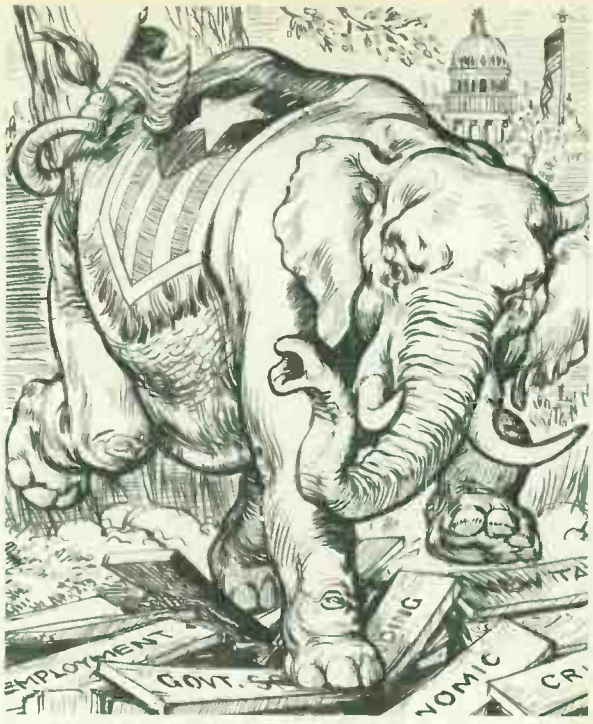


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You see it every day. The quarterback lofts the ball over the wide receiver's head.

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In the audio environment, it's the same problem, times ten. The machines you use, most often don't speak, read, or respond to the same language. You can't just line them up, push the "go" button and have them all operate in unison. How, then, do you get the various formats of audio and video tapes to work in sync?

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microphone.

While you are cleaning the connectors, you are in a perfect position to check the connectors for loose screws. The constant plugging and unplugging of connectors will loosen the best of them. There is nothing so frustrating as trying to disconnect a mic from a cable and yanking out the internal wiring — and mics don't have very long wire service loops with which to attempt easy repair. Inspect the mic carefully and use a jeweler's or flat-head screwdriver to tighten the connector.

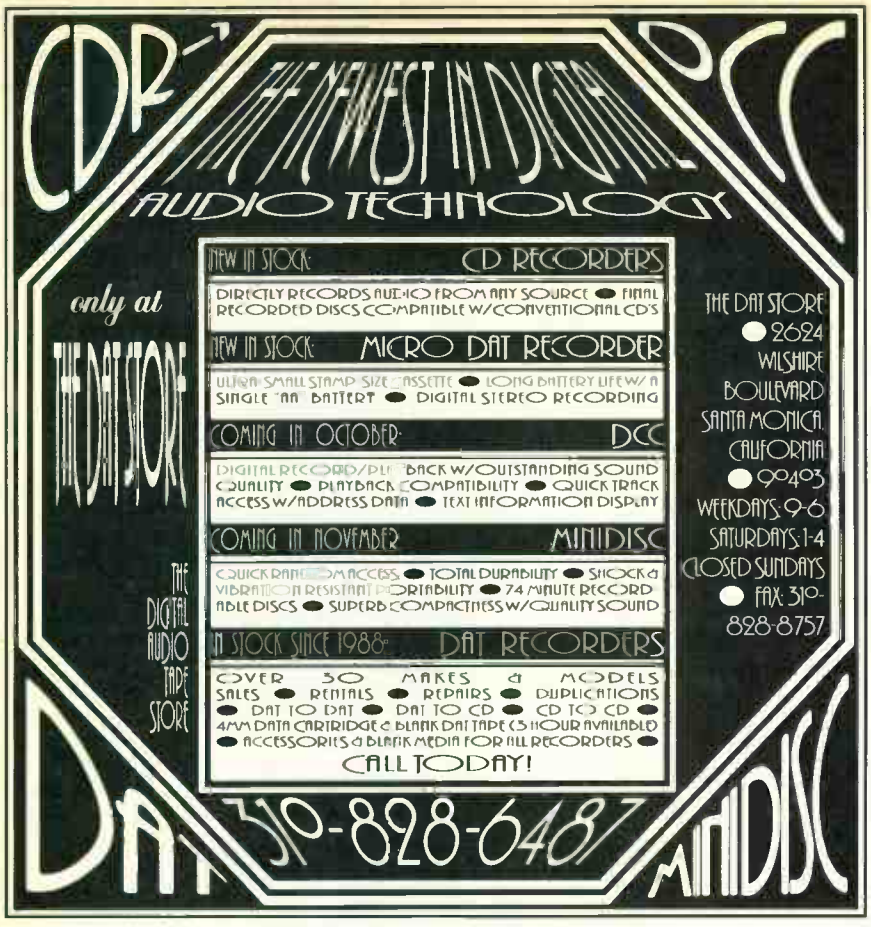
Always check the cable connectors as well as the internal ones. When an XLR connector starts getting wide around the rubber insertion holes, replace the connector; a loose one can cause all sorts of problems, and connectors are cheap. I personally prefer Neutrik NC3FXB and NC3MXB gold-plated connectors when replacing damaged XLRs. Many microphone problems are directly attributable to poor connections.

Most microphones can and should be repaired by the original equipment manufacturers. They really contain few user-serviceable parts, or even many parts that can be replaced by a seasoned studio field tech. In the case of vintage tube microphones, Stephen Paul in Los Angeles and Klaus Heyne of German Masterworks near Portland, Oregon, are your best bets. Klaus has worked on all the microphones I use, and I swear by him. Stephen Paul is no slouch either, and provides quality craftsmanship, but Klaus used to live in the San Francisco Bay Area very near me. But be prepared — an excellent craftsman's work doesn't come cheap.

One final note of microphone maintenance: keep the mic stands and mic clips in a decent state of repair. When a $10 clip goes bad, it can damage a $500 microphone. Duct-tape, on a mic stand, is no substitute for tight fittings. Parts are available to replace worn ones, and, once again, an ounce of prevention... Regular cleaning and tightening of your clips and stands will serve you well.

All these maintenance items will help you get the best out of your mics for years to come, and protect a major investment.

*continued on page 109*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# Zoom 9030 Effects Processor

EQ LAB REPORT

**MANUFACTURER:** Zoom, 385 Oyster Point Blvd. #7, South San Francisco, CA 94080. Tel: 415-873-5885.

**APPLICATION:** Processes and adds special effects to guitar, bass, voice, keyboards, and other signal sources.

**SUMMARY:** Compact, cute, and easy-to-use, the 9030 gives good sound with a useful complement of editable parameters.

**STRENGTHS:** Good visual feedback, four knobs for simultaneous parameter control, small size, clean sound quality.

**WEAKNESSES:** Doesn't respond to pressure or pitch bend messages; small knobs and wide parameter ranges require finesse when setting parameters; order of effects is fixed.

**PRICE:** $749 (matching 8050 footswitch, $249) **EQ FREE LIT. #:** 118

ZOOM HAS ZOOMED on the scene as a maker of nifty, cost-effective guitar effects boxes (although they're also suitable for bass, mics, electronic drums, etc.). The first thing you notice about this half-rack device is a very high "cute factor"— striking blue 40-character fluorescent display, gray mottled case, small LEDs to show which effects are selected — but dig beneath the hip packaging, and you'll find that there's more involved than good looks.

## FACTS & SPECS

The 9030 includes 47 individual effects; up to seven can be combined in up to 99 user-programmable patches. Like most manufacturers, Zoom's definition of an "individual effect" is somewhat liberal— for example, compression and limiting count as separate effects, as do chorus, flange, phasing, etc. Basically, you have nine groups of effects, arranged serially in the following order (the number of choices for each group is given in parentheses): compression (2 types), effects loop (for inserting that favorite vintage effect you can't live without), analog distortion (3 types), EQ (3 types), amp simulator (2, guitar and bass), misc. effects 1 (12 time-based effects including tremolo, octave divider, and wah), misc. effects 2 (12 that include variations on misc. effects 1 but also offer different effects), special effects (7 including advanced time-based effects and some real "out" sounds), and reverb/tapped delay (6 types).

The order of effects is fixed; you can't do some things, such as putting the EQ in front of the distortion. There are, however, four different signal routings (parallel/series, stereo/mono) that are selected automatically, depending upon which effects make up a patch. For example, if the special effects group is off and the amp group is set to stereo, misc. effects 1 and misc. effects 2 are patched in parallel, and followed up by stereo reverb. Although the routings are not particularly flexible, they do give you another set of options.

A matrix of nine legended LEDs show the status of the effects blocks. Red means active (turns to amber when the unit is bypassed) and green means inactive. A two-digit LED shows the patch number, and there are also two input-level blinky lights. It's easy to bypass an individual effect to see how it affects the sound, which is helpful as you start learning how to edit the factory patches (let's see, is that sharpness coming from the amp effect or the special effects...).

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### THE NOISE FACTOR

The EH-50 is very quiet; however, a sound source with background noise, processed by the EH-50, will become an enhanced sound source with enhanced background noise. For best results, try to get the cleanest signal into the EH-50. In extreme cases, an external low-pass filter can be used to roll off high-frequency noise. Placing the filter either before or after the EH-50 can also make a difference. Another suggestion is to use the EH-50 when committing to analog tape, because enhancing recorded material may exaggerate tape hiss.

### GAIN STRUCTURE AND DISCIPLINE

Since the EH-50 has the sensitivity to serve as an instrument preamp, it is very important not to overlook the Level switch located on the rear panel. Paying attention to this feature will ensure not only the optimum signal-to-noise (S/N) ratio but also the correct range of the enhancement control. For example, setting the switch to -10 with a signal that is a nominal +4 will make the Enhance Level control overly sensitive. I suggest experimenting with this switch by leaving it in the +4 setting except when a musical instrument is connected. Unless you find this arrangement yields poor S/N, it might also serve as a sort of discipline to avoid excessive enhancement.

One "problem" is that the EH-50 really does work well with some material. Addictive personalities might feel, therefore, that if a little bit of enhancement works, more enhancement would be even better. In spite of the Enhance Level display and the overload indicators, it is possible to get nasty results. Be sure to use the Enhance switch regularly to compare treated signals with untreated ones.

### CONCLUSION

If the EH-50 were my child, it would be named "Instrument Preamp and Dual-Channel Enhancer." This not only describes the EH-50 more accurately, it also emphasizes the hidden feature: an instrument preamp with an FET front end. I think Boss could sell the EH-50 based on this feature alone, especially in light of the recent proliferation of vacuum-tube preamps. (An FET is the semiconductor equivalent of the vacuum tube and, as such, is the perfect interface between musical instruments and electronics.) By adding the FET to the design, something Boss could easily have left out, the EH-50 is a very acceptable instrument preamplifier, especially for the price. As for EQ and enhancement, the EH-50 definitely increases your options.

*—Eddie Cilletti*

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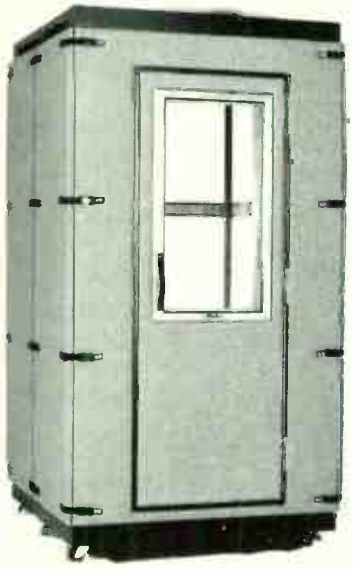

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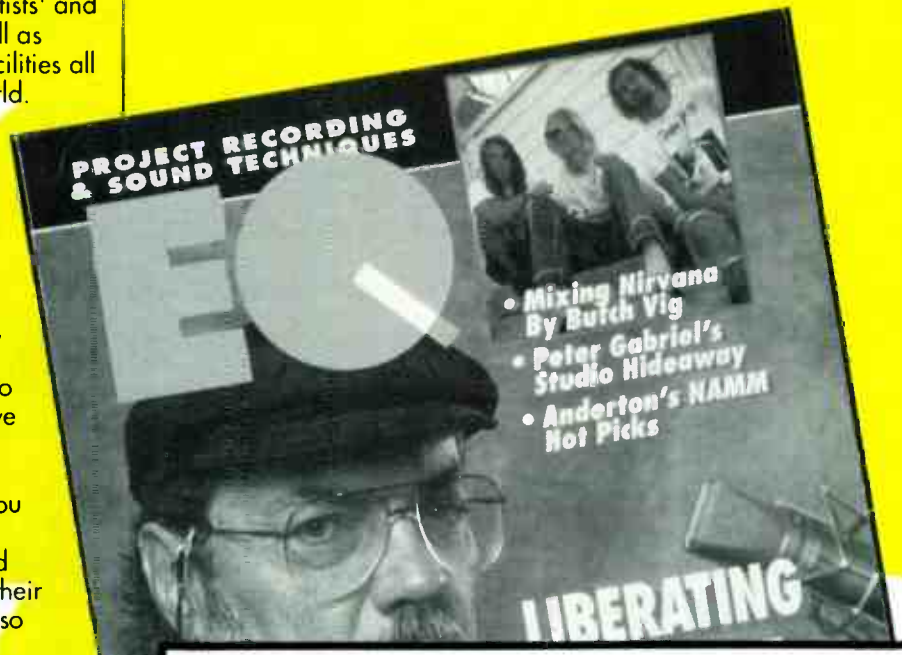


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# Lexicon LXP-15 Effects Processor

EQ LAB REPORT

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

**APPLICATION:** Cost effective digital effects with considerable options for remote control.

**SUMMARY:** An inexpensive delay and reverb unit for practically any application.

**STRENGTHS:** A very capable reverb processor with a wide palette of rooms, plates and delay effects. Front panel controls are fast and easy to use.

**WEAKNESSES:** Fewer parameters for adjustment than many competitive units and the chaining of effects is fixed. Slight click is produced when changing algorithms.

**PRICE:** LXP-15 — $1050, MRC — $399 **EQ FREE LIT. #:** 120

LEXICON HAS DEVELOPED some of the best reverb devices available. It has even developed a sophisticated architectural reverberation system, called LARES, based on its top-of-the-line 480L reverberation hardware, that enhances the acoustics of theaters and concert halls. Taking an interest in the sound of the best concert halls in the world (including Symphony Hall in nearby Boston) has allowed Lexicon to develop algorithms that can be mixed directly with the acoustic reverberation produced in a good concert hall. Lesser reverb units sound distinctly anemic when put to this test.

In 1989, Lexicon began producing the LXP series of effects processors for those who could not afford its 480L, but still wanted that Lexicon sound. The most recent in the series is the LXP-15. This one-rack-unit digital effects processor uses a soft-key approach to couple the lower line of the two-line LCD display with the five buttons directly underneath. The function of each button is labeled to correspond to the function on that page of the LXP menu. Beside these buttons is the View button, which toggles the display between parameter selection and value display modes.

A large Adjust knob is then used to modify parameter values or select a preset program. Beside the Adjust knob is the Page knob, which selects the page of parameters to be adjusted. The menu of parameters is never buried within another menu; instead it is just the twist of a knob away. On the opposite side of the front panel are input and output level controls and a single four-segment LED array indicating input and regeneration levels, from -24 dB to clipping, in both channels.

The rear panel is simply a row of connectors: four phone jacks for the unbalanced stereo input and output; five phone jacks for foot switches or pedals; the usual trio of MIDI jacks; and an IEC-type power connector. The input is summed before processing, so either input can be used for a mono source, knocking the 50k-ohm input impedance in half. The adjustable 600-ohm output is nominally +4 dBu and is specified to deliver up to +14 dB into 10k-ohm inputs.

The multieffect processor concept of the LXP-15 differs from most other units of this type. Instead of stacking effects selected at will from a palette of algorithms, the user is presented with a fixed chain of effect parameters and simply decides on the setting for each one. There are five basic sets of algorithms; Delay/Reverb, Pitch Shifting/Delay, Gating, Plate, and Chorus/Delay.

Unlike the half-rack LXP-1, all of the parameters of the LXP-15 are adjustable from the front panel. The parameters are assigned one at a time to the continuous-control Adjust knob to make changes. I found the process a little tedious when moving quickly from one end to the other, which typically involves 128 steps.

The manual uses clear and concise signal flow diagrams to show how the parameters interact and where each of the mixing/level adjustments is made. The trade-off for less flexibility in the chaining of the effects is made up for in the way parameters are assigned — the LXP-15 always presents the same types of parameters on the same page in every preset. This consistency makes a big difference in learning to quickly modify presets.

The parameters for modifying presets may be less numerous than in other processors, even in the low- and midprice range, but all of the most important ones are included. Creating a reverb that suits an instrument or voice is straightforward, and you won't be skipping over page after page of obscure parameters.

Assigning the parameters to external real-time control, such as Lexicon's Dynamic MIDI®, is also fairly easy and comprehensive. Controllers are assigned by name and not just parameter numbers. Parameters such as Gliding Delay are smooth and glitch free, whether controlled by input level, a pedal, or through MIDI.

World Radio History

# IN REVIEW

Gliding Delay can also be controlled by the internal LFO for applications where a small amount of pitch-shifting is required to reduce the resonant quality of the digital reverb.

Using the Lexicon MRC (see Sidebar) with the LXP-15 gives the user four MRC faders to adjust four parameters per "page," moving between pages of parameters randomly with a numeric keypad. This means that even parameters such as decay time and panning are only one keypress away from each other.

The LXP-15 draws from the development of world-standard studio reverberation devices, having the range and density that you would expect from Lexicon. Each of the different reverberation settings has qualities that make it distinct. The Hall settings decay to the sides and then to the center as the signal dies away, typical of a shoebox-shaped concert hall. The presets for Rooms include more early reflections and are more colorful. The Small Rooms are particularly impressive, including a preset called No Room, which can take an absolutely dry mono recording and give it the spaciousness of a stereo mic pickup without destroying the presence or tone of the original. The Plate settings have a density and sparkle that can add a real fullness to stark tracks. Gated reverbs are flexible, cut off smoothly, and are easy to adjust to match the beat.

The equalization won't replace your parametric, but it is well-behaved and powerful enough to pre-EQ reverb sends and control the decay/regeneration. Unlike your parametric, however, the EQ can be controlled remotely using MIDI or a footpedal — even in combination with other parameters. There is also a useful range of modulation effects such as flanging, chorusing, multiple delays, pitch-shifting, panning, etc.

Lexicon has given careful consideration to the signal flow within each preset group. There is access to the mix of delay and reverberant effects and even the option of using diffusion to thicken the sound of your delays. Parameter values have not been truncated to protect the naive and will allow the adventurous (or desperate) to create effects that go over the top and all the way to the other side!

The LXP-15 may not offer the long list of effects that other processors in this price range do, but it does deliver a variety of high-quality effects that can be manipulated in a quick and convenient fashion to suit all but the most jaded producers.

*—Wade McGregor*

World Radio History

# IN REVIEW

## LEXICON MRC

The Lexicon MRC (MIDI Remote Control) is a powerful device. I recommend spending some time coming to grips with the range of control the MRC can provide. Thankfully, Lexicon has prebuilt some configurations that can be immediately put to use or modified to suit a number of applications. Once you have become familiar with the MRC menu system, the tools are all there to allow very quick access to different menu layers and parameters, using the faders, pushbuttons, or a numeric keypad.

The MRC is the size of a hard-cover book, and includes four soft switches, four assignable sliders, a number pad, and eight function switches. The two-line-by-24-character LCD display makes an annoyingly audible whine. It is easy to read, though, allowing up to eight characters to label each fader or soft-switch function. The display is verbose enough to prevent having to memorize MIDI controller numbers and those assigned to functions are displayed by name, such as "Volume" instead of the typically terse "CC7." There is also a very handy mode for troubleshooting your MIDI system, where the display will name MIDI messages received.

Stored MRC configurations are called Machines. There are prebuilt Machines to control the Lexicon LXP series of effects processors, the E-mu Proteus 1, Korg M1, and the Eventide H3000, as well as some generic MIDI messages. The generic MIDI setup can have the first-time user adjusting MIDI volume, starting and stopping sequencers, sending notes, and making program changes within minutes of connecting the MRC to a MIDI network. The generic control also acts as a template for building customized MIDI controls.

The MRC has been designed to fit easily into even very sophisticated MIDI systems. The MRC's 55mm sliders lack resolution beyond 128 steps each, which can be a problem when making a precise adjustment using MIDI, but does prevent slider movements from clogging the MIDI data stream. The MRC has so many powerful applications — including remapping incoming MIDI messages — that at first programming, it can seem overwhelming.

The MRC is capable of making the LXP-15 front panel follow you to the mixer but, when used with the LXP-1 or LXP-5, the MRC allows two-way communication, which lets you awake the sleeping giant within those simple-looking effects boxes. With a little programming effort from the user, the MRC can do as much for nearly any MIDI device. — *Wade McGregor*

World Radio History

# R-DAT IN REVIEW

EDITED BY CRAIG ANDERTON

VOICE OF THE PEOPLE gives you a forum to sound off about different pieces of gear. Here's what some readers recently wrote about DAT machines they've owned, hated, and loved.

### YOU CAN'T GET THERE FROM HERE

When trying to do digital transfers among a Panasonic SV-3500, Sony TCD-D10 Pro, and Tascam DA-30, I ran into digital/SCMS hell! Here's why:

- The DA-30 always writes the "11" status code on any recording it makes (unless you do a mod)
- The Sony TCD-D10 Pro will roll, but not play, a tape with an "11" code (unless you do the factory mod)
- The Sony TCD-D10 Pro will monitor, but not record, an SPDIF input with an "11" code (unless you do the Digital Domain mods)
- The Panasonic's "secret switch" was in the prohibit mode

Other complaints: the D-10 "Pro" can't record at 44.1 through the analog inputs. It doesn't write absolute time (unless you get the factory mod), and the digital output is nonlinear at low levels (fixed by one of the Digital Domain mods). *—Ken McGee*

### COMFORTABLY CLOSE

I chose the Panasonic SV-3900 for its remote control, which lets me locate short pieces of dialog quickly from the comfort of my Dyaxis keyboard.

Likes: AES and SPDIF ins and outs. Error display. Good meters. Peak display (though not as nice as the "margin indicator" on the Sony 2300). Fast transport. Good sound quality.

Dislikes: Won't record (via analog inputs) at 32 kHz. Can't set default for Remote/Local switch. Clumsy case design makes cleaning heads a 10-minute job. Shuttle knob could be better at slow speeds. Main deck should also have a shuttle knob, like the 3700. On top of that, it has a skimpy manual.

I'd love an SV-3900 that would record/play and chase-lock to time code without any external boxes. I'm pretty happy with the SV-3900, though, and have recommended it to several people. *—Jeff Kreines, DeMott/Kreines Films*

### THE POWER OF THREE

I use the Sony ES75, Sony PCM-2700, and Technics SV DA-10. The Sonys seem to have more robust transports and better-sounding converters. The ES75 is old and has seen the most tape, but it is still going strong. All functions are available from the front panel so you're not forced to mess with the remote.

I purchased the PCM-2700 because of the Read-After-Write heads — a must for live recording and mastering. The Technics is basically a Panasonic SV-3700 with consumer analog I/O; I modified it to record at 44.1 kHz from the analog inputs. Unfortunately it only made it for about a year before transport problems appeared, and I was less than thrilled with Panasonic's service.

I miss the lack of error indication on these machines. Perhaps they don't want us to know just how fragile DAT is! *—Richard Bugg*

### LOVE OF MY LIFE

I love the Tascam DA-30's fidelity, although there does seem to be a little high-end noise in the playback. Also, when recording low level signals, the high end suffers considerably, maybe because fewer bits are available to represent the waveform.

*—Michael Firis*

### SHARPER IMAGE

My first DAT (over two years ago) was a Sharp SX-D1000 — RCA ins and outs, slow, noisy transport, and the stereo field practically collapses. Recently I bought a Panasonic SV-3700. Much better converters, but the headphone jack is wired out-of-phase — don't use it to monitor an open mic, or you will hear a hollow sound. Renumbering cuts and relaying absolute time will work only up to a certain point in each tape. Incidentally, despite their common IEC ports, the two units will not digitally tie to each other, in either direction. *—Dan Popp*

### MY FIRST SONY

The Sony 2700's repro monitor allows me to monitor tape during the record process, which saves me countless hours of QC work. The time-search feature allows me to zoom to any exact ABS time, and pause. And, maybe best of all, I appreciate the copy prohibit on/off switch. The only feature I could do without is the manual ID write rehearsal. If you know your start times, you really don't need to listen twice and then wait for it to write the index. *—Jeff Laughinghouse*

### POWER TRIO SHOOTOUT

We recently did a shootout between the Panasonic SV-3700, Sony PCM-2300, and Tascam DA-30. They all sounded pretty good. The Panasonic sounded closest to the test CD (in deference to Roger Nichols, it was Steely Dan's "Hey Nineteen"); the Tascam DA-30 sounded a little harsh in the high end, and the Sony gave the best imaging — but also seemed to emphasize certain frequencies.

Regarding digital transfers, the Tascam DA-30 and Panasonic SV-3700 had AES/EBU balanced and IEC-958 coax ins and outs, the Sony only had IEC-958 unbalanced. Going between the DA-30 and SV-3700 was no problem; the SV-3700 IEC out worked with the Sony IEC in, but not the other way around. *—Rob Bernstein*

## TELL US ABOUT SAMPLERS

Next issue's Voice of the People is on samplers. Check out last issue for the rules. Send your views to: Voice of the People • EQ Magazine, 939 Port Washington Blvd., Port Washington, NY 11050. Or fax to 516-767-1745.

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EXCLUSIVE REPORTS DIRECT FROM EARWITNESSES

# Tiny Wunderboxes Descend Into Hands Of Astonished Musicians

## "I Knew I deserved a miracle, but three is beyond Belief!"

*By Mickey O'Callahan*

*Special Correspondent*

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## Scientists Baffled by Expressive Quality of Flying Wedge 16-bit Stereo Boxes: "Whoever built these little things obviously knows something the rest of us don't."

**While musicians rejoice the unexpected arrival of these digital processors, members of the world's scientific community are scratching their heads.** How can such such tiny parcelsproduce such expressive tone?

According to Dr. Niels Hartvig-Nielsen, of the Institute of Advanced Intelligence in Ludevisk, Finland: "First we were impressed by the efficient industrial design. Then we plugged
-rs in. What we heard was beyond the realm of
-derstanding."

and others most perplexed is
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## URE UFOs?

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he sighted the first wunderbox, which "zoomed
nto my hand. It seemed friendly enough, so I just
d it right in. Never in all of my days have I or my
rs in Wolfsnarf heard such beautiful sounds."

## Musician: "I Still Eat Tuna, But Now I Don't Sound Like One!"

**Reports from correspondent-**
**around the globe indi**
**sudden chang-**

## FIRST SIGHTINGS OCCUR ON -Y OF ELVIS' DEATH!

### Mere Coincidence — or Is The -rying to Send a Message?

**Those who remember Elvis Presley fondly tend to dismiss accounts of hi-**
**recent sightings.** But even the most skeptical among us would find it hard to di-
the miraculous appearance of three different and mysterious boxes—on the anniv-
his demise! Chris Albi and Neil Hamilton, long-time bodyguards for t-
edged in their unauthorized biography "Viva Las El-
electronic wonders. "I can still hear him saying 'I-
Albi, who is "temporari-
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## MADONNA

*continued from page 42*

was the day of reckoning — my birthday, and yet I was stuck in the studio with Madonna, Tony Shimkin, and an animal-balloon-twisting clown to celebrate it with. It was fun for about five minutes, until Madonna said, "Shep, you gotta get back to work."

**AUGUST 15, 1992 — MO'S BIRTHDAY**

One of the tracks, "Goodbye To Innocence," just wasn't working. There was something about the song that didn't grab Madonna, so we had to fix it. I worked overnight in my studio and came back to Soundworks with a brand new bass line that seemed to do the trick. .

Madonna put on headphones and got ready to lay down the vocals for "Goodbye To Innocence." But instead of singing the original words, which were written last year, Madonna started toying with the lyrics, singing the words to the lounge-lizard act staple, "Fever." At first we thought: "This is cool," and it was. It sounded so good that we decided to take it one step further and actually cover the tune. Too bad no one knew the words. What we needed was a copy of "Fever" if we were going to record it that day. So, Madonna got on the phone with Seymour Stein at Sire Records, and, within an hour, we had the lyric sheets, the Peggy Lee version, and the original version of the song in our hands. I was really impressed by how quickly we got it all. That was the last track on *Erotica* and we finished mixing it just in time to celebrate another birthday — Madonna's.

That night, she had a birthday party on a boat circling Manhattan. Picture about 50 people dancing on a boat with disco blasting out of the portholes and you get the idea. In between dancing and celebrating, I spent the time reflecting on the album. I was confident that it was a great compilation of songs, but I was wondering how people would react to it. It was definitely a different album for her in that it was a dance/pop album, instead of a guitar-laden pop album designed just for top 40. That was a conscious decision on her part because it seemed that the more pop she went, the fewer of her albums people were buying. This time, she's giving the people what they want. And it could feasibly be the best-selling album of all time. We'll see.

**SEPTEMBER – OCTOBER 1992**

After three and a half months of working in the same studio and hearing the same songs day after day, it was relief to have the album finished. Everything went smoothly except the last two songs, "Why's It So Hard" and "Words," both of which we had to recall for changes. On September 12, I walked out of Soundworks with the completed master of *Erotica* in my hands.

A month later, I went to the *Sex* party. The *Erotica* blitz was about to hit in music, video, and book form and a variety of stars were coming out for the party. Madonna herself surveyed the scene during the midnight hour. I walked over to meet her in the DJ booth.

There was all this wild stuff going around us: people tattooing one another, couples simulating sex — it was crazy. And when I went to talk to Madonna, who was in the middle of it all, our conversations turned to music. For all the multimedia extravaganzas that were braying for her attention, it was still the music that mattered and it was the record that we fawned over. I realized that no matter how far I've come, I still feel the same way that I always did.

And then she put the handcuffs on me. NOT! EQ


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## MY FIDELITY

*continued from page 114*

Jung does on his DMP label. The difference was about the same as the difference between a DAT recording and a 2-track analog recording. DISQ won't need to put out a book with all of the DISQ-equipped studios, I'm just going to have the list tattooed on my forearm.

**QUANTUM LEAP**

For you high-techies out there, Stanford University and a few other universities with linear accelerators have been taking the accelerators out of mothballs recently. Apparently, Tesla (radios, AC generators, etc.) was doing some work on particle beams in the late 1930s and early 1940s. His work was top secret and not many people knew about it. Some papers recently became unclassified and scientists went to work. Electrons are accelerated into an electromagnetic field in close proximity to a permanent magnetic field. A particle beam is regenerated when the magnetic fields are disturbed by the intrusion of the bombarding electrons. The new beam contains a trillion watts of power. So far, who cares, right? Well, here comes the good part: They discovered some time-domain anomalies during the tests. Some reactions seemed to take place just before the electron hit its target. It was as though a hole appeared in a target before the trigger on the gun was pulled. The beginning of time travel had finally arrived.

I pushed the button that switched over to the digital-domain processing. As soon as I hit the button, my whole life and the life of someone I didn't even know passed before my eyes.

You know what this means, right? At next year's AES show we may see prototypes of the first digital *advances* (as opposed to *delays*). Now anybody can be five milliseconds ahead of his or her time.

Ta ta for now, or didn't I just say that? EQ

## MAINTENANCE

*continued from page 94*

**AUDIOS AMIGOS**

This article will be my last one for *EQ*. It has been an honor and a thrill for the past three years to write about those things that make a recording studio a technically better place and less of a hassle to work in. I hope that in some small way I have been able to add to the knowledge base provided to you by the other *EQ* writers.

After nearly 28 years as an engineer, producer, and technician in this marvelous industry, it is time to move on to other pursuits. I am leaving the day-to-day studio scene to concentrate on my growing studio facility design and Macintosh desktop multimedia company. Maybe someday, I can pass along the information I learn from this endeavor to a whole new segment of *EQ* readers.

Thanks for having allowed me to be part of *EQ* since its inception. I am especially grateful for having been allowed to pass on information that was so freely given to me during my career. We are truly the sum of our parts. To play on words, I would like to say, *Audios Amigos!* EQ


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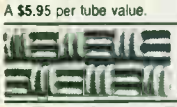

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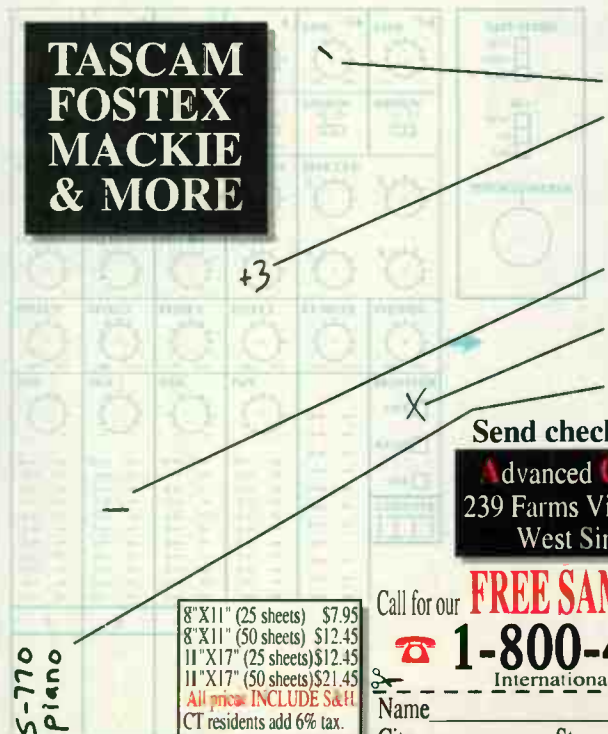


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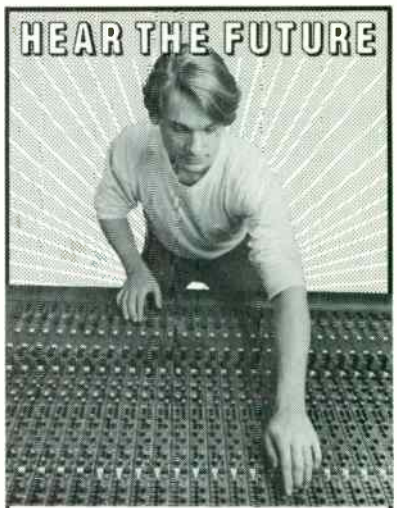


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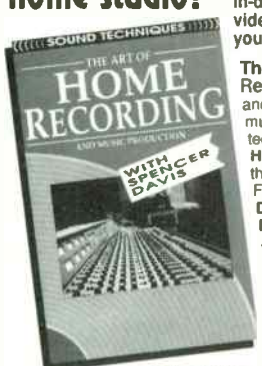

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# My Fidelity

Photo by Ed Colver

## The final word on the AES show (for this issue, anyway)

**BY ROGER NICHOLS**

BY NOW you've already read *EQ*'s Blue Ribbon winners from AES. Personally speaking, there were quite a few things that turned my head more than once (besides the Italian blonde astrophysicist).

— JVC showed what somebody called the "Swiss Army DAT." It is a small portable that resembles my kid's GO-BOT. The A/D converter slips off the DAT and can be replaced by a stereo microphone with a built-in A/D converter. Now you have a one-piece unit for interviews or for whenever you don't want to deal with detached mics and mic cords. It was pretty cool. It will also record from the analog inputs at 44.1 kHz. Only some expensive portables will let you do that.

— A PC-based hard disk audio editing system called SADiE knocked my socks off. (Of course, they did need changing after four days of wandering around the AES show.) I will give you more details soon. (About the SADiE, not my socks.)

— Roland showed its new inexpensive sample rate converter. It also has two asynchronous inputs that can be mixed together digitally. You can also VSO the input. Way hip.

— Sony showed its Super Bit Mapped CD. I could hear a little difference between the normal 16-bit and the Super Bit Mapped versions of program material, but the only way you can really tell is to use them under fire. How can you tell which is the closest to correct unless you can compare it with the original? Or maybe it shouldn't matter any more. Maybe all of these new digital things should sound better than the original. It seems to be happening a lot these days.

— Meyer Sound showed its new HD-2 studio monitors. They use a horn-loaded titanium dome tweeter and a larger 12-inch woofer. They go 10 dB louder than the HD-1's and seem to extend lower in frequency response. By the time you read this, I will have used them to mix Donald Fagen's new album. Sometimes the only time you can tell what's going on is to jump in with both feet and hope you don't break your ankles.

— I saw Tascam's entry into the 8-track digital arena. As you've read elsewhere in this issue, it is based on 8mm videotape instead of on the VHS format. Multiple units can lock up to sample accuracy, and there is an optional remote for controlling multiple units, a similar arrangement to that of Alesis. One neat feature is the plug-in SMPTE sync card that will let a single machine chase SMPTE without having to purchase the remote. If you have a stack of Tascam 8-track digitals, you only need one SMPTE sync board to lock up the whole bunch, flock, herd, gaggle, brood, or whatever you're supposed to call a group of 8-track digitals.

— Oh, by the way, Fostex announced that its 8-track digital will be completely compatible with Alesis. I have a sneaking hunch that it actually will be an ADAT with a Fostex face plate. That sure sweetens the pot for the Alesis format, doesn't it?

### BEST IN SHOW

Overall, the best thing at the show was the AT&T digital mixing box, called "DISQ." AT&T demonstrated the product with a Sony PCM 3348 playing a Linda Ronstadt tape that George Massenberg supplied. The 48 track was hooked up analog through a Neve VR console with GML automation, and monitored on Meyer HD-1 speakers. The 48 track also had a set of digital cables going to the DSP-3 box. The digital audio was mixed internally and sent to a pair of 20-bit D/A converters.

The only thing the DSP-3 used the Neve console for was control surface input. The total-recall computer would read the position of an EQ knob, for instance, and tell the DSP-3. The DSP-3 would then emulate, in the digital domain, whatever EQ, dynamics, effect sends, returns, and level control were wanted.

The tape rolled and we listened to the mix through the Neve console. That George Massenberg really pisses me off! If his recordings start sounding any better I'm going to have his fingers broken! (Sorry, I got carried away for a second.)

Anyway, the tape sounded great. Nice horns, smooth vocals, clean orchestral percussion, what more could you ask for. I then pushed the monitor button that switched over to the digital-domain processing of the same material. I got ready to try really hard to hear the difference. As soon as I hit the button, my whole life and the life of someone I didn't even know passed before my eyes. I thought my teeth were going to fall out on the floor (and they're not even false). Everyone in the room gasped. It sounded great! We started soloing tracks to see if the difference was as pronounced with individual instruments. Yup, the difference was just as pronounced. There was a clarity that you only hear on direct-to-2-track digital recordings like the ones Tom

*continued on page 109*



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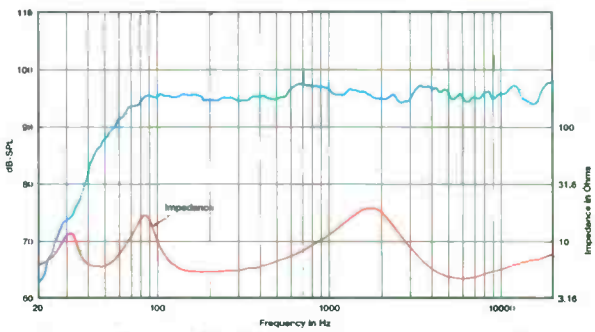
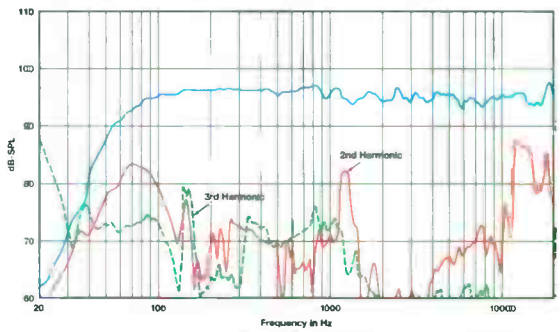



*Frequency Response (Model 4206). 96 dB at 1 m, typical console listening levels*




*Distortion vs. Frequency (Model 4208) 96 dB at 1 m, typical console listening levels (distortion raised 20 dB)*

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