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PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

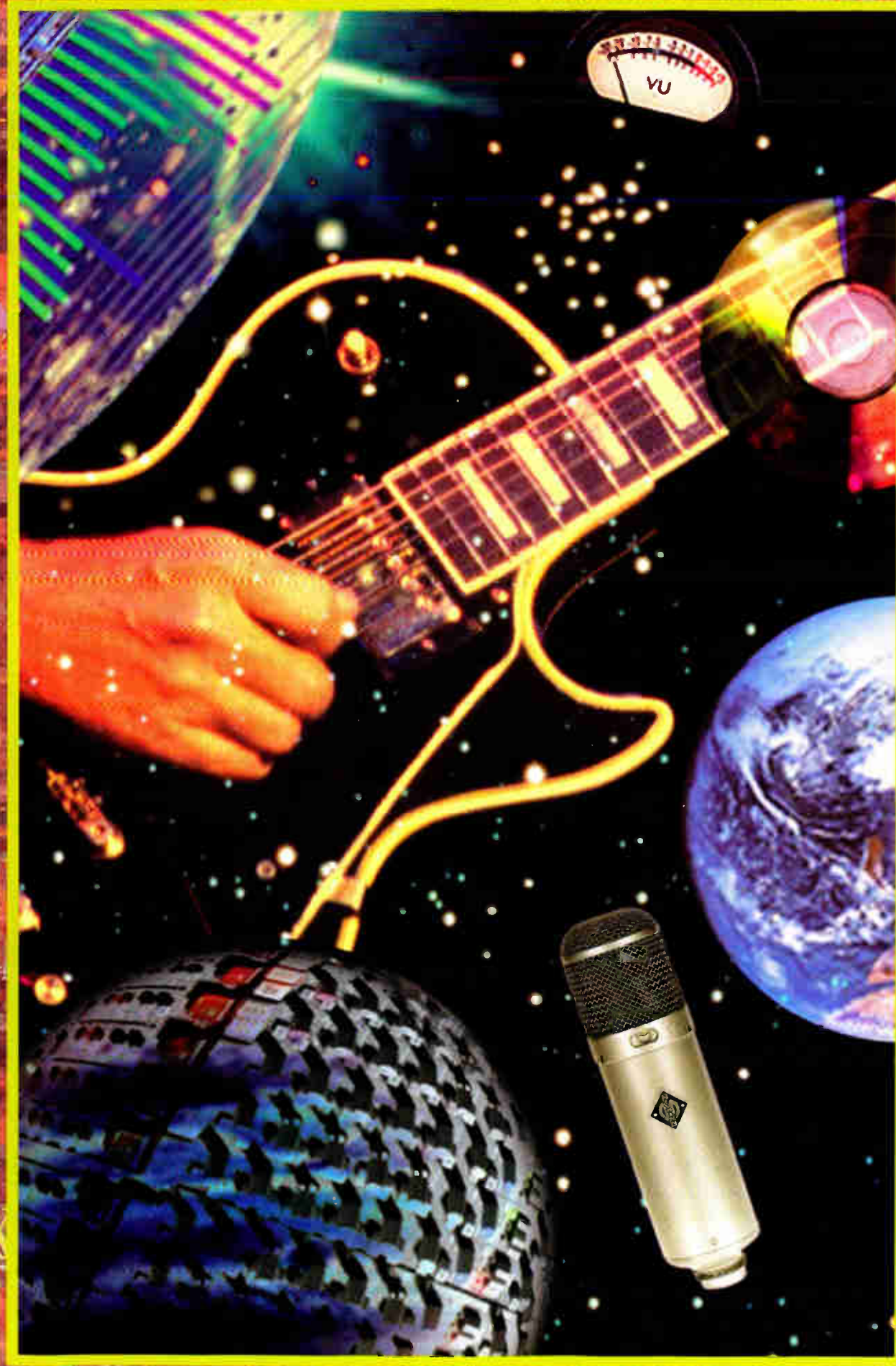
Tales From
Two Decades
Of Pro Audio

Special Anniversary Issue!

20 years and counting...

A TECHNOLOGY
RETROSPECTIVE:
EVOLUTION OR
REVOLUTION?

A Supplement to MIX



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SL 9000



"I am a studio owner and a professional racecar driver. In the world of racing, the winning team talks about a 'package' consisting of engine, chassis and tires. Professional recording studios look for a console 'package' which includes sonic quality, flexible features, usability, and good service from the manufacturer. For Conway Recording Studios, the SL 9000 is the winning package."

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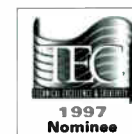


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to **MIX** on
magazine

your 20th anniversary

from your friends



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World Radio History

from the editors

Welcome to our special 20th anniversary issue of *Mix*.

To those who have been here from the beginning of this remarkable odyssey, it doesn't seem possible that two decades have passed since *The Mix* was launched as a one-shot directory of recording studios in the Bay Area. The changes we've seen, in both this publication and the pro audio industry, have been so many and so mind-boggling that these 20 years seem more like a lifetime. For better or worse, the changes have transformed a once small and easily defined industry (and a small but very ambitious magazine) into forces that have had a tremendous effect on the lives of millions. Maybe it sounds pretentious, but the music and sound industry, as chronicled in these pages, has truly changed the world, and we're proud to have been a small part of this revolution.

In this retrospective, we wanted to give a glimpse of the history of not only *Mix*, but the people, companies and events that have shaped professional recording and sound production since 1977. We have tried to spotlight the prominent figures, the movers and shakers, the groundbreaking trends and products that have made our industry the worldwide force that it is. Having said that, we know that there will be people and companies that we may have omitted. If you are among the missing, please don't hold it against us; the limited size of this publication made it impossible to include everyone.

It's been quite a ride these past 20 years, from the good old days of 8-track analog and razor blade editing to the brave new world of multiple digital formats and 48 tracks in the spare bedroom. We at *Mix* have tried our best to give our readers both the broad picture and the essential details—not an easy task. We like to think that most of the time we've succeeded, and the fact that many of you have been reading since that first tabloid issue in September '77 is proof of sorts.

We hope you enjoy this "Twenty Years of *Mix*." Without you, it would not have happened. Thanks.

The Editors



Above, the 1997 Mix staff on the steps of the Emeryville, Calif., headquarters. Far left, the men and women in black from the New York office. At left, the Los Angeles duo take a break outdoors.



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contents

8 The Way It Was:
The Birth of *Mix*
Magazine
by Hillel Resner

24 20 Years From
the Pages of *Mix*
compiled by
Tom Kenny

42 Studio Survivors:
12 Who Beat the Odds
by David Schwartz

58 A Technology
Retrospective:
1977-1997
by George Petersen

82 Lead Vocals:
20 Who Saw It All
by Hillel Resner

98 Legendary
Lunchings: The
Best of Mr. Bonzai
by Mr. Bonzai

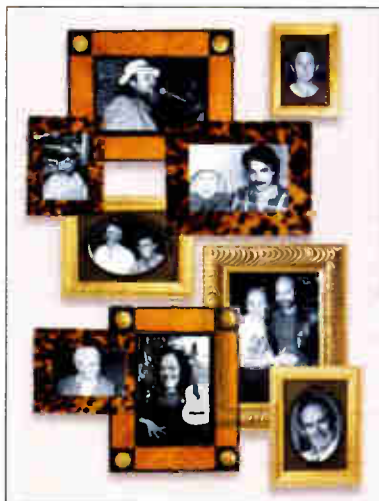
102 In the Category of...
12 Years of TEC
Awards Highlights
by Karen Dunn

108 The Crystal Ball:
Seven Views of
Where We Are and
Where We're Going
by Blair Jackson

112 Ad Index



Page 58



Page 98



Page 108

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Founded in 1977

by David Schwartz and Penny Fiker Jacob

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Talent. Hard work. A little luck. And the right equipment. That's the stuff that legends are made of.

Legendary musician, producer and engineer Alan Parsons has recorded some of the most iconic albums in music history. From the lush, orchestral soundscapes of *The Schizoid Man* to the raw, powerful rock of *The Gnome*, Parsons has been at the forefront of musical innovation for over four decades. And he's always had the right equipment to capture it all.



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Alan Parsons and the new AT4033

Alan Parsons will be using Audio-Technica AT4033 microphones in his upcoming work. Audio-Technica is proud to be a part of his creative process.

Audio-Technica goes on stage 'live' with Jeff Cox!



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Thanks to
Mix
for the place to
tell our story...

Our 40-Series microphones are building great reputations!



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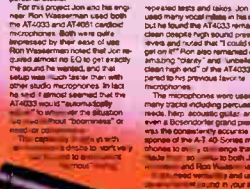
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Jon Anderson says "Yes" to Audio-Technica 40-Series microphones.

Jon Anderson is one of the most innovative of today's leading musicians. Co-conductor of the seminal rock group Yes, he has made his name in the music industry for over four decades. And he's always had the right equipment to capture it all.



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Worth its weight in gold—and platinum. Tony Brown discovers the AT4050 studio microphone.



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We asked Phil Ramone to field test our new AT4033 studio condenser microphone.

He wouldn't give it back!

Phil Ramone knows exactly what he wants from a studio microphone. After all, he's tested a lot of them. And now he's got the AT4033 studio condenser microphone. He won't give it back. He's got it for good. And he's got it for good reason. The AT4033 is a true studio microphone. It's got the sound that's been missing from the studio for years. It's got the sound that's been missing from the studio for years. It's got the sound that's been missing from the studio for years.

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Two Studio Veterans Team Up.
Ed Cherney and the AT4033

Ed Cherney is a two-time Grammy Award-winning producer. He's got the sound that's been missing from the studio for years. He's got the sound that's been missing from the studio for years. He's got the sound that's been missing from the studio for years.

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to our endorsers
for the story to tell.



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...they don't fold under pressure!

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The Way

The Early

Nineteen seventy-seven was a time of longer cars, longer sideburns and longer attention spans. It was also a time when it took a lot longer to get information. We had no fax machines, no personal computers, no Internet and—to the consternation of a least two people in Marin County, Calif.—no comprehensive directory of recording studios, where a musician or producer could turn for information on this rapidly growing field. David Schwartz and Penny Riker Jacob—the former a musi-

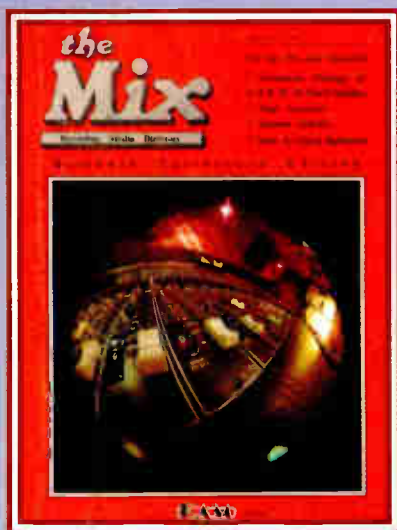
cian and engineer, the latter a singer who also did voice-over work—felt there might be a need for such a publication. The expression “They didn’t know what they were getting themselves into” never applied more than to these two dreamers in the spring of ’77.

Looking back on those days from the lofty vantage point of 1997, when *Mix* has become the world’s preeminent magazine for professional recording and sound, it seems more than a little strange that this venture was launched in the San Francisco Bay Area, much less that it would actually be successful. After all, the big-time centers of recording, the homes of major record labels, were 400 and 3,000 miles away, in Los Angeles and New York. It should be remembered, however, that the Bay Area spawned much that was revolutionary in both music and culture in the 1960s and ’70s. Beginning with Haight-Ashbury’s Summer of Love in 1967, San Francisco was a magnet for bands and musicians, giving birth to such seminal groups as the Jefferson Airplane, Big Brother & the Holding Co. (with Janis Joplin), Santana and the Grateful Dead. They “did their thing” in such hallowed halls as the Avalon Ballroom, the Straight Theater and—setting the stage for a whole new industry—Bill Graham’s Fillmore Auditorium.

And the bands recorded here, too. Few of the studios that hosted them remain today (two are profiled in this issue), but the 16-track listings in the first issue of *Mix* attest to their existence: The Automatt, Beggs/American Zoetrope, Coast Recorders, Different Fur, Funky Features (now Russian Hill), Wally Heider Recording, Music Annex, Pacific Recording, the Record Plant...

Over in Marin County, there was an 8-track operation called Tres Virgos Studio. Owned by engineers Alan Rice and Robin Yeager, and Mike Stevens (later business manager of *Mix*), the studio was also the hangout of David Schwartz and Penny Riker Jacob. Both Midwestern transplants, the two had come to San Francisco, if not with flowers in their hair, certainly with music in their souls. While working with the Tres Virgos team—writing songs, producing demos and jingles—they began to realize they were in the middle of an expanding universe.

by Hillel Resner



First cover

it Was

Days of Mix



The Mix staff in 1978. Bottom: Penny Jacob; middle (L-R): Bill Laski, Skeeter, David Schwartz, Mary Loman; top: Sandy Cann. Inset: Proud father David Schwartz displays the first issue of The Mix.

Jacob: It was a very exciting time. If you look at that period from the late '70s through the '80s, there was a real growth spurt in technology and the music business. A lot of wonderful things were happening—multitrack, all of it just exploded during that time.

Schwartz: From that point, because the equipment became a little more affordable, you didn't have to be a pro audio business-type to have a studio. You could kind of get in the game as a producer or as a musician or an independent engineer and be very valid with equipment you could buy and use in your own place.

Jacob: We were at the same level when we started the magazine as a lot of these people. We were starting a little studio, and we were very interested in it, and we wanted to make it a success. We wanted to know where the studios were and how much they charged and what kind of equipment they had.

Although *Billboard* magazine published a directory that included recording studios, Schwartz and Jacob believed a publication that provided more detailed information might appeal to the burgeoning population of both professional and semi-professional recordists. Neither Schwartz nor Jacob, however, had any experience in publishing. So in December 1976, they approached Dennis Erokan, publisher of *BAM*, a Bay Area music magazine, with the idea of putting out a directory of studios as a supplement. Erokan was receptive to the idea and assigned Bill Laski, *BAM*'s advertising director, to work with the fledgling publishers.

Erokan: The music industry in the Bay Area was not only taking off, but the infrastructure around the musicians was forming, and there was a sense of pride in the area. David and Penny came to me with the idea of taking the recording studio side and really running with it. It seemed like a can't-lose idea.

BIRTH OF "THE MIX"

Assisted by the staff at *BAM*, Jacob, Schwartz and Laski began the task of identifying and contacting as many recording studios as they could find in Northern California. Relying primarily on phone book listings and whatever information they could glean from music publications and local pro audio retailers, the group began building a database (on paper, of course; it would be a number of years before *Mix* acquired computers). Studios



The staff, circa 1981. Bottom (L-R): Mary Holland, Ellen Goldstein; middle: Gail Rosenberg, Debbie Russell, David Schwartz, Penny Jacob, Susan George; top: Tim Gleason, Hillel Resner, David Gans, Bruce Dancis, Mike Stevens.

were mostly called on the phone, and the intrepid reporters also visited as many facilities as they could, asking questions and taking photos. In those days of typewriters, typesetting and paste-up, it was a staggering amount of labor.

About nine months later (appropriately enough), in September 1977, *The Mix* was born. An introductory letter from Schwartz and Jacob declared the publication's purpose.

"The recording scene in Northern California is bursting with musical talent, well-equipped facilities, creative thinking and unlimited potential. *The Mix* has been put together to increase the communication in this mysterious and often misunderstood world of professional and semi-professional recording. As the first comprehensive studio directory, *The Mix* will fill an information gap for musicians, producers, engineers and others."

Published on newsprint, tabloid-sized, with a four-color photo of a recording console (a Harrison) on the cover, this "Special Issue of *BAM*" ran 72 pages and featured listings of 112 studios in the greater Bay Area, divided according to the number of recording tracks.

In today's world of MDAs and disk-based recorders, where the number of tracks a studio offers does not neces-

sarily define its creative capabilities, the 4-, 8- and 16-track listings of the *The Mix* seem not only antiquated, but downright quaint. But at that point in the development of the industry, to open up a publication and see this array of studios, both on the entry level and cutting edge of the multi-track revolution, was both thrilling and challenging.

The Mix provided a medium for this exploding creative milieu to publicize and become aware of itself. For the first time, the folks at a place like Paradise Studio in Glen Ellen, whose listing in *The Mix* said they had a Speck 16x8 mixer and Otari 5050 ½-inch 8-track, could riffle through the pages of a magazine and learn that Funky Features in San Francisco had a 3M 16-track and a board that was "a charming antique combination of Anipex and Shure mixers." Here was a publication that gave detailed information about a business that, until then, had in many ways been underground.

*Schwartz: I think we helped to show them that they weren't isolated, in a kind of business that was very isolated generally. Before *The Mix*, how did people know where a studio was, or what was in it? These places didn't have signs over the doors, you couldn't walk in and kick the tires...What we were able to do was show that every-*

body was in the same boat.

In addition to the studio listings, which were the backbone of the magazine, the first issue of *The Mix* also included articles like "How to Make the Most of 4-Track" and "Standard Requirements for a Proper Master Tape." Then, as now, it was practical information for people trying to make recordings, and the template stuck.

NO TURNING BACK

To say that the premier issue of *The Mix* was a wild success would be an overstatement, but it did receive a lot of notice and it generated quite a bit of excitement in the recording community. About 40,000 copies had been printed and were distributed free through the *BAM* circulation chain to studios, pro audio retailers and other music-related establishments. It didn't take long for word of *The Mix* to spread.

Jacob: When that first Northern California issue came out, everybody else was saying, "Hey, when's ours coming out?" All of a sudden, people in L.A. and New York and everywhere else were saying, "We need one of these for our town." So at that point, the magazine acquired a life of its own, because it was very much market-driven.

In November '77, Schwartz and Jacob headed to Los Angeles, where they spent a month visiting studios, talking to the owners, taking photos and getting people to fill out questionnaires. This time, it didn't take nearly as long to produce a final product, and, in February 1978, the first Southern California edition of *The Mix* arrived. It was 56 pages and contained listings of 155 studios, ranging from 4- to 24-track facilities.

Included in the listings were such venerable studios as A&M, Capitol, Cherokee, Conway, Devonshire, Larabee, Record Plant, Sound City, Sunset Sound and Village Recorders—all still around today, though possessing distinctly different equipment than they listed then. Also included was a listing and full-page ad for Brother, the Beach Boys' studio, featuring a photo of a swim-suited surfer rushing into the studio with his surfboard under his arm. (You had to be there.)

After the second issue of *The Mix* came out, it started to become apparent that this "one-shot" publishing venture just might have a future. Studios were turning up everywhere, and it seemed clear there was an ongoing need for the information *The Mix* was providing. Schwartz, Jacob and Laski

also began to realize that their direction was diverging from *BAM*'s, which was focused more on the interests of musicians. *BAM* was aimed at the consumers of the market served by *The Mix*, which was shaping up as more of a trade magazine. In March 1978, Schwartz and company met with Erokkan and negotiated a buyout of the magazine. *The Mix* was on its own.

IN BUSINESS

In the spring of 1978, operating as Mix Publications, the new publishers set up their own offices in Berkeley—in Laski's house. The first thing they needed was an art director, and, at the suggestion of a local quick printer, they hired the elegantly named Henry Harrison McUmber—"Skeeter," for short. With the addition of typesetter Sandy Cann and editorial assistant Mary Lowman, the staff was in place—and they had their work cut out for them.

Jacob: That initial group of six people worked incredibly hard. We're talking about 14-hour days, intense energy—because we were all high-energy people.

Schwartz: We were on adrenaline... It felt like we were on a mission. There was a real sense of purpose there—that we were doing something that people had responded to, and the best thing we could do was exactly what we were doing—and the faster we could do it, the better.

The second Northern California edition—the first to be published by Mix Publications—came out in April 1978, with 80 pages and 118 studio listings. A second Southern California edition appeared in September and had the

distinction of being the first—and the last—issue of *The Mix* to be hand-delivered by the publishers. Having lost the services of *BAM*'s distribution network, Schwartz, Jacob and Laski, assisted by some friends in Los Angeles, drove from studio to studio, dropping off bundles of the magazine from a station wagon and Laski's BMW. Talk about class.

Having successfully launched the studio directories, the publishers decided it was time to branch out and provide listings of new pro audio equipment, the lifeblood of the growth taking place in the industry. In November '78, timed to coincide with the AES convention in New York, the first *Mix* New Products Directory was published. Featured in this first-of-its-kind directory were such then-cutting-edge products as the Ursa Major Space Station digital delay reverb, the White Instruments 4300 1/2-octave equalizer, Auratone's Model 5PC Super Pro-Cube monitors, Shure's SM81 studio condenser mic, Sound Workshop's ARMS automation system, the Tascam Model 15 mixer, the Otari MX-7800 1-inch 8-track recorder and the Marshall 5002A Time Modulator (developed by future *Mix* columnist Stephen St. Croix).

Lacking the funds to have the New Products Directory shipped directly to the AES show, the *Mixers* had the magazines flown to New York, then loaded the several thousand copies into a station wagon and drove them into Manhattan.

Jacob: The thing I remember is that the load was so heavy in the back that the front wheels were lifting off the ground! And then we got to the Wal-



Serious journalists: David Schwartz, Penny Jacob and Hillel Resner, circa 1986.

There's lots of hype these days about PCI digital audio recording systems. Companies spend a ton of money on advertising, claiming future support by a myriad of different software companies. What are we supposed to do? We need instant solutions! Our projects are due now not "soon".

Emagic, known for its integrated professional MIDI, Digital audio and Scoring software has created a cross-platform, PCI busmaster digital audio recording card with 8 discrete outputs for less than \$800: Audiowerk8. Since the product's launch last Spring, thousands of users worldwide have attested to the incredible ease of installation and use and the warmest analog to digital conversion in the business. The Audiowerk8 works on both Windows and MacOS computers just like Logic Audio, the sequencing software it was designed to work with from the start.

Version 3.0 of this award winning music production tool now offers a rich complement of real-time DSP effects such as Equalizers, Filters, Reverbs, Chorus, Flangers and Delays with up to 8 inserts and sends per track, depending on your CPU.

The combination of Logic Audio 3.0 and Audiowerk8, allows the completion of professional production jobs on a very tight budget.

There's a whole slew of new features such as: punch in on the fly, cycle recording, contiguous synchronization of audio to MTC and much more. You can even use 2 Audiowerk8 cards and get a total of 24 physical audio tracks and 16 outputs.

Rather than calling a dozen companies to get a technical issue resolved, make a single call to a single source and get back to work. Compatibility and support problems become a thing of the past.

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dorf and we hadn't signed up to get the magazines into the show through the exhibitor. We had to bribe this poor old bellhop—the guy must have been 85—to store them for us and cart them onto the floor whenever we needed more magazines.

Schwartz: We had one hotel room for five people. There was one queen-sized bed, so two people slept on the box spring, two slept on the mattress on the floor and one slept on the couch!

The comparison between *The Mix* and a rock band was an apt one in 1978.

GIMME SHELTER

In 1979, the magazine moved to a relatively palatial two-room suite of offices, above a Seikh-owned holistic massage parlor in Albany, next door to Berkeley. The staff of *The Mix* found themselves in a nonstop whirlwind of activity—devising questionnaires, culling information from phone books and other sources, making hundreds of phone calls, designing and re-designing the magazine—as they sought to re-create and then refine the formula for collecting and distributing information.

Besides the directories—which would remain the bulk of the magazine for some time—increasing attention was paid to publishing articles on topics of interest to readers. In those first couple of years, *The Mix* printed interviews with the legendary Wally Heider, Record Plant's Chris Stone, producer Malcolm Cecil and engineers Biff Dawes, Doug Sax and Fred Catero. Articles were published on signal flow (Craig Anderton), TDS, PZM and LEDE® (Don Davis), SMPTE timecode

(Ed Lever) and fiber optics (Dr. Richie Moore). And, taking a tentative step into humor, in May '79 *The Mix* published its first article by a former studio manager named Mr. Bonzai. Apropos of the time, it was entitled "Discoland."

The staff was growing, as well. In the September issue, Tim Gleason and Hillel Resner made their first appearances on *The Mix*'s masthead. Gleason went on to become art director the following year—a position he holds to this day—and Resner became advertising director in 1980 and publisher in '88.

Resner: I was running an 8-track studio in San Francisco called Perennial Music, mostly doing song demos and records for local bands. Money was tight, so one day I called up The Mix to see about getting a listing as an independent engineer. And I started talking to this guy named Bill Laski, who after a few minutes told me they had a job opening "in promotion." Well, I was always a promo kind of guy, so I said I'd come and talk to them. The next thing I knew, I was selling ads to other studios!

About this time, also, the publishers undertook to upgrade the appearance of *The Mix*. Switching from newsprint was not really an option in those cash-strapped times, but they were able to improve the overall look by changing the cover stock from newsprint to a matte paper that was both sturdier and glossier, more like a magazine and less like a jazzed-up newspaper.

Expansion was in the air, and Schwartz, Jacob and company started looking at extending *The Mix*'s coverage beyond the borders of California. In October 1979, the first New York edition was published. Featuring a photo of Soundmixers' Studio D on the cover, it included an interview with Howard Schwartz and a young architect named John Storyk, discussing the design and construction of Schwartz's new studio. It was accompanied by a photo of a long-haired and bearded Howie Schwartz, wearing cowboy boots.

Following another AES issue, the first Nashville edition of *The Mix* was published in December 1979. It was actually Nashville and Memphis, and besides listings of 57 studios, it included an interview with producer Jack Clement (whose Studio B was featured on the cover) and an article on Muscle Shoals Sound. *The Mix* had now gained a foothold in all the major U.S. music markets.



You can do anything with computers—art director Tim Gleason, 1987.

GROWING PAINS

By 1980, *The Mix* had found a look, an identity and an expanding audience; it was also beset by all the problems faced by a young business starting to grow. The staff had by now increased to a dozen people, all crammed into two rooms. The folks in the massage parlor downstairs were probably starting to wonder what all the noise was. The magazine needed space; and, having launched a sister publication in mid-'79 called *Musicians Industry (M.I.)*, it also needed money.

Jacob: I'm fond of telling people that the way we knew we were successful was that the day we started we were \$21,000 in debt, and less than three years later we had multiplied that by ten!

Schwartz: We had extended our credit as far as it would go, but it was not a business that was failing, it was a business that was growing, so we had to find people to help us along, to give us better terms and help us finance it.

As fate would have it, one day Jacob got a call from a local businessman looking for information on the recording industry. He came over to the offices of *The Mix* and, after viewing the operation, suggested they talk to an associate of his who was renovating an office building in west Berkeley.

Rudy Hurwich was a successful venture capitalist who had been involved with a number of businesses connected with the arts. He had a soft spot in his heart for creative people with an idea and a passion, and he saw something in the young entrepreneurs.

Hurwich: I'm one of those crazy guys who invests based upon my feelings about the people, as well as upon the enterprise...I really got captured by



"You talkin' to me?"—the young George Petersen, 1986.



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the enthusiasm of these young people who had something unique—a combination of enthusiasm and know-how in a niche field. If you know what you're doing, you can mine that niche for gold.

Although Hurwich didn't invest immediately, he did give *The Mix* a favorable deal on a suite of offices in a light, airy building he had just remodeled in west Berkeley, across the street from Fantasy Studios. In the summer of 1980, the magazine moved to 2608 Ninth Street, where it would remain for the next eight years.

IT'S A MAGAZINE

In their new offices, with room to breathe, the crew of *The Mix* set about creating a more professional publication. The magazine had become a monthly in September '79, and in July 1980 it made the jump from a tabloid to a standard-size magazine, printed on coated paper, with four-color advertising throughout. And, in another major move, *The Mix* became simply *Mix*.

Other changes followed quickly to what had become a widely read magazine, with readers throughout most of the U.S. When the decision had been made to go monthly, the publishers realized that *Mix*'s directories would need to expand beyond the four geographical regions (plus new product listings) that had made up the magazine to this point. In 1980, the first Tape-to-Disk issue was published, featuring listings of mastering facilities and record pressing plants, and in 1981, a parade of new directories graced the pages of *Mix*. The first listings were published of Texas and the Southwest and the North Central U.S. (mainly Chicago); a Video Focus special issue examined the growing field of audio for video, then being fueled by the emergence of music videos; a Recording Services issue looked at audio education, remote recording

and studio maintenance; and that August, the first issue devoted to acoustics and studio design was published. The audio industry was growing, and *Mix* was trying to cover all the bases.

In this period, too, *Mix* began to become more of a magazine. That is, while the listings were still the backbone of the publication (and the feature that continued to draw new readers from around the country), more thought was being put into the articles, into finding competent writers and covering what were then the hot topics in pro audio. Larry Blakely, in his column "Progressions," wrote *Mix*'s first article on "digital audio discs"—a year before their introduction; in "Studioscope," Dennis Buss and Chris Haseletu explored the business side of running a studio; Dr. Richie Moore and David Schwartz wrote about console automation, discussing such products as Harrison's Auto-Set, Neve's Necam and the SSL Studio Computer; John T. Mullin wrote about his development of the first U.S. tape recorder; Wendy Germain contributed *Mix*'s first article on "Women in Audio"; Bruce Pilato talked to Todd Rundgren about making music videos; Ed Long discussed the breaking technology of near-field monitoring; and on "The Other Side of the Tracks," Mr. Bonzai took a humorous look at studio life in such fictionalized accounts as "Gunfight at the EQ Corral."

NEW FACES

With the increase of editorial content beyond the directories, it became apparent to the publishers that additional staff was needed to edit and manage the growing flow of copy. Of course, financial resources were still limited, and trained editors weren't begging to go to work for five dollars an hour. In December 1981, in hope of finding some help, an ad was run for a "semi-part-time" proofreader in the University of California newspaper. In what turned out to be a large bit of luck for *Mix*, a local musician and production professional named George Petersen answered the ad.

Petersen: I was producing multimedia programs and teaching college classes in cinematography, film editing and sound design at various schools around the Bay Area. And I wasn't making enough money—I was working nights as a union theater projectionist. I had an interview with David and Penny, and I told them I had read



Organized—executive editor Blair Jackson, circa 1986.

Mix since day one and knew all about the products and technology involved. They didn't want to hire me because they thought I was overqualified. So I asked them if they thought they were under-qualified, and they couldn't come up with an answer to that. I started working the next week.

Although hired as a proofer, within weeks Petersen was writing feature articles, and on one occasion, when both publishers left the country to attend a European AES show, he had to put together an entire issue (May '93) by himself. Being able to run with the ball was a prime job requirement in those days, and Petersen rose through the ranks, eventually becoming product editor, then senior editor and, on Schwartz's departure in 1994, the editor of *Mix*.

Not long afterward, another need was answered when *Mix* sought a managing editor to deal with outside writers and bring some order to the growing number of articles to be scheduled and edited. Blair Jackson, the longtime managing editor of *BAM*, applied for the job and was speedily accepted.

*Jackson: I was brought in, basically, to organize the editorial department at the behest of the art director, who was going insane. I knew nothing about audio—I was a real babe in the woods. I came from music criticism and years at *BAM*, and my recording studio experience consisted of going to a listening party at Fantasy Studios for a new Journey album and interviewing Rick James at the Record Plant. I thought the console was the recorder!*

During this period, another key player would come on the scene, much to the relief of then-ad-director Hillel Resner. No longer able to keep up with increasing volume of advertising (the November 1982 *Mix* was a staggering 182 pages in size), Resner hired a young refugee from Los Angeles as a sales rep. Jeff Turner had been



Cindy Lukk and Jane Byer at the TEC Awards, 1991.

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a recording engineer at United Western studios; he had no sales experience, but he definitely knew the difference between a mixing board and a tape machine. After logging several hundred thousand miles on airplanes, Turner would eventually become associate publisher and, in 1997, publisher of *Mix*.

Like all magazines (all companies, for that matter), *Mix* would experience its share of staff turnover through the years. In many areas, though, it has been amazingly low; more than one-third of the staff whose names appeared in the 15th anniversary issue (1992) are with the magazine today, or work for it as freelancers. Many, like Anne Letsch, director of operations and manufacturing, who joined *Mix* as production manager in 1984, find it hard to imagine working anywhere else.

Letsch: Nothing ever stays the same here. That's part of the challenge, but also part of the appeal, because things aren't stagnant. We've grown, we've got different products, and I've been part of the growth. And the people here are dedicated to their products, they have a passion for it.

THE SWEET SMELL OF SUCCESS

Between 1982 and 1987, as the recording industry expanded and digital technology took center stage, *Mix* experienced a sensational period of growth. Its main competitor in those days was *Recording Engineer/Producer (RE/P)*, a venerable, long-established magazine that was based in Los Angeles and rooted firmly in the large studio recording market. The *Mix* publishers and staff saw that the audio industry was growing in new directions beyond the traditional studio, and that less-expensive technology was creating a whole new landscape of music and sound production. The recording schools that *Mix* had been the first to

write about and include in its directories were turning out thousands of aspiring professionals; independent studios, armed with cost-effective multi-tracks, were springing up left and right; a new emphasis on high-quality sound in movies and television was bringing about a revolution in post-production; and technological advances in live sound reproduction were changing the face of sound reinforcement from small clubs to arenas. *Mix*, with a small army of capable, well-informed contributors, was writing about all these topics—for the people who were doing the day-to-day work.

The publishers of *Mix* made a deliberate effort to expand the magazine's circulation beyond the 20,000 or so people who had been traditionally defined as the "core" of the industry. After *M.I.* magazine—*Mix*'s musician-oriented startup—had to be folded in 1981 (a casualty of the recession), the publishers incorporated some of its content in *Mix* and set out to place *Mix* on newsstands. It was a move that brought the magazine to the attention of many new readers and also created a new revenue stream for the struggling company. By 1985, when *Mix* became the first audio industry magazine to have its circulation audited by BPA (the business magazine auditing bureau), the magazine had a total circulation of more than 25,000. By 1990, that figure would nearly double.

As the '80s progressed, *Mix* also grew in size. The October 1983 AES/new products issue was a mammoth 268 pages, and the following year's AES issue hit 300 pages for the first time ever—something *Mix* readers would become used to as the years went by and they struggled to squeeze copies of *Mix* into bulging trade show lit bags.

CHANGES 'R' US

As the photos and other articles in this special issue will attest, the changes in both the content and appearance of *Mix* have been many over the years.

The magazine has been redesigned four times (in '80, '87, '91 and '94), and, in 1991, the subtitle of *Mix* was changed from "The Recording Industry Magazine" to "Professional Sound and Music Production."

In 1988, *Mix*'s directories of audio facilities and services were consolidated for the first time in an annual directory. In 1994, the listings on which *Mix* was founded were removed from



Publisher Jeff Turner and Anne Letsch, director of manufacturing, 1989.

the magazine altogether, replaced by an annual publication now called the *Mix Master Directory*.

In 1985, *Mix* launched the Technical Excellence and Creativity Awards, the first program to recognize the achievements of "behind the scenes" audio professionals. Since then, the TEC Awards have become an enormous success, each year bestowing much-deserved honors on the stars of our industry, as well as the innovative products that drive this amazingly creative field. (For more on the TEC Awards, see page 102.)

Electronic Musician, which *Mix*'s publishers purchased in 1985 when it became clear that the MIDI revolution deserved a magazine of its own, has gone on to become the premier publication in its field and a success story in its own right.

Several new publications and special supplements have been launched, as well, including *Hypermedia* (1988); the *Mix Spanish Edition* (1990); *Live Mix* (1993); and *Sound for Picture* (1994). Some of these have thrived, while others have been discontinued; but they have all provided a wealth of information for recording and sound professionals.

Mix Bookshelf, begun as a simple one-page resource guide in *Mix* in 1982, has grown to become the leading mail-order service for books and other information software on recording and sound. Hundreds of thousands of catalogs are mailed annually to musicians and sound professionals throughout the world.

MOVING ON

As a business, *Mix* has been through many changes as well, something not unusual in the competitive economic climate of the late '80s and early '90s. In 1988, soon after moving to new



Rudy Trubitt and Robin Boyce-Trubitt at the TEC Awards, 1993.



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quarters in Emeryville, Calif., *Mix*'s publishers realized that for the company to continue to grow, it would require more capital than they had ready access to. So, in January 1989, *Mix* Publications (including both *Mix* and *Electronic Musician*) was sold to Act III Publishing, a newly formed company owned by television mogul Norman Lear. Shortly thereafter, Penny Riker Jacob left *Mix* and returned to the studio business (today she is an editor at Microsoft in Seattle).

Although the association with Act III proved to be a bumpy ride (Lear found the waters of the publishing world a little too rough and returned exclusively to television and movies), *Mix* experienced its greatest growth period during the following five years. Fueled by the expansion of the audio industry that resulted from low-cost digital formats, the magazine continued to increase in both size and circulation. By 1994, more than 50,000 copies a month were going out to readers in nearly 100 countries, and *Mix* was averaging 224 pages an issue.

That year, the company was sold to Cardinal Business Media, a publishing conglomerate in Philadelphia, and *Mix* became one of the jewels in its crown. David Schwartz left shortly thereafter to pursue a career in multimedia, a field he had championed since its earliest days. Hillel Resner, the last member of the triumvirate that had run the business since the early '80s, added editor-in-chief to his publisher title and headed the magazine until the end of 1996, when he resigned to run the *Mix* Foundation and TEC Awards. Jeff Turner then took over as publisher of what is the leading pro audio magazine in the world.

If *Mix* today—like much of the industry—is a little more “corporate” and a little less free-form than it was in those heady days of '77, it has remained true to its original mission of “increasing communication in this mysterious and often misunderstood world of professional and semi-professional recording.” We don't always get it right—and when we don't we can count on readers and advertisers to tell us (in faster and faster ways, in this brave new world of e-mail); but we always try our best to write about the subjects that readers care about—which, fortunately, happen to be the ones we care about ourselves. As David Schwartz used to sign his monthly editor's letter: “Keep reading.” We'll keep writing. ■



Musician's Industry (M.I.): Launched by *Mix* in 1980, *M.I.* featured stunning cover photos of electronic instruments and articles that examined the latest trends in music technology. Edited, in various incarnations, by Dan Forte, Steve Carraway, Bruce Dancis and David Gans, *M.I.* did not survive the recession of the early '80s—but its spirit lives today in the pages of *Electronic Musician*.

Electronic Musician: In 1985, MIDI technology was revolutionizing the music industry—and popping up more and more in the pages of *Mix*. Rather than shift their own editorial focus, *Mix*'s publishers decided to buy a tiny magazine edited by musician and author Craig Anderton. The road wasn't easy, but thanks to strong editorial and a dedicated staff, *EM* now has a circulation of more than 62,000 and is read by technology-hungry musicians throughout the world.



HyperMedia: Published as a special edition in the summer of 1988, *HyperMedia—The Guide to Interactive Media Production*, anticipated the coming of electronic convergence and the Age of Digital Media. From digital workstations and CD-ROM to the visions of Ted Nelson and John Scully, *HyperMedia* was about the technology that was (then) lurking around the corner.

Mix Spanish Edition: First published in 1990, *Mix—Edición en Español* began as a special supplement aimed at the growing pro audio market in Mexico. Under the editorial leadership of Alex Artaud, the Spanish Edition grew to become a quarterly in 1994 and a bi-monthly the following year. The publication has won legions of devoted readers and now boasts a circulation of more than 20,000 throughout Latin America.



Sound for Picture: *Mix* has covered audio post-production for video and film since the early '80s, and this coverage increased as more and more studios began turning to the screen for their livelihood. Launched in 1994 as a bi-annual supplement, *Sound for Picture* looks at the people, projects and products on the cutting edge of audio for visual media.

Mix Master Directory: Founded as a directory of studios, *Mix* devoted dozens of pages each month to listings of facilities and services. In 1988, the first attempt was made to collect all this information in one publication, and the *Mix Master Directory* was born. In 1994, the listings were removed from *Mix* altogether, and today the *MMD* carries on as a resource guide for the industry.



Mix Bookshelf: Begun in 1982 as a single page in *Mix* offering a modest selection of books on recording and sound, *Mix Bookshelf* has grown to become the largest mail-order business in the world specializing in information resources for music professionals. If you can't find a book on audio or music production in the Bookshelf catalog, it may not exist.



The more things change, the more they stay the same.

During the last 20 years, *MIX* magazine has proven that it knows the audio business. Yamaha congratulates *MIX* on its consistent quality and service

to the industry and to individual readers. Like *MIX*, over the decades Yamaha has served the audio community by consistently producing a superior

line of analog and digital audio equipment for all segments of the industry. *MIX* readers can always count on Yamaha to deliver the goods.



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Introducing our new family of cross-platform PCI-based multitrack audio recording systems, designed by digital audio gurus and Event's strategic partner, echo Corporation. Our proudest offering: **Layla by echo™**, a rack-mount audio interface with eight balanced analog inputs, ten balanced analog outputs (ins and outs are all simultaneously accessible), digital I/O, a 24-bit signal path, massive on-board DSP, word clock (for sync and expansion), MIDI, and much, much more—all for an amazingly low \$999.

Or meet **Gina by echo™**: two analog inputs and eight analog outputs (all 20-bit, of course), digital I/O, and on-board 24-bit DSP. Appreciate clean design? So do we.

That's why all of the audio connections on *Gina* are pro-quality 1/4" jacks mounted in a rugged breakout box. Appreciate reasonable pricing? *Gina*'s \$499 tag is sure to make you smile.

If you only need two analog inputs and eight analog outputs (again, all 20-bit!), on-board DSP, and a breakout box loaded with RCA audio connectors, then say hello to **Darla by echo™**—priced to fit just about anyone's budget at only \$349. (No, that's not a misprint.)

All three systems are compatible with audio recording and editing software applications that "talk to" the Microsoft Windows 95 .WAV device driver—which means you

don't have to give up your favorite software in order to take advantage of the fantastic sound quality that Layla, Gina, and Darla offer. You can, for example (with full apologies to all of the fine software programs we're unintentionally leaving out), run Cakewalk Software's Cakewalk Pro Audio™. Or Steinberg's Cubase Audio™ and WaveLab™. Or Emagic's Logic Audio™. Or Innovative Quality Software's SAW Plus™. Or Sonic Foundry's Sound Forge™. Or Syntrillium Software's Cool Edit Pro™. (In fact, a custom version of Cool Edit Pro comes with each Layla, Gina, and Darla system, so you can be up and running even if you don't already own multitrack recording

software.) Plug-ins? You bet. Including perennial favorites from Waves and Arboretum Systems.

And since getting up and running is half the battle (a battle we firmly believe you shouldn't have to fight) all three systems are true Plug and Play™ compliant. We even give you a utilities disk that examines your system before installation, so you know exactly what performance you'll be able to achieve.

Don't worry. We haven't forgotten our Mac-based friends. Our PowerPC-compatible systems (same hardware, new drivers) are coming this summer. Prepare to be stunned.

Precision Monitoring Systems

Building on the technological innovations that arose from the 20/20bas development, our intrepid engineers, messieurs Kelly and Dick, set out to create an active monitoring system that would be a perfect complement to the digital audio workstation environment. Requirements: small footprint, reference-quality frequency response, non-fatiguing to the ears over long periods of use, magnetically shielded, and *way* cool looks (!). The result: the **Tria™**

Triamplified Workstation Monitoring System. This integrated three-piece system comprises a floor-mounted VLF (Very Low Frequency) driver housed in a cabinet that is also home to five separate power amplifiers, active crossovers, and a full set of calibrated trim and level controls, plus

RØDE™ NT1 Large Diaphragm Condenser Microphone

Hot on the heels of the awesomely successful NT2 comes the NT1, a true large diaphragm condenser microphone. Like its predecessor, the NT1 boasts low-noise transformerless FET circuitry, and features the highest quality components. With a 1" gold-sputtered diaphragm inside a proprietary shock-mounting system, a unique head design that provides both durability and pop filtering (while remaining acoustically transparent), and a wide dynamic range that makes the mic ideal for use in a wide variety of applications, the NT1 is destined to become a fixture in the modern project and professional studio. And at only \$499, it's just plain scary.

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two biamplified satellite speakers, each with a 5-1/4" poly-propylene driver and 1" neodymium soft dome high frequency driver.

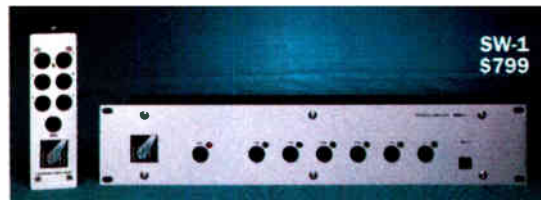
What's truly remarkable is that the biamplified satellite speakers reproduce frequencies down to an incredible 55Hz, so the listener experiences full-range sound when positioned in the near field environment (that is, sitting in front of a computer screen). With the addition of the VLF, the system response reaches down to 35Hz, resulting in

full bandwidth audio reproduction that is as accurate, precise, and pleasing to the ear as our award-winning 20/20bas system. You simply must hear **Tria** to believe it. Even then, you may not believe the price: \$849. (Yes, that's for the *entire* system.)

The 20/20p™ is a direct field monitor designed to provide an affordable pathway into the world of powered speakers. Utilizing the proven 20/20 design, the system comprises a 20/20 cabinet with two full-range 100 watt power amplifiers—one of the amps drives the powered cabinet, the other

drives a passive 20/20 satellite. The resulting sonic clarity is exactly what you'd expect from a system bearing the 20/20 name: extended low frequency response, exceptionally clear midrange, and sparkling high end. What does this kind of audio quality cost? A low, low \$599 per pair.

As with all of our active monitoring systems, the **Tria** and 20/20p offer continuously variable high and low frequency trim controls, input gain controls, balanced inputs with combination 1/4"/XLR connectors, and full magnetic shielding.



SW-1
\$799

SW-1 Speaker Switcher

But you were almost going to pass over this part. After all, a speaker switcher isn't exactly the most exciting product in the world. But the **SW-1™ Speaker Switcher** delivers breakthrough performance and functionality, thanks to the clever engineering of Peter Madnick, who has long been a fixture in high-end audio equipment design. (He's actually pretty scary, possessing serious chops in both the analog and digital domains.)

What makes the **SW-1** unique among switchers is

its ability to simultaneously handle both active and passive monitoring systems. Of the six pairs of speakers that can be connected, up to three sets can be active. Switching among them is as easy as pressing a front-panel button. Or use the included remote control so you never have to leave the sweet spot when switching. Naturally, the audio path is beautifully transparent and the switching noiseless. There is one thing about the **SW-1** that we haven't quite figured out: If you own a pair of Event monitors, why would you have any other speakers that you needed to switch to?



TRIA VLF BACK PANEL



TRIA
SYSTEM
\$849



20/20p BACK PANEL



20/20p SYSTEM \$599



NT1 \$499



EMP-1
\$299

EMP-1 Microphone Preamplifier

What better to complement a RØDE Classic, NT2, or NT1, than a custom microphone preamp that combines superior sonic performance with the features demanded by today's studio professionals? (Okay, we admit the thing sounds pretty amazing with other brands of mics as well.) First off, you should know that the **EMP-1™ Microphone Preamplifier** was designed

by engineering wizard Peter Madnick. Why is that important? Because, in Peter's own inimitable words, it means that the unit features a transformerless design utilizing a common-mode choke input *[translation: RF interference is virtually eliminated]*, a superior differential input *[translation: EM interference is suppressed]*, and servo-controlled DC to maintain

zero DC offset *[translation: There are no distortion-inducing capacitors]*. Ahem. Thank you for those fascinating explanations, Peter.

Put in terms the rest of might have a chance relating to: The **EMP-1** offers ultra low noise operation, selectable phase, low cut filtering, phantom power,

a line output (for running directly into *Layla*, perhaps?), and an internal power supply—all in a downright sexy little box. Now, what does all that mean? It means that the **EMP-1** is a mic pre worthy of your finest microphones. (Don't let its low \$299 price tag fool you. This preamp is the real thing.)



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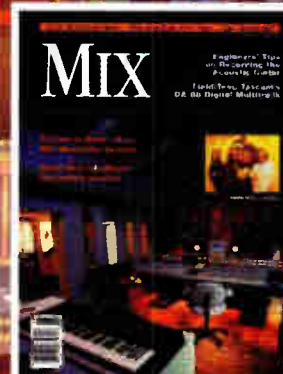
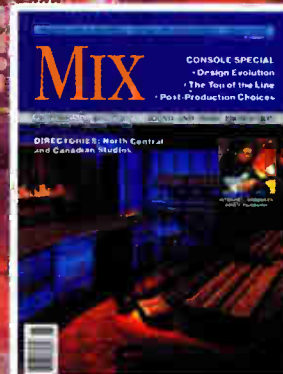
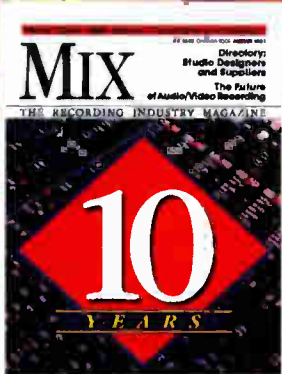
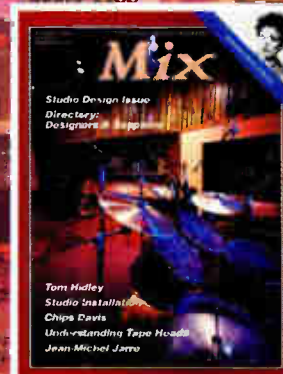
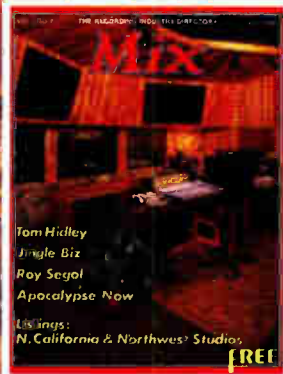
Specifications and features are subject to change.

20 YEARS

COMPILED BY
Tom Kenny

When we sat down to go page by page through 200-plus issues of *Mix*, we had no idea what we were getting into. What started as a directories-based, relatively dry technical magazine turned into a lively, personality-based journal in a very short time. As much as we all turn to the new product announcements for news on the latest digital widgets, it's still people who drive this industry, from the top and the bottom. And for a magazine by and for the "people behind the scenes," it turns out that many of you are eminently quotable. So here is a sampling of 20 years of *Mix*, with a few predictions gone awry and a few thinkers ahead of their time. The quotes, by necessity, have been taken out of context, but the song remains the same. Enjoy.

from the pages of
Mix

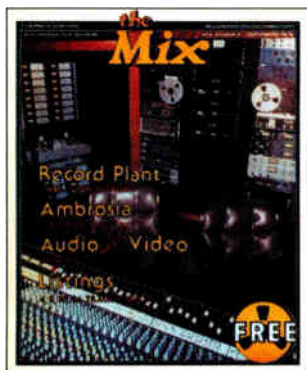




1977

The First Article: With a little planning and some attention to certain details once inside the studio, a 4-track session can be as productive and creative as a session in any larger, more fully equipped studio, and a lot cheaper!...The best way to determine if it's the right place to go is by paying the engineer—who is usually also the owner—a visit. Often, a lesser equipped studio can yield a better product when the environment and engineer are mellow than the flashy studio where the engineer is a jerk!

—John Altmann and Steve O'Hara,
"Making the Most of Four-Track,"
Sept. 1977



1978

Hello, Digital! I expect to see a lot of changes in studios in the upcoming years. I expect to see an increased use of automation. I would like to see recording consoles have the ability to automate the EQ, the echo sends and echo returns as well as other effects and to basically be able to re-create everything that went down in a previous session...I also expect to see digital recorders on the market very soon. There are some machines on the market today that are remarkably quiet. As soon as the major manufacturers are able to put a digital recorder on the market for a competitive price, mag-

netic recording will quickly become obsolete.

—Skip Saylor, "Independent Engineers Forum," Sept. 1978

Small-Town L.A.: Everybody's always talked about L.A. being overbuilt since 1961, and when Wally Heider walked out of Western and said he was going to build two rooms of his own, people thought the world was coming to an end. And then there was the other spate when Sound Labs started up in '70 and Larrabee sprung up and Village came on somewhere in the late '60s or early '70s, and suddenly it went from about 12 rooms to now about 40 rooms that people would say are "A" rooms. I would like to think that there are about ten rooms that are "A" rooms, or maybe 40 "A" and "B" rooms; and then about a hundred more.

—Tom Hidley, Dec. 1978



1979

Up Close and Personal: One of the ways of overcoming the problems and confusing effects caused by early reflection enhancement is to use the technique of Near Field Monitoring. The monitors are placed approximately 3 feet from the listener and about 3 feet apart. This usually means right in back of a mixing desk or up over the meters. In some cases, the monitors may be suspended over part of the console desk, if it is a large one. The concept is not new, but the problem has been a lack of a suitable monitor.

—Ed Long, "Innovations: Near Field Monitoring," Jan. 1979

Our First Letter!: Dear Mix, In regard to the January '79 "Brain Tickling" article (Vol. 3, No. 1), there is just one more point which I would like to make. One of the charges leveled against Aphex has been that it is a "black box." Indeed, until recently, the Exciter circuits themselves were en-

cased in steel and epoxy. That procedure came from the desire to protect ourselves from imitators until our patent protection was complete. That situation has been resolved, and patent issuance is imminent. Under that legal protection, we have opened the circuitry for inspection and invite questions about any aspect of the Aphex theory and circuitry. The Aphex Aural Exciter is not a black box.

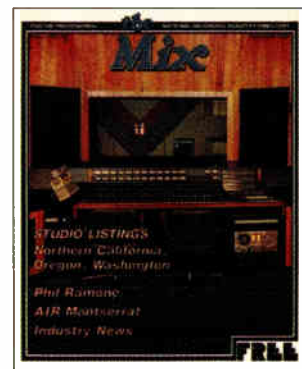
—Marvin Caesar, President, Aphex Systems Ltd., "Feedback," March 1979

Don't Look Back: I think quad was a difficult time for all of us because it was really put on us by the hardware manufacturers, and it got to the point where it just died a natural death. I think it's still a marvelous medium to be used in a natural ambient manner, though. I made many albums that way. In fact, there was one album, Neil Diamond's *Jonathon Livingston Seagull*, where we actually recorded the thing on the Burbank stage with ambient microphones, and it was wonderful. It created a real "stretch" in the orchestra.

—Armin Steiner, "Armin Steiner: Mixing Business With Pleasure,"
by David Schwartz, March 1979

The Way It Was: Rather than "overdub city," we're working with more basic, live kinds of sounds. I think analog is still going to be with us for a good number of years. Analog has reached a very high degree of proficiency, and to abandon that kind of system, within the next ten years, I really don't think is going to happen.

—Glen Snoddy, "Nashville Sounds of the '80s," by David Schwartz,
Dec. 1979



1980

Change USA: My feeling is that anything that you do in a recording studio today...you have to be willing to

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change it in three years...totally change it. Otherwise, you shouldn't be in the business.

—Guy Costa, "Hitsville USA: Guy Costa and Motown Studios," by David Goggin, Feb. 1980

Goin' Home: Today many of us are very concerned about the status of the record industry. Record companies are cutting back on their spending and affecting not only the recording artists, but mixing engineers, independent recording studios, professional recording equipment manufacturers, equipment suppliers, etc...as well. One area that will be the least likely hit and will continue to grow by leaps and bounds is the home recording industry. Individuals who desire to record their own music with economy recording equipment will continue to hock their houses, cars, etc., to purchase equipment to use in their living rooms, basements and/or garage-type studios.

—Larry Blakely, "Progressions: Changing Times and New Directions," March 1980

No Lies: A control room must not lie, misrepresent or deceive you. It must be an honest reflection of what is going on on the other side of the glass...It would be nice to think that rooms could be built without electronic equalization, but we've found that even the finest monitor systems will alter their characteristics over time, depending on temperature, humidity and even the power that they handle.

—Tom Hidley, "Tom Hidley: World-Class Studio Designer," by David Schwartz, July 1980

We Got Time: Some people seem to think that every time something new appears, like automation, for instance, the primary value is in saving time. Well, it's true, certainly, that an automated board can save a lot of mixing time. But due to human nature, what invariably happens is that you discover new things that were impossible or inconceivable before and you wind up working more hours than without the technology. That kind of attitude was very prevalent among those of us working on the picture. It's one of the reasons it took so long to finish, but it's also one of the reasons it turned out so well.

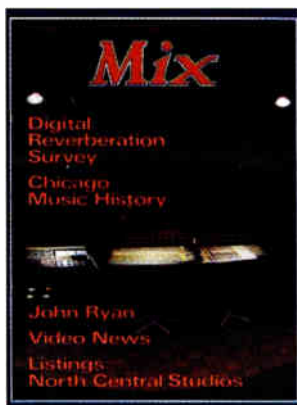
—David Rubinson, "Apocalypse Now: Oscar-Winning Sound," by Tom Donald, July 1980

Sun Shines: "Actually, the board Sam used was a radio board that had been modified to do what it was supposed to do in a recording studio," says Stan Kesler, who played bass and steel guitar on many sessions at Sun. "It had six inputs. He used five microphones, and he had to use one input for the echo return on the slap back tape machine. The echo was done mechanically and electronically. You feed a signal into a tape machine that is on playback. As it records, the separation of the heads is what gives you the delay. It records here and plays back here," Kesler illustrates with his hands, "which is a 2- or 3-inch difference. Then you bring it back through the board and mix it with the regular signal and you've got the echo."

—Rose Clayton, "Sam Phillips: A Place in the Sun," Aug. 1980

Remember "Digital Audio Discs"?: In the past few months, there has been a lot of talk about the various proposed systems for digital audio discs. As it stands, it looks like the first digital audio disc players will be special "audio only" discs made for the Philips videodisc system. There will either be a "PCM" adaptor to connect to the videodisc player or the new videodisc player will include a built-in PCM audiodisc capability. In either case, this will add \$500 to \$1,000 to the price of the videodisc system. According to JVC and Panasonic, these systems are slated to reach the market in the last quarter of 1981. These particular digital audiodiscs will look the same as the videodisc and be approximately 10 inches in diameter. They will provide two hours of stereo or one hour of 4-channel sound per side.

—Larry Blakeley, "Progressions: Digital Audio Discs," Sept. 1980



1981

What We Do: What I try to do is make a record that is true to the artist. If he's a young artist just starting out, he's brought into a very foreign environment. A recording studio is really the most bizarre foreign environment in music. It's very cold, very technical, and all these things seem to take precedence over his music. Suddenly, there he is, facing an aluminum stand with a microphone hanging in front of his face, he's totally sealed off from the world by a set of headphones—I don't know how in the hell they do it! God, what a situation!

—Norbert Putnam, "Norbert Putnam: Bringing It All Back Home," by Sam Borgerson, Feb. 1981

Bravo for Stereo: Most television-industry professionals when asked about stereo television sound will reply that it's coming...but a long way off. Some doomsayers say that it won't work at all...something about a 6-foot audio spread and a 19-inch picture, and where do you put the speakers, and do we pan the hoofbeats left to right with picture, and so on. Surprise, folks, on December 8, 1980, a premium entertainment network called Bravo (similar to Showtime and HBO) went on the air in full stereo. The marketing concept of one-upsmanship on the competition was the inspiration to action.

—Ken Fay, "And Now...Stereo Television," Feb. 1981

Mullin on Tape: The most unforgettable moment in my life was the one when I stood before my Magnetophon tape recorder and pressed the Playback button for the first time in the presence of Bing Crosby, John Scott Trotter and Bing's producers, Bill Morrow and Murdo McKenzie. Everything was at stake. By invitation, I had been present with my colleague Bill Palmer to record the first radio show of the 1947-48 season in the ABC studio complex in Hollywood. And now we were to hear the result of our efforts and to be judged by perhaps the most critical ears in the world of radio and recording.

—John T. Mullin, "The Start of Something Big: The History of the Tape Recorder," March 1981

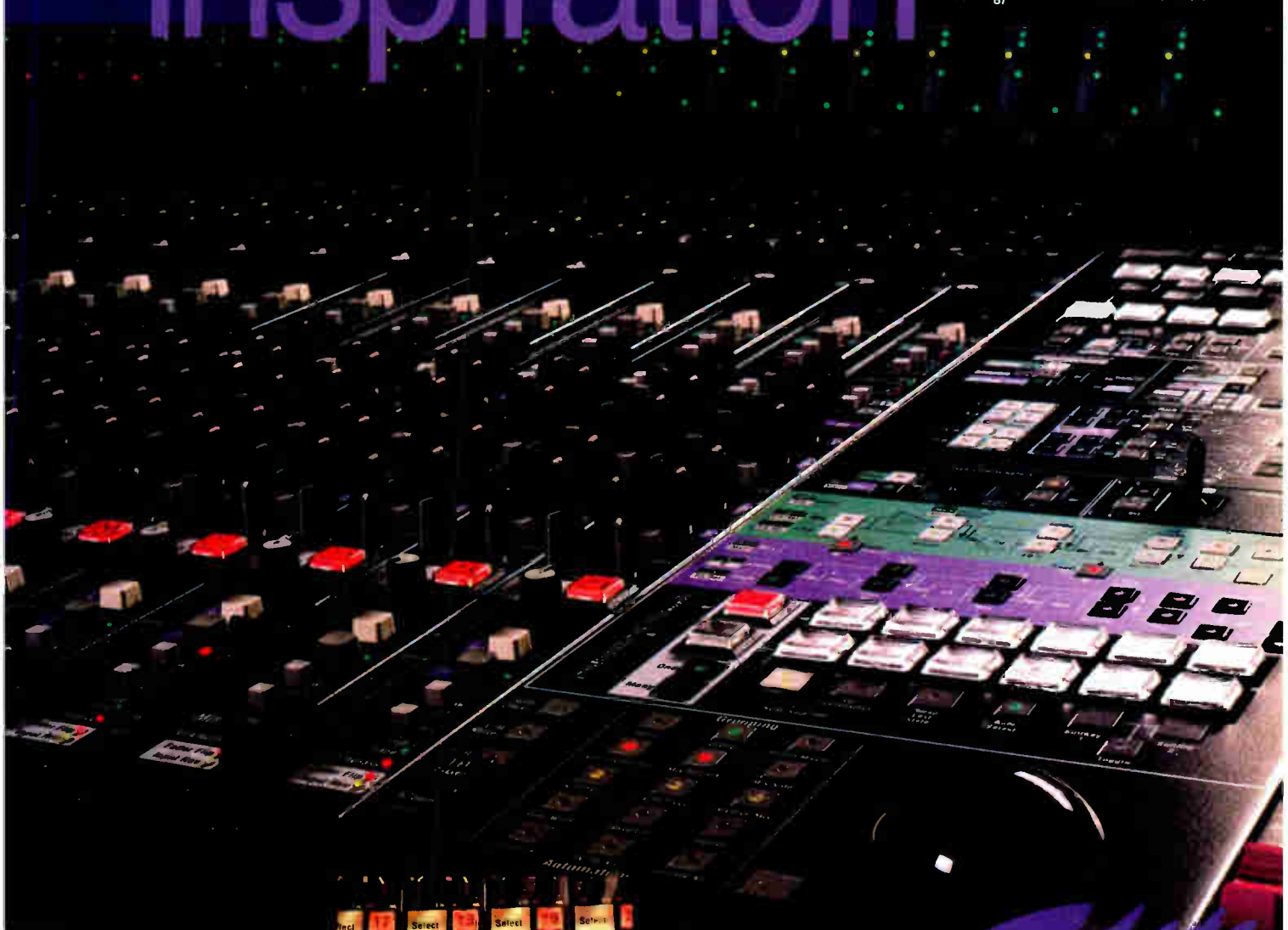
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various systems. Depending on the system, programs are available that can do anything from write letters, bill credit customers or analyze studio expenses—to being able to let your employees or clients play sophisticated video games.

—Dennis Buss and Chris Haselet,
"Studioscope: Small Business Computers," May 1981

Can You Say, Project Studio?: You should have heard the remarks when TEAC first came to exhibit at the AES (Audio Engineering Society) convention. "You can't be serious! What part do they have in a professional recording equipment show!" At each subsequent show, the manufacturers of low-cost recording equipment increased. After a few short years, the industry seemed to be divided into "Pro" and "Semi-Pro."

—Larry Blakeley, *"Progressions: Multitrack for the Masses,"* July 1981

Sweep It up 3dB: There's no such thing as a producer's school. There are some engineering schools, but all the good engineers I've met have had hands-on experience. They start out sweeping floors and somehow work their way into getting the job. Even if you went to an engineering school, you would probably still have to sweep. But you'd be a better sweeper because you'd know what you were sweeping around.

—Brian Abern, *"Producer's Desk: Brian Abern,"* by James Riordan, Sept. 1981

If Only It Were That Simple: In editing there is one rule to remember! Always cut copies, never cut original materials unless, of course, it is your own and you take full responsibility for your action. The following is a list of items which you will need to do a proper job with as little mental anguish as possible:

The best metal splicing block money can buy (plastic is for the birds), a package of single-edge razor blades, a roll of white splicing tape, a thin-lined alcohol marker (the kind that is permanent, not the water-color variety that smudges and smears), a good desk lamp with a goose-neck or spring-tension arms, a flashlight, scissors, a bunch of white cotton film editor's gloves (available at all professional motion picture supply houses and many photo stores and cost around \$5.00 per dozen), a roll of recording tape you can

play around with and ruin, headphones, a recorder/reproducer with mic, a degausser, absolute quiet.

—Earl R. Dingman, *"The Fine Art of Tape Editing,"* Sept. 1981



1982

LEDE, All the Rage: When LEDE acoustic design is coupled to an optimized phase-coherent electronics system, tapes translate exactly from the control room to any playback system...What you hear in our LEDE control rooms is a very close approximation of the actual information on the tape. What you hear is what you get without having to make subjective projections of how it will sound elsewhere. This is accomplished through design, not outboard equalization, traps or gimmicks.

—Chips Davis, *"LEDE Comes of Age,"* July 1982

Don't Forget! I like to spend money on maintenance. Many studio managers, particularly accountants or absentee studio owners or whatever, feel that maintenance is a drag because you can't write up a work order for maintenance and charge the client for it. Maintenance is something you've got to eat.

—Wally Heider, *"Multitrack Revolution,"* by Larry Blakeley and George Petersen, Aug. 1982

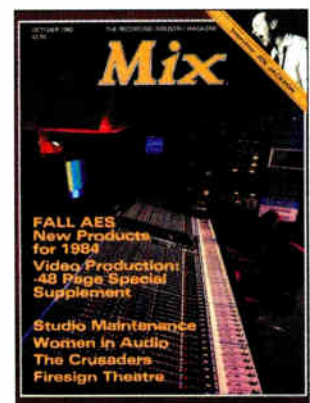
First Pohlmann: Perhaps in the future we will return to a simpler concept in which a studio once again contains only a few and maybe only one piece of equipment. And as you might imagine, it will be digital equipment. The simple fact is digital devices can be operated faster and easier because of their inherently computer-aided nature. To be maximally cost-effective, we would expect a recording studio of the future to be wholly computerized. That

one piece of equipment—that monolith—will be the studio computer.

—Ken Pohlmann, *"Visions of the Future: Brave New Studio,"* Aug. 1982

Time to Retune: What I've heard on digital tape recordings I don't like because I hear a high-frequency hash (about 12 kHz and up). I think that digital audio disks are going to happen, and mixers are going to have to get their technical chops together. They just can't indiscriminately use microphones in a haphazard manner anymore. The quality is going to have to come back. With digital, you have the capability of doing full dynamic range recordings, and you have a whole industry that doesn't know how to do this.

—Bill Porter, *"Bill Porter, Part 2"* by Larry Blakeley, Sept. 1982



1983

First Product Review (and first Craig Anderton): Programmable drum units with digitally recorded drum sounds have been around for a while; however, their expense (typically \$2,500 to \$3,000) has—until now—limited their availability to all but the most affluent studios and groups. That situation is certain to change with E-mu's introduction of the Drumulator, a digital drum unit that holds its own against the competition but, thanks to extremely efficient use of computer technology, lists for under \$1,000.

—Craig Anderton, *"The Beat of a Different Drummer: E-mu's Drumulator,"* June 1983

What's This MIDI Thang?: Sequential Circuits' Prophet 600 and Roland's JP-6 are the first instruments to enter the market equipped with a new Musical Instrument Digital Interface (MIDI), an important new development in the electronic music industry. MIDI-

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equipped instruments can be connected with a single cable and work together as a unit, and many such devices can be operated synchronically—and MIDI promises to make home computers a part of more electronic music systems, too.

—*Digital Interface Standard for Instruments*, June 1983

Frank, We Miss You: “Dwarf Nebula” started off as a piano exercise. During the time we were doing *Uncle Meat*, I was working with an engineer [Richard Kunc], who was real cooperative, just trying to do any kind of weird thing we asked him to do. During the ‘60s, who knew what was right? “Let’s try this. Plug it in backward and see what happens.” So we were dealing with different types of short-term distortion, and he built a little box and three push-buttons; we called it the Apostolic Blurch Injector. And we took various tracks of different types of material and cranked them up into the distortion range and then, by poking the buttons, you’d get these little rhythmic bursts of white noise, brown noise, pink noise and gray noise—in a rhythm that you’d select. But instead of being derived from a noise generator on a synthesizer, it was completely distorted voices, instruments, percussion, whatever.

—*Frank Zappa, “Interview With Frank Zappa,”* by Dan Forte, June 1983

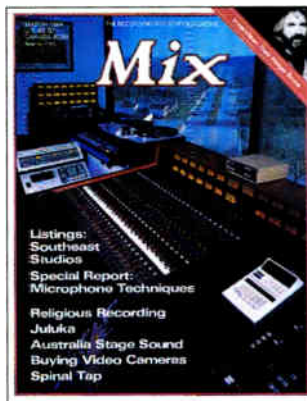
Before He Was King: While recording, Was tries to adhere to what he calls the “science of zengineering.” “The only way to engineer is not to engineer at all,” he declares. “I try to make the process of taping as invisible as possible, and to do that I make some sacrifices. Occasionally, I don’t watch the levels, and if you turn the sound off you can hear the meters pegging in tempo.”

—*Susan Borey, “Music Notes: Was (Not Was)—Zengineering Explained,”* July 1983

Miking Michael: Bruce Swedien comes here to do things like the Michael Jackson/E.T. album. For that, he brought a 60-piece orchestra in here and did the whole thing live with Michael. Bruce uses a Shure SM-7 on Michael’s vocals...Michael has a fairly soft voice and needs something I like to call the “dynamic urgency,” which is something you get from dynamic mics that you just can’t seem to get

from condenser mics. You can get this presence with this mic.

—*Allen Sides, “Ocean Way’s Allen Sides: Vocal Miking Specialist,”* by Mick Thompson and Bill Friday, Nov. 1983



1984

More Inputs!: When the number of inputs reached 64—and kept on going up—people started to wonder whether the Grateful Dead’s recording session at Fantasy Studio D in Berkeley was some kind of record-breaker. The Dead had to bring in a 10-channel Neve mixer to augment Fantasy’s 56-input console, and engineer Phil Kaf-fel notes that several mics have been set up but won’t be plugged in until they’re needed as the sessions progress. So the question is, does anybody know of another recording session that used so many microphones and mixer channels?

—*David Gans, “Music Notes: Query to Engineers,”* April 1984

The Great Pretender: If I want to play guitar, then I will. It’s simple. I’m not “working in a man’s field”—I’m just doing what I like to do. I think that’s discrimination, talking about roles. If I wanted to get a band together, and I said, “female guitar player wanted,” I might as well say, “Jewish guitar player wanted” or “black guitar player wanted.” That’s got nothing to do with music, to me. It’s just discrimination, and I’m not even going to discriminate between different kinds of discrimination, which all that “role model” kinds of thing implies.

—*Chrissie Hynde, June 1984*

He’s the Boss: What happens with Bruce is different from most of the people I work with. I’ll pretty much go for it sounding like a record, and then they’ll come in and pull it apart be-

cause it usually sounds too slick to them. Bruce doesn’t want to sound like “a record”—he wants it to sound like a bunch of people just playing instruments onstage, or wherever.

—*Bob Clearmountain, “On Mixing for the Boss,”* by David Gans, July 1984

CD Beware: The problem is, on some CD recordings, the recording is a little too real. I hear full-fidelity music and other full-fidelity sounds such as air conditioners, noise ventilators, street traffic and poorly designed acoustics. The sound on a CD can be as smooth as a baby’s bottom, and about as naked. Extraneous acoustic junk which otherwise becomes lost in the analog replication chain is now unashamedly present in the consumer’s living room. The CD will clearly require a re-thinking on the part of the audio engineers, as to technique.

—*Ken Pohlmann, “Audio Applications: Digital-Quality Acoustics,”* Aug. 1984

They Tried: At a May press conference in New York, a little David named CompuSonics announced its intention to take on the Goliaths behind the Compact Disc.

—*Neil Weinstock, “Digital Discussions: CompuSonics, Another Digital Audio Standard,”* Aug. 1984

An Argument With Legs: I still feel that a well-made disk is sonically superior to the same product on CD. It’s interesting that digital technology is the most controversial thing in the industry. You could line up ten engineers and five would love it and the other five would say it’s terrible.

—*Doug Sax, “Holding the Line Against the CD,”* Dec. 1984

Off by a Few Years: We expect that in 1990, the worldwide sales volume of both CD and LP will be around 550 million disks each, and within five years after that, the LP will largely disappear.

—*Emile Petrone, “Interview With Emile Petrone, Chairman of the Compact Disc Group,”* by Ken Pohlmann, Dec. 1984

1985

So Fast: By the time you read this, it will probably be obsolete. As the ad says, digital audio is transforming us all.

—*Ken Pohlmann, July 1985*

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In addition to being a sound designer for the Hollywood Bowl Joseph Magee records and mixes for film, and in 1995 received a Grammy nomination as a producer/engineer.

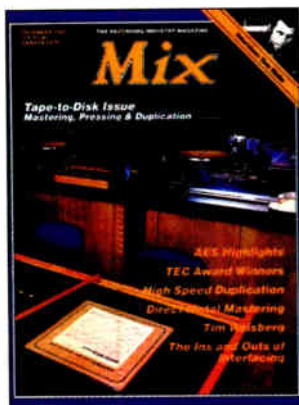


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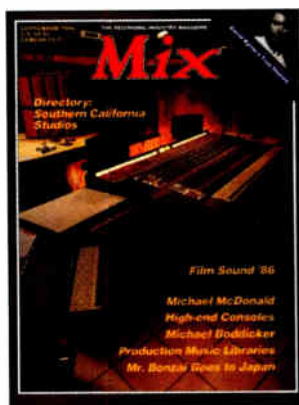
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Hello, Audio Post: A studio was either a recording studio with a video machine hooked up, or else the other way around: a video facility with audio machines plugged in. It always looked so makeshift, with a television sitting on top of some rack they wheeled in. My concern is how functional things are, and something that temporary can't be functional.

—Ken Hahn, "Sync Sound Teaches Machines to March," by Dan Daley, Nov. 1985



1986

Before She Was Our L.A. Editor:

You have to be careful to not kill creativity with efficiency and rigidity, and usually record companies are pretty supportive and understanding...Of course, for lower-budget projects, you have to just hurry up as best you can. There can actually be a real excitement to doing things quickly. An adrenaline gets going that can spark creativity and spontaneity.

—Maureen Droney, "Money Makes the Records Go Round: Producers & Engineers Talk Budgets," by Linda Johnson and Blair Jackson, Feb. 1986

The Time Is Now: I realize I talk about computers a lot in this column, so my apologies if you're up to here with the latest news about who has

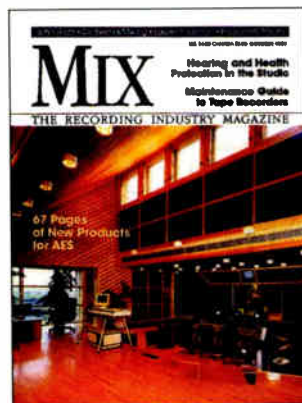
what software and what updates are planned. But the concept of computers being the "wave of the future" in music is no hype: I'd have to go back to the multitrack tape recorder to think of a more universally applicable musical device. If you don't have a computer now, you surely will before too long.

—Craig Anderton, "M.I. Update: As the Disk Turns," March 1986

Bravest of the Brave: No, I *never* get an idea and then try to force equipment to do it—that doesn't work. I go the opposite way: I turn everything on in my house all at once and try to respect what each piece of equipment can do and let it teach me what I can get out of it. Those are my instruments, more than violin or keyboards or a pencil. Those are my tools. I need to know really well how to use them.

In shooting [Home of the Brave], I was not as familiar with the tools. You not only have sound, lights, projection, electronics—you have cameras, SMPTE, an entire interface system. So when you say, "action" on that set, 500 machines are going *BV1111VWOHH!* It's incredible. You can feel it in your feet coming through the floor.

—Laurie Anderson, "Laurie Anderson Gets the Movie Bug," by David Gans and Bonnie Simmons, Aug. 1986



1987

Well, It Sounded Good: On June 29, 1986—what has become known in the European audio industry as "Black Sunday"—one of Britain's most prestigious newspapers ran a story that sent shock waves through the record and electronics industries in Europe. "Compact discs are about to be made obsolete by a new generation of audio cassette dubbed digital audio tape," ran the opening line of a featured article in Rupert Murdoch's newspaper, the *Sunday Times*. "DAT," it continued,

"will give quality far superior even to that of compact disc."

—Barry Fox, "The Great DAT Scare," Feb. 1987

Mono, Dammit!: The main objection I had was that they were going to release those awful, so-called "stereo" mixes which have been the bane of my life for the past 20 years and more, and which have perpetuated this kind of myth that I recorded all their early records in stereo. The truth is that all those first recordings were done in mono. They were *not* stereo, and were never intended to be stereo mixes.

—George Martin to Iain Blair, "The Beatles on CD: An Interview With George Martin," May 1987

Wagner's Not U2: Rather than spot-miking, it's more fun to move the players around—not major redistribution, but moving them back and forward as required. I always make slight modifications for the music: If it's a Wagner program, I will set the orchestra differently than a program of modern music. I would want a deeper seating with the Wagner program; because of the weight of the brass, I would put them back a bit to get a better balance between the brass and strings.

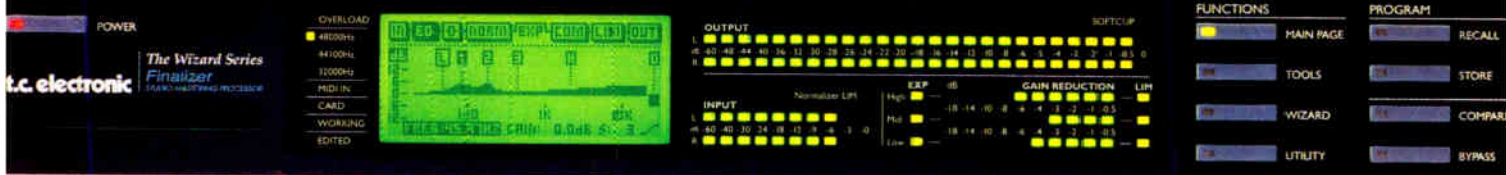
—John Eargle, "Orchestral Miking: Two Views," by George Petersen, Oct. 1987



1988

Here It Comes!: Attention studio owners: While you were busy booking sessions, trying to make the monthly payments so the bank doesn't repossess your new console (an exciting new concept in banking: a full-service bank with cash machine, drive-up window and a 64-input SSL), the requirements for a world-class studio just changed again. Now, unless you have several CRTs, personal computers, hard (or

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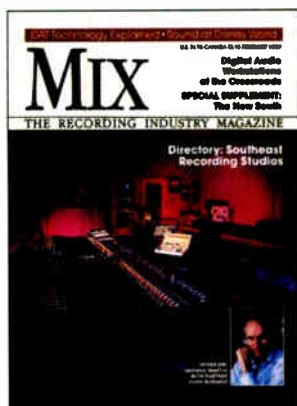
CIRCLE AD NUMBER ON PRODUCT INFO CARD

optical) disk drives, and a workstation, you just aren't happening.

—Ken Pohlmann, *"Insider Audio: The Workstation Cometh,"* Feb. 1988

He Warned You: Since this is my first column in this magazine, I will do something that I have not done in over 20 years (and that was in front of my school principal). I am about to voluntarily explain myself. I am not really a writer. I am only a guy who writes, and I am the guy who writes this column. I try to write about the truth. This may be the truth as I see it, or as I think it will be. In this column, I talk occasionally about the past, sometimes about the present, but usually about the future.

—Stephen St.Croix, *"The Fast Lane: Openers,"* March 1988



1989

Never, Never, Never: In a way, it may be that many of us have been simply seduced by technology. We've been led subtly to believe that a synthesizer has the power and detail—the lace and filigree—of a large orchestra, a group of talented musicians playing together. That's not true now, and it won't be even in the future. The detail of a big room filled with musicians working together and feeding off each other, both mentally and harmonically—however foolishly romantic it might sound—will never be replaced by machinery, no matter how sophisticated it may get.

—George Massenburg, *"Lace and Filigree: The Search for Transparency and Detail,"* Sept. 1989

Home Studio Battleground: In June, the Los Angeles City Department of Building and Safety ordered the closure of producer/songwriter Chas Sanford's home studio, Secret Sound L.A., claiming the business violated residential

zoning laws. This occurred not long after a meeting was held by a new, informal organization of about 40 major recording facilities, the Hollywood Association of Recording Professionals (HARP). HARP formed because studio folks wanted to talk about common business issues, like insurance and bill collection. When HARP members saw a brochure about Sanford's studio, they began to wonder about zoning laws.

—*"When Is a Home Studio Not a Home Studio?"* by Linda Jacobson, Tom Kenny and Randy Alberts, Sept. 1989



1990

Long Before EQ: The so-called upper-echelon home recording formats—and even a number of smaller but more elaborate rooms with 24-track equipment—are making a comeback on the commercial scene, and in so doing are changing the complexion of the recording industry marketplace, affecting a balance of power that was once ruled by budgets the size of Tiananmen Square. They are becoming, for lack of a better term, "project studios," facilities whose existence is based on a core of a few clients working within a single layer or two of the industry.

—Dan Daley, *"Studio View: Turnstyle Productions,"* Feb. 1990

True Stereo: In January of 1988, I heard stereo for the first time. This may seem like an odd statement coming from an audio engineer with 15 years of experience...That's not as strange a statement as it may seem if you consider what the word "stereo" means. Most people mistakenly think of stereo only in left-right terms and not by its full meaning, which includes depth.

—Barry Diament, *"Mastering Monitoring: Some Thoughts on Stereo,"* June 1990

Audio at MacWorld?: Every time I walked by the Digidesign booth at San Francisco's MacWorld Expo in April, there was a huge crowd on hand checking out the demos there. In this three-day event that had more than its share of remarkable new products, Digidesign's were among the most noteworthy, particularly for *Mix* readers.

—Paul Potyen, *"The Byte Beat: Playing With a Full Deck at Digidesign,"* July 1990

Double Up: Well, as we got more tracks, we did more overdubbing, and I always liked to overdub voices. One of the things I started doing as an engineer was double-tracking voices. You talk about deficiencies in equipment and acoustics—these days you can go in, find all the dead spots and correct them in no time. But that wasn't the case in that era. It was trial and error, and so I discovered that double-tracking the voices let me fill in some of the holes in the sound. I'd also move the singers around the mic to alter the way it sounded in relation to the first track, to fill in the sound. I did that with The Bachelors, with The Kinds, virtually everyone.

—Shel Talmy, *"Producer's Desk: Shel Talmy,"* Oct. 1990



1991

I really think that digital is where it's going. Even dinosaurs like Bruce [Sweden] and I are not going to stop it [laughter].

—Al Schmitt, *"NARAS Roundtable: Modern Recording & Production Techniques,"* Feb. 1991

Nashville or Bust: "The misconception is that people move here because their careers are over in Los Angeles," says Josh Leo, former L.A. session guitarist and now producer and vice



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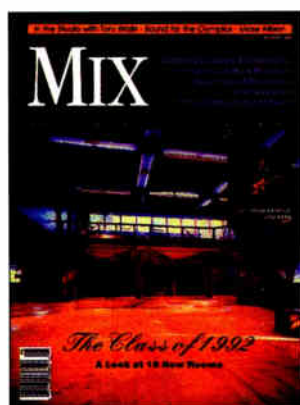
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president of A&R for RCA Records in Nashville. "You'll find that people work harder and longer here than they do in L.A. We all moved here to play music. If we skimmed off the top of all the serious, major musicians and put them in a room, you would find that's most of the people who have moved here."

—Missy Baker, "The L.A.-Nashville Connection," June 1991

First Time Around: No, it doesn't stand for Medical Doctor. It doesn't stand for Mogen David, or even Mad Dog. It stands for MiniDisc.

—Ken Pohlmann, "Insider Audio: MD," Aug. 1991



1992

Where There's a Need: It takes so long to set up and adjust a complex recording board that my first instinct was that there had to be a better way. I went to the AES convention in 1987 and looked at all the console designs. I couldn't believe it: \$500,000 consoles that couldn't even reset! Our group had the ability to handle the technology, so we raised a little bit of money, built a garage-type operation, and went to Los Angeles AES in 1988 with a small prototype. What happened during the AES demos was that all the big studios got very excited at the concept of total, computer-controlled reset.

—Scott Silfvast, "Euphonix: Scott Silfvast on Digitally Controlled Console Design," by Mel Lambert, March 1992

Sometimes We Miss: Digital Compact Cassette was the brightest star in Las Vegas at this year's Winter Consumer Electronics Show.

—Phil De Lancie, "Tape & Disc: Philips Formats in Fore at CES—DCC Models Unveiled in Vegas," April 1992

The Revolution: I'm not sure whether this is a review of a product or a phenomenon, as no device in the recent history of professional audio has created such controversy, speculation and conjecture as the Alesis ADAT. Announced in January 1991, the long-awaited system uses a modular approach to digital multitrack recording, at a price that's comparable to the least expensive pro analog decks available.

—George Petersen, "Field Test: Alesis ADAT," Oct. 1992



1993

Sound On (Off) Stage: When it comes to outdoor concerts, what's a song for audience and engineer can be a headache for the local yokels, depending on how the wind blows. Literally. But the proliferation and variety of sound ordinances leave some pros scratching their heads. When does music become noise? Where do those guys with the little meters come from? What will Johnny Guitar say?

—Maria Conforti, "Noise Regulation Perspectives," Jan. 1993

Don't Give Me Numbers: When they talk about dB, like "Give me +3 dB at such and such a frequency," I don't get along with people like that. I like to hear what they feel and not to tell me how to do it. And now, very few people come to me and talk like that. I guess I'm lucky.

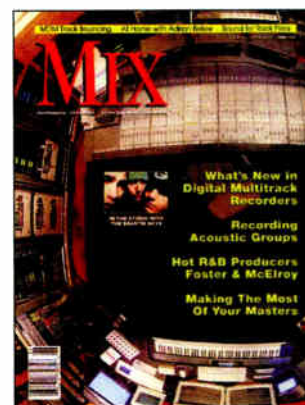
—Rudy Van Gelder, "Rudy Van Gelder: Jazz's Master Engineer," by Jeff Forlenza, Oct. 1993

1994

Bye Bye, Moviola: The beginning of the end (as they say in cheesy horror movies) of mag-film-based sound editing was a modest ad that appeared last summer in an issue of the movie biz

trade paper *Daily Variety*. It announced three "items" for sale: two 60-input re-recording consoles (one with Massenburg automation) and 100 35mm Moviolas. Although the ad had no return address on it, both the console descriptions and the phone number told anyone who cared the name of the Major Studio that was doing the housecleaning. Since we can be pretty sure that they weren't going to be replacing these dozens of (presumably) ancient Moviolas with new, improved Moviolas, strike one more nail in the coffin of sound editing on film.

—Larry Blake, "Sound for Film: One More Digital Nail in the Mag Editing Coffin," Jan. 1994



King George: When I started working at *Mix* in 1981, I never imagined that I'd be taking over this space from the co-founder of the magazine, David Schwartz. Now, having written some 500 articles and a couple of books, I have a pretty good handle on *Mix* readers and what they want to see in the magazine. But who is this Petersen guy anyway?

—George Petersen, "From the Editor: The New Regime," Sept. 1994

Birth of a Classic Column: Originally, I thought I might open Classic Tracks with some heavy Beatles or Stones tune, but a funny thing happened on my way to doing number one: I saw the Disney film *The Lion King* (twice) and re-fell in love with "The Lion Sleeps Tonight," a mere snippet of which is sung by the gruff but lovable warthog Pumbaa and his wise-cracking meerkat buddy Timon in the film. When the original version by The Tokens was re-released this past summer, I bought a copy for my *Lion King*-obsessed 4-year-old son, cranked up the big speakers in my living room and was immediately blown away by

—CONTINUED ON PAGE 97



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House Engineer
Broadway Tour Production
Music of Andrew Lloyd Weber

Andrew Baldwin
System Technician
Tours include
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Kiss*

Richie Agamemnon
System Technician
Ozzy Osbourne Tour

Gary Rizzo
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Digital Mix Technician
Credits include *Mask, Disclosure,
Toy Story, Star Wars Special Edition
The Lost World: Jurassic Park, Contact*

Cordy Rierson
Visual FX Producer
Credits include *Independence Day, Batman
Forever, Broken Arrow,
Clear and Present Danger*

Pete Lehman
Sound Design
Braveheart

Mike Allison
Crew Chief
Kiss - 1996 World Tour

Mike Catarina
System Technician
Alan Jackson Tour

Jake Mann
System Technician
Kiss Tour

Ed Conrad
System Technician
Tours include
*Robert Plant & Jimmy Page, Billy Joel,
Rolling Stones*

Scott Signore
Graphic Designer
101 Dalmations
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Shane Cook
House Engineer
Broadway Tour Production
Rent

Keith McCabe
3D Artist / Animator
*Volcano
Face Off*

Rob Bull
Monitor Engineer
Little Texas

Frank Sgambellone
System Technician
Phil Collins - 1997 World Tour

Greg Handcock
System Technician
Tours include
*Reba McEntire, Rolling Stones,
Soundgarden, Moody Blues*

Shari Rachlin
System Technician
*David Bowie, LL Cool J, Trisha
Yearwood*

Bill Philput
House Engineer
Tours include
*Richard Marx, Barbara
Mandrell, Harry Bellefonte*



Rusty Ippolitto
3D Artist/Animator
Dante's Peak

Rich Flora
Monitor Engineer
Colin Raye

Donny Medaris
Graphic Artist
Metropolis Digital/CA
Developers of:
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Kip Gire
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Engineer/Producer
Dwight Yoakam

Sebastian Kryz
Engineer
Crescent Moon Studios
Gloria Estefan, Arturo Sandoval

Felipe Elgueta
Recording Engineer for
Grammy Award winning Producer David Foster
Credits include *Celine Dion, Whitney Houston, Barbra Streisand, Toni Braxton, All 4 One*

Mike Fossenkemper
Audio Engineer
Credits include *Madonna, Elton John, Color Me Badd, Blues Traveler*

Eric Stolz
Additional Engineer
R.E.M.
New Adventures in Hi Fi

David Dubow
Recording Engineer
Credits include *Bruce Springsteen, Pointer Sisters, Julio Iglesias*



in the mix

Dean Jamison
Engineer/Assistant
to Producer Ed Seay
Martina McBride, Ricochet, Colin Raye

Albert Kadavy
Audio Engineer
For *Ace Ventura CD-ROM*

Mark Hagen
Engineer with Bruce Swedien and Quincy Jones
Credits include *Michael Jackson's Bad, Dangerous, and Thriller*

Derrick Perkins
Co-Producer/Programmer
for Grammy Award winning
Producer/Artist Stevie Wonder
Credits include
Conversation Peace

Chris Fogel
Recording Engineer for
Grammy winning producer Glen Ballard
Alanis Morissette Jagged Little Pill

Graham Lewis
Recording Engineer
Vince Gill
High Lonesome Sound

Carl Verna
Assistant Director
Music Video/Film Production
Toni Braxton, Ginuwine, The O'Jays, The Fugees

Chris Evans
Recording Engineer for
Grammy Award winning single
"Slow Jams" from Quincy Jones' album
Q's Juke Joint

Caram Costanzo
Recording Engineer
Credits include *Stone Temple Pilots, Pearl Jam*

Chris Shepard
Recording Engineer
Smashing Pumpkins
Mellon Collie and the Infinite Sadness

Brian Glazen
Line Producer/Production
Manager
The Fanatics, Soulmates, Bio-Dome

Phil Tan
Additional Engineer
Mariah Carey's #1 single
Always Be My Baby



on a hot set

Steve Cainas
Producers Assistant /Production
Coordinator
U.S. Marshalls, Wild America, The Hudsucker Proxy, The War, Something To Talk About

Steve Switaj
Motion Control Cameraman
Aliens 4, Batman Forever, Apollo13, True Lies, Fifth Element, Interview with a Vampire

Keith Cohen
Recording Engineer/Producer
Credits include *Paula Abdul, Prince, Bobby Brown*

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Props and Location Art Dept.
Rosewood, Gone Fishin'

Michael Korieba
Studio Manager
Soundstage

Rafael & Luis Garcia
Multimedia Graphic Designers
Sites include
Cybertoons, NCR, Northwestern Mutual Life

Joe Cruz
Internet Service Provider/CD-ROM
Producer/Site Developer
for multiple firms based in
the U.S., Asia, Spain, Russia

John-Erik Moseler
Owner
Stage 22
Multimedia Production Facility

Will Edwards
Owner
Ascension Studios

Philip Derobertis
Studio Manager
Westlake Audio

on the web

Dave Dubow
Studio Manager
Signet Sound

Steve Baker
Owner
SB VideoProductions
Videographer/Producer

in charge

Dorrie Batten
Owner
Sounds Creative
Sound Effects Design and
Production

Allon Sams
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Studio Surviv

by David Schwartz

When *Mix* opened its doors 20 years ago, the publication's primary goal was to define the recording industry by the studios and the people who operated them. Massive directories filled each issue, targeting areas of the country and spec'ing out what one might find inside the soundproof chambers of those facilities.

Looking back at those early issues, we became interested in those survivors who were plugging away at their studios then and are still at it today. We wanted to know what has kept them doing what they've been doing all this time. And why? And how?

Of course, the advantage of talking to the "old-timers," as Ardent Recording's John Fry pointed out, is that "they have so many experiences that, if they don't remember exactly how something happened, they're not very bashful about making things up." So we trust that the comments and observations presented here are at least in close proximity to events and situations that actually occurred.

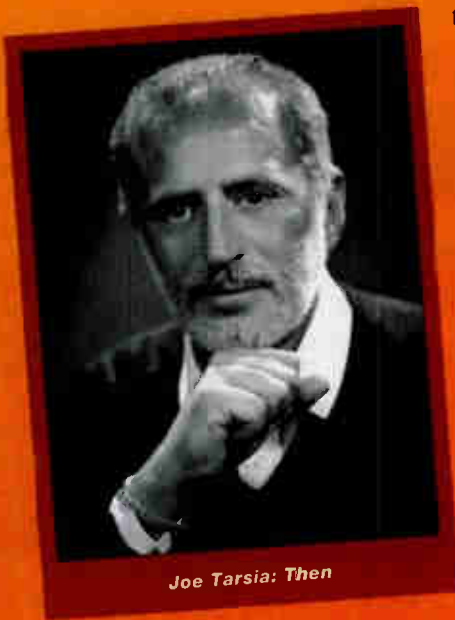
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12

who beat the odds

Philly's Big Cheese: Sigma Studio's Joe Tarsia

Joe Tarsia, the first president of the Society of Professional Recording Services, began working as an electronics service technician in Philadelphia during the late 1950s. Back then, Philly was a hotbed of musical activity, hosting the instantly phenomenal *American Bandstand* TV show, producing an emerging parade of pop stars and forming the beginnings of a seminal rhythm and blues movement.



Joe Tarsia: Then

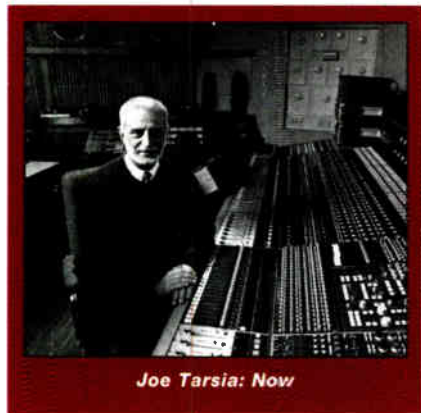
Tarsia scored a job out of college with consumer electronics pioneer Philco, where he worked in the product research division, moonlighting with a small TV service business on the side. His technical prowess soon led to calls for servicing tape recorders at AMS Studios, which did recording work for the *Bandstand* show. After a few years at AMS, and a few more as chief engineer at the Cameo Parkway record label, he came to the realization that to stay in the recording business he would either have to move to L.A., New York or open his own studio.

Tarsia swallowed hard, borrowed \$45,000 from the bank and opened an 8-track room in a space that he shared with the Frankford Wayne mastering facility in August of '68. He called the studio Sigma, a name that came to him while staring down at the place mat in a Greek restaurant.

12

who beat the odds

Sigma was pretty close to an instant success, quickly grabbing the bulk of Philly's pop R&B work, much of which came from the talents of pro-



Joe Tarsia: Now

ducer Thom Bell, and the Kenny Gamble and Leon Huff production team, who were turning out hit after hit of the Philly Sound. By 1980, Tarsia had eight recording rooms going in Philadelphia and a satellite New York City facility, which had opened in 1976. But by the early '80s, many things had begun to change in the recording business.

"About that time, the word 'disco' became a dirty word, and then Thom Bell moved to Seattle, and Gamble and Huff's contract with CBS expired. The biggest adjustment for Sigma in the '80s, though, was coping with the reality of people's ability to do the first- and second-tier developmental work at home on computers.

"Rates really went stagnant in the early '80s and haven't really recovered much from that time. The '80s were a reality time of adjusting to the new world, adjusting to electronic music and to the proliferation of turnkey studios. The turnkey studio gave the opportunity to a lot of people like hobbyists or doctors' sons to get into the studio business. And they became competition, even though they rarely made money.

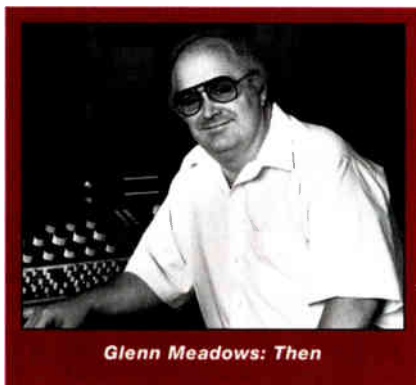
"One unfortunate trend of the '80s," says Tarsia, "was the development of the freelance engineer, because he stood between the producer and the studio. The studio was then forced to supply the technology that particular freelance engineer thought was neces-

sary. It was no longer my decision of what my studio needed.

"What that took away from the independent recording studio was their sound and their style. At one point in time, I could tell you what studio a record came out of by the sound of the record. There were very distinctive characteristics, not only from the facility but from the people who engineered there and who created that sound."

While Sigma started as strictly a music facility catering to the record business, to survive they've diversified into media services, including audio-for-video, radio production and CD/cassette duplication. "One of the things a studio has to do today is be its own customer. In Sigma's case, we are involved in not only selling studio time, but selling productions. We put together the creative people and creative ideas and go to a label or a catalog company in a special market and sell creative packages that we can produce in the studio.

"My advice to young people who want to get into the studio business," says Tarsia, "is not to become a slave to the technology. The technology is changing so fast that you could bet the house and the farm on a console or a 48-track digital storage system and find out before you'd paid for it that it's no longer the right technology."



Glenn Meadows: Then

Nashville Bridges: Glenn Meadows' Masterfonics Makes the Connections

"The toughest thing in this business," says Masterfonics owner Glenn Meadows, "is trying to get the people in the record companies to understand what it costs to provide the level of technology and support that they expect.

We're making an effort to educate these people as to what all this stuff costs and why studio rates need to go up from where they are."

Considered one of the country's most technically progressive studio op-



Glenn Meadows: Now

erators, Meadows got his start in the business working in Atlanta as a freelance maintenance engineer at a studio called Sound Pit. He moved to Nashville in 1975, started working at Masterfonics and now owns the facility.

"Back in the early '80s, we ran into significant financial problems," he recalls. "We were referred to an independent business management consultant who offered to help straighten it out, and working with him basically turned the business around and allowed us to continue to grow. He helped us restructure our debt, and we were actually able to pay our creditors back in half the time we said we would."

Getting studio rates in parity with costs is a goal that Meadows shares with many studio owners, though he agrees today's realities demand diversification of services. "In the mid-'70s, people got \$225 an hour for a 16-track studio that had maybe a total investment of \$80,000 to \$100,000. That compares to today's rates of \$2,500 a day for a room that cost \$2 million to build and equip. This only makes sense when you have other revenue centers that can make it work."

Meadows' efforts are also applied toward expanding the musical palette of Nashville's recording projects. "We would like to be at the leading edge of bringing musical talent to Nashville that has never worked here before.

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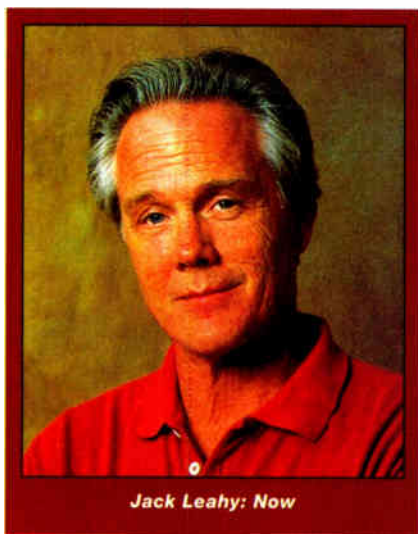
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who beat the odds

Nashville is finally breaking out of its stereotype of just doing country. We're starting to be recognized as a world-capable recording environment, where all styles can be recorded. The musician and songwriter talent pool in this town is just incredible. The number of people who have moved here from other markets—New York and L.A. and from all over the world—to be in this recording community is just amazing."

Even though Nashville may appear to be a migratory destination for recording people, Meadows advises incoming engineers to be capable of living for a year off of savings. "The schedules that the producers and record labels run require their booking of people far in advance to make sure they get who they want. Even for an established engineer from L.A. or New York, it's going to take time logistical-ly just to work into the normal schedule of available acts and available projects for people to give you a try. That's a survival reality."

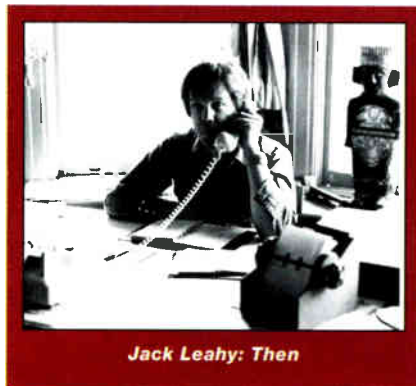


Jack Leahy: Now

Jack Leahy: Keeping the Funk at Russian Hill Recording

In the mid-'60s, near the heart of Haight-Ashbury, Jack Leahy was in the graphics business with a company called Funky Features, one of the origi-

nal companies producing and overseeing the printing of San Francisco's psychedelic posters. He had two partners and operated out of a building across the street from a house occupied by Big Brother & the Holding Company. In about 1968, the graphics business got too hectic for Leahy's taste, so he sold his interest to his partners and, having been a guitar player in the early '60s folk era, he thought it would be fun to build a 4-track recording studio.



Jack Leahy: Then

Leahy kept the name Funky Features to save further legal expense, at a time when the San Francisco music scene was very much an unfunded start-up. "A friend named Stan Markam came over one day with a guitar player named Carlos Santana, who at that time could not even afford an amplifier. He plugged his guitar into my hi fi set so I could hear what he sounded like. That's kind of where we were back then."

The driving force of Leahy's business adventure in the early days was his ambition to have a "competent multitrack studio," at a time when multitrack was in its infancy. In 1973, Leahy added a partner, Bob Shotland, to the operation, and before long they began designing, planning and building Russian Hill Recording studios, which was a three-year project from planning until it opened in 1980.

Originally a two-room facility, Russian Hill now has cycled through two remodels in each studio and also includes two new Pro Tools editing suites with a third editing bay on the way. The two also opened the John Storyk-designed Crescendo! Studios this year, near the core of San Francisco's advertising district. "It is an advertising-only facility, with two large mixing rooms with digital workstations and voice-over capability.

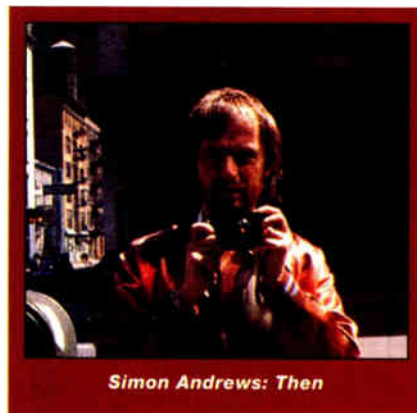
"I think the most difficult thing for me in this industry," says Leahy, "has

been the ongoing struggle to maintain an independent studio. It is a highly competitive business, very capital-intensive and requires constant reinvestment in hardware. The project studio has had a real impact on what we do, and so much of our traditional business is being done by people in an off-line situation or in their homes. We specialize in added elements, like food service, fax and Internet connections, creature comforts, etc., to make the days more productive for executives and producers who are dealing with multiple tasking while they are at the studio."

To survive as an engineer, Leahy advises the same formula he's been using to train engineers for the past 20 years. "Basically, the mechanical skills that every engineer needs are a good pair of ears, a good education and the experience to recognize what it is one is hearing and how to manage the techniques of recording. But on the practical side, and over the long term, the engineer has to be psychologically prepared. In a competitive world, clients become attached to engineers, and the engineers with a following are the ones with long careers."

Simon Andrews: Staying on the Right Track

Simon Andrews, owner of New York City's Right Track Recording Studios, was managing a couple of regionally successful acts in the early 1970s when he realized that it just wasn't the career for him. "I didn't enjoy it, I lost money



Simon Andrews: Then

at it, it just wasn't working for me," he says. "But I saw a tremendous need for a mid-level studio in Manhattan for acts such as mine—midrange acts. There were basically just a couple of

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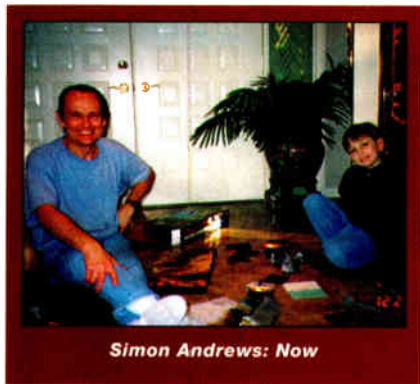
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who beat the odds

major studios in New York, and if you weren't a top star, you didn't get good treatment. So when my act broke up in 1975, I put together a studio down on 24th Street. It opened up at the beginning of 1976.

"In retrospect, I think the hardest part was the very beginning, when you pretty much have to do everything yourself and you can't make a mistake," he continues. "I did every-



Simon Andrews: Now

thing from engineer to maintenance, the bookings, everything. Being the kind of guy who thinks he can do anything he sets his heart to, I just learned how to do it."

Convinced he was on the right track, Andrews upped the ante in 1979. "I was offered a premises in midtown Manhattan—a run-down old Times Square building that had been used as an opera house. It was about 6,000 square feet, and I was offered it at a very reasonable rent. At about that same moment, Frank Filipetti became affiliated with Right Track, and I was then able to leave him in charge of the engineering aspect of the studio, so I could concentrate full-time on the ownership duties."

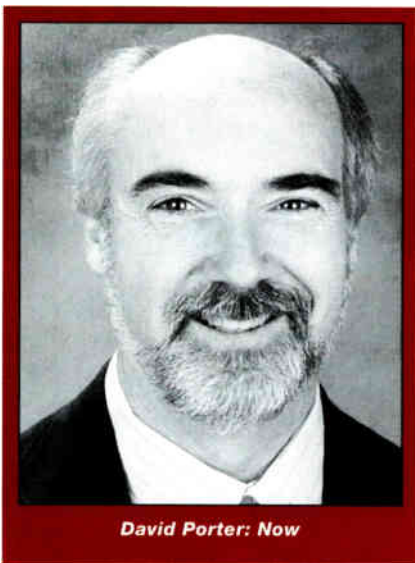
Right Track crossed the hump into the big-time studio world in about 1983, according to Andrews. "We were one of the first in New York to install an SSL console, in 1982, and immediately it became a huge success. We added a second one in 1983, when we opened our second room on 48th Street. By 1984, we were recording so many stars that by May of 1985 we had four of the *Billboard* Top 10 that had either been recorded or mixed at our studio."

Andrews' formula for survival in the studio business shows no surprises, just good client-oriented business sense. "It sounds fairly simplistic, but you have to have the right equipment, the right acoustical environment, the right support services, the right atmosphere within the premises...and they all have to work at 100 percent. If you keep doing that consistently, you'll do okay. But it's much easier said than done."

It's About Managing the Talent: Music Annex's David Porter

A more recent (1990) SPARS president, David Porter launched his Music Annex recording studio in the San Jose foothills in 1973 as a Tascam 4-track home studio. By 1975, he had moved up to eight tracks and soon expanded out of the house into a commercial San Jose building as a 2-inch, 16-track facility.

"I knew this was going to be my career," says Porter, "when I quit my day gig in 1975 working for Recording Specialties. The line of demarcation for me was that I could gross twice as much in my studio as I could working for an hourly wage. At the time, I was making \$1,100 to \$1,200 a month working, and when I was doing \$2,500 a month at the studio, I said, 'I think I can pay my bills and still pay

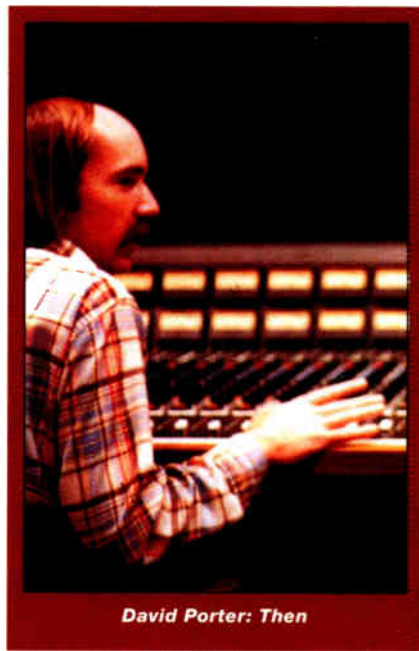


David Porter: Now

myself \$1,100 to \$1,200 a month,' and that was my criteria."

Porter's next big step came in August 1977 when he and new partners David Elder and Harn Soper made the leap to a 12,000-square-foot building

in Menlo Park, 40 miles south of San Francisco, where they built three rooms: a music room, a media room and a rehearsal space. "That was a make-it-or-break-it decision," says Porter. "We were either going to succeed and be viable, or it would put me under."



David Porter: Then

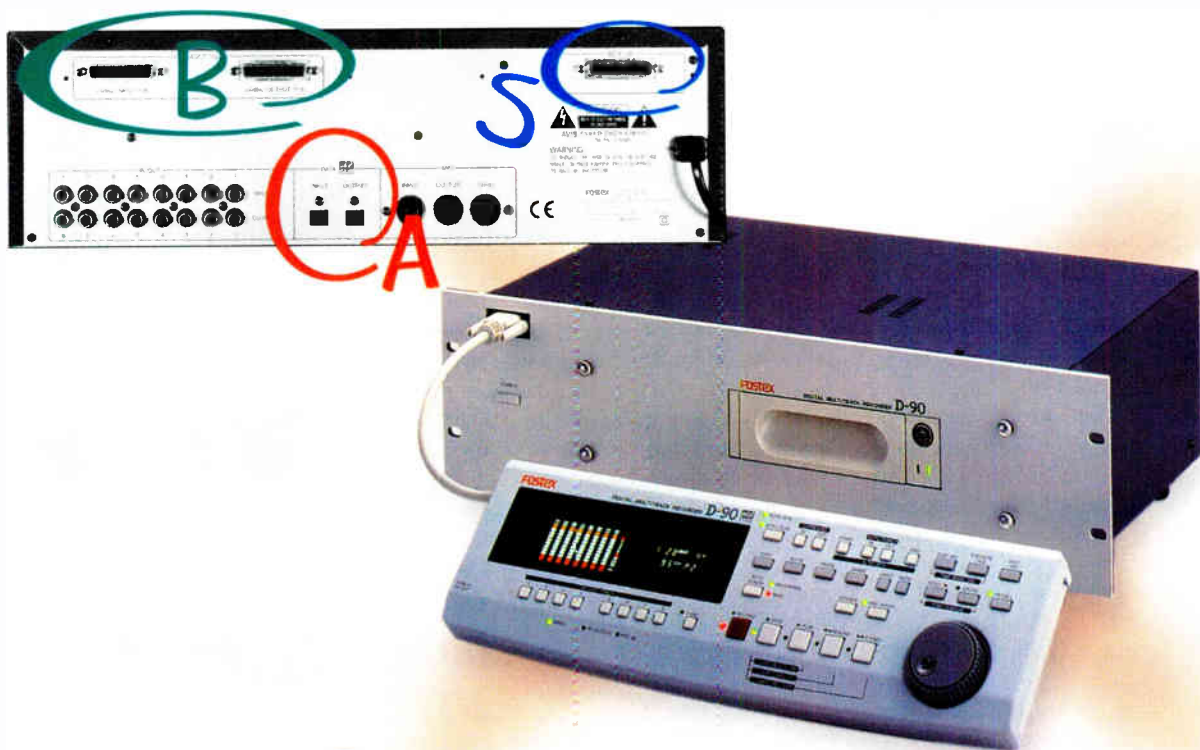
Rapid growth and track expansion continued at a frantic pace, and in 1984 Music Annex was approached by Apple Computer to create an audio cassette to help launch the new Macintosh computer. Within two months, this contract made Music Annex into a full-fledged duplication facility with an output of 100,000 tapes per month.

"Apple took us from being a relatively minor player to tripling in size within about a year," Porter says. "We went from doing \$400,000 to \$500,000 a year to nearly \$2 million in about 18 to 24 months. And we never looked back. That was kind of the point at which we became a real company with a corporate look on things, as opposed to Dave's sole proprietorship with a few of his pals."

In 1986 Porter jumped into the big-league advertising market by opening up a 3,000-square-foot, two-room facility in the heart of San Francisco's ad agency district. Meanwhile, the duplication business had ballooned so much by 1989 that it required its own facility, which he opened in the East Bay town of Fremont.

Today, Porter pilots a mothership that includes 15 studios and 45 employees in two buildings 40 miles apart. "The toughest thing to deal with

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in my job is managing very creative people. They are very opinionated in what they want, both technically and creatively, and I spend a lot of time trying to satisfy their requirements for the workplace, and at the same time make this place profitable. Talent drives this business, and I understand that I am a talent manager in a lot of ways. My success or failure is determined by how good the people are that I hire, and how well I can create facilities by and for them, and then manage them.

"My biggest fear in life, because the technology seems to be getting cheaper at certain levels, is that my engineers who have strong client relationships will go off and build their own boutiques. The underlying problem with that, of course, is they are then going to be expected to provide the same amenities and technical support and level of technology that their clients had back at the big shop. Eventually, the boutique, if it survives, stops looking like a boutique and starts looking like a facility, and that's why we have this ongoing shuffling of the deck in the studio business. My constant problem is that I've got to provide something so stable, so good, so powerful that my engineers aren't tempted to leave."

Street Smart:

Jimmy Dolan and

Streeterville Studios

"If you are prepared and can think on your feet, the surprises and developments and idiosyncrasies that always come with every project don't become problems," says Streeterville Studios' director of development and co-owner, Jimmy Dolan.

As an 18-year-old rock 'n' roll drummer and singer, Dolan began his recording career at Chicago's Streeterville as an apprentice/delivery boy in 1971. "Part of what drew me to the recording business was the idealistic thinking that was present in the late '60s and early '70s as I was considering what I wanted to do as an adult.

"Being exposed to the recording industry, I became aware that there was

a diverse community of people of all styles doing recording and film projects. The results and the professionalism of the person were more important to the project than where that person came from, what they looked like or what their background was. This aspect of the recording industry gave me the passion to make this my career within the first three or four months of becoming a delivery boy at Streeterville."

Streeterville has been around since 1969, when it opened as a three-room facility with one music studio and two audio post-production rooms. In 1979, it doubled in size, adding two more music rooms. Another 10,000 square feet were added in 1985—five new rooms.

Today, the operation is a seven-room music and audio post mother-ship. "Part of our success and our ability to sustain has been to be on some level of the cutting edge without putting ourselves in any too extreme position. You've got to have the ability to react to the changes that are happening. For example, today we're dealing with the reality that the technology is already upon us that allows every announcer in the world to have their own little recording setup at home so they can optimize themselves for any client anywhere. The top talent does this today."

Dolan advises newcomers that the best way to survive in this business is to maintain a constructive attitude and learn how to think. "How you think and handle yourself in the situation

that you're in truly sets the stage for whether you get more work. You are being looked at as a person who has to come up with a successful answer that's not only going to be successful at this moment, but two or three weeks later it needs to look and sound even better. The people around you, who are depending on you, need to feel comfortable and trust you. That trust sustains engineering careers for years and years, much more than just understanding how the equipment works."



Lou Gonzales: Now

Quad's Lou Gonzales

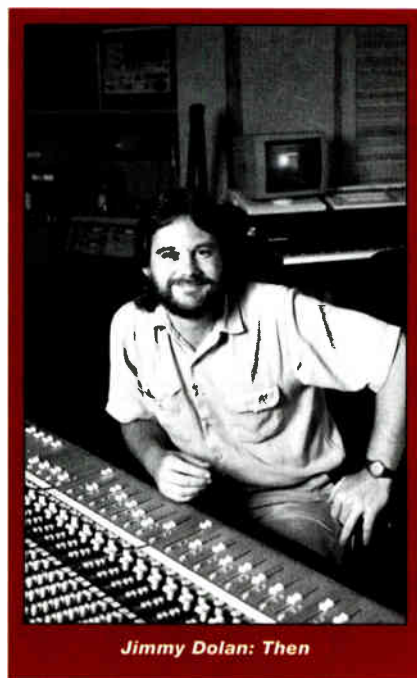
on Being Your Own

Customer

"You know how when you're a kid you want to be a fireman or something?" asks Lou Gonzales, owner/operator of Quad Studios in New York City. "I had this incredible drive and fantasy to have my own recording studio. It wasn't about trying to build a business or making money; I just wanted a studio."

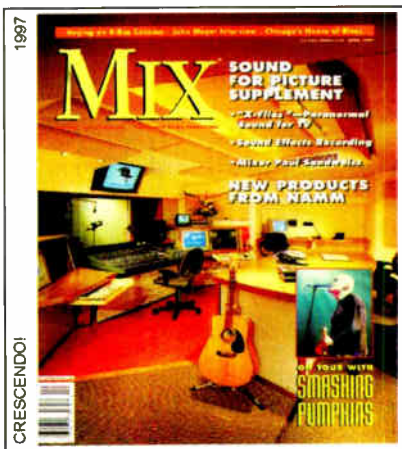
A talented and energetic electronics engineer, Gonzales began his career in radio, as both an on air personality and technician at WADO. His move to the studio came in his mid-20s. "One day I was sitting in the office of the chief engineer of the station, and while he was in the bathroom, a phone call came in from Mirror Sound recording studio asking for help. I took the call and told him I'd send somebody right over. So I sent myself over, and that was the beginning of my change from the radio to the recording business."

Gonzales then spent several years as an independent recording engineer before putting together Quad Recording in 1978. "I was working with two producers from *Sesame Street* who wanted to do a Broadway show album for something they were going to try



Jimmy Dolan: Then

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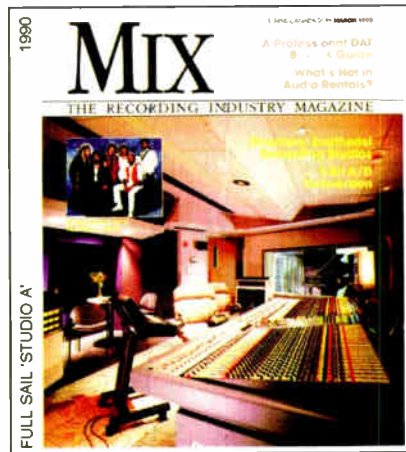
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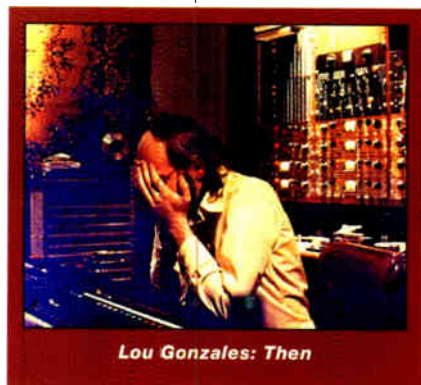


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who beat the odds

to sell. On a handshake, they agreed to bring me a couple of *Sesame Street* projects if I built a recording studio and gave them studio time to do their speculative work.

"Also at that time, I was lucky enough to meet a very talented guy



Lou Gonzales: Then

who was working as an auto mechanic. He opened the trunk of my car one day to do some work on it and he saw a couple of 2-inch masters I had left there. He called me and said that he had always wanted to learn about the recording business. So we got together and one thing led to another, and before long, he and I were building our first studio at Quad back in early 1978. We started with an old API 16-channel console and an Ampex MM1000 16-channel tape recorder. I think it was May 1, 1978, that we started doing the *Sesame Street Block Party* album.

Quad began with one large tracking room, which grew in popularity for the next five or six years. By the early '80s, though, the tracking business in New York had started to dwindle as MIDI and synthesized recording had moved most of the action into control rooms. "The next two studios I built had gigantic control rooms and little recording space. Then in the late '80s, the one tracking room I had left started to get calls for work—even though it needed renovation badly—because it was one of the few big rooms left in town. About that time I also decided to start doing live recordings of country bands, so I built another tracking room.

"Then I finally got up the courage to lease two pieces of equipment, a

Harrison 32x32 console and a Studer 24-track tape recorder. From that point on, I was committed to the business and couldn't think of it as a hobby anymore. I realized it was okay to borrow money to buy equipment if you could figure out how to make the equipment earn the lease payments."

Equipment purchasing is a very personal decision for Gonzales, because he sees himself as the ultimate customer. Unlike many studio owners who move from engineering to management, Gonzales is an engineer first, and every new piece of gear must pass his own critical trial before it goes into service for clients. His test is to keep his studio the kind of place where he would like to work. "Unlike a businessman who builds a business and hires people to make those decisions for him, I was the one that had to make all those decisions. I'm a recording engineer first, and a businessman second."

Ready for Anything:

Buddy Brundo and

Conway Recording

Studios

When recording at L.A.'s highly regarded Conway Recorders, an artist might just snag more than a studio tan. "My philosophy was to have studios that are outside-oriented," says Buddy Brundo, Conway's major domo and owner for 21 years. "All of the stu-



Buddy Brundo: Now

dios have landscaped grounds and big picture windows looking out on gardens. In my earlier career, as an engineer in the '70s, it just got too claustrophobic being locked up in all these rooms that were a door behind a door behind a door kind of places. I wanted to do things a little differently. I

moved to California to be outside, not inside."

Brundo started working as an assistant to a scoring mixer for Universal in the early '70s. He got hired to engineer



Buddy Brundo: Then

at Conway in 1972 when the operation was just one small studio with a 12-input Opamp console. By 1976, Brundo was doing so much engineering at Conway that he and his wife, Susan, decided to buy the studio. "Both of our parents had always been in business, and we were ready to learn from having our own business. We were either going to leave here and do something else or buy this place. So we bought it, and here we are, 21 years later, and we've expanded to 36,000 square feet and three studios."

Soon after taking over the studio, Brundo began looking to build more record business (the studio had concentrated on film sound for most of its existence). He took his first big technology gamble and replaced a 32-channel API console with one of the first 60-channel Neve 8108s in L.A. "That was a defining moment because we went from doing one kind of music into becoming more of a rock 'n' roll operation."

The cost of technology is not for the faint of budget, and, as every studio owner knows, this situation is not getting easier to deal with. "The 8108 I bought for only \$105,000. And that's when studio rates were higher than they are now. I just bought an SSL 9000J—\$100,000 is almost the tax on a console like that. And our rates are lower now! When you're betting on technology, every decision you make could be your last."

Some challenges for L.A. studios come with the territory, according to Brundo. "The home studios really had an impact on business, but I think the biggest threat to our business wasn't really that, or the gas crisis or the recession, but happened more recently with the riots and the earthquake. That

Loved by The King, The Chairman, The Material Girl, Some Hot Tuna & Everyone aboard The Airplane.

Don't tell Al Schmitt that names aren't important in recording. He has recorded, mixed, and produced some of the greatest names in history—everyone from Elvis to Frank Sinatra, Madonna to Steely Dan, Barbara Streisand to Toto, and Natalie Cole to the Jefferson Airplane. His Neumann mics (which he has been using and collecting since the mid-1950's) have even helped him win six Grammy Awards for Best Engineer. "I believe they are the best microphones in the industry," he says.

And when you also believe, as Al does, that great sound comes from good microphone technique (and not from constant EQ adjustments) you want to use the very best mics you can get. The natural choice for Al is Neumann. And while he has great affection for all of his Neumanns, he has grown particularly fond of his new M 149 Tube. "Like the original M 49, the M 149 Tube never lets me down," he says. "It's an extraordinary microphone—clean and crisp."

Being the award-winning professional and sound perfectionist that he is, Al has chosen to record the voices and instruments of so many of our favorite artists—Tony Bennett, Jackson Browne, Willie Nelson, Quincy Jones, Diana Krall, Dr. John, Michael Bolton, and many, many others—through his favorite mics.

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really put a damper on L.A. business for a couple of years. A tremendous amount of my business is not L.A.-based. So a lot of people who came from Europe, Mexico or any other place in the U.S. said things like, 'I'm not going to L.A. Are you crazy? We'll fall in a hole.' That really hurt our business."

Brundo sees consumer demand for audio quality as a wild card in developing technologies such as DVD and home theater but is nonetheless positioning Conway to take advantage. "As far as I'm concerned, the record companies have never been able to deliver to the user the quality we have here. Half-inch analog is amazing, and the only way they're going to duplicate that in the home is to go 96k, 24-bit, which we are trying to get DVD to do. There could be a lot of remastering, and that could be the next step. We're ready for anything."

The Importance of Being Ardent: John Fry and Ardent Recording

Memphis-based Ardent Recording owner John Fry found his way into the recording business because, as he says, "I was unable to find honest employment." His modesty is obvious to anyone who has watched, over the past 30-plus years, the steady stream of blockbuster R&B and rock 'n' roll records such as "Soul Man," "Knock on Wood" and *Led Zeppelin III*, emerge from Ardent, one of the most enduring and technologically advanced studios in the country.

"As a kid, I had a big interest in music and in electronics. I was brought up on the great rhythm and blues music of the late '50s and mid-'60s, and especially the English rock bands. I remember thinking, 'Boy, that's great, this is something really important. This is too cool to miss.' I later realized that what the English bands were doing was taking a lot of our R&B music and feeding it back to us in an Anglicized form."

Not unlike many of today's start-

ups, Fry assembled a garage studio when he was in junior high school. "We recorded garage bands in that garage studio. Ultimately, we moved



John Fry: Now

into a rented store building where we were from 1966 to November of 1971.

"Once we got out of the garage and really into the business, we had some great breaks. One of the greatest was

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&



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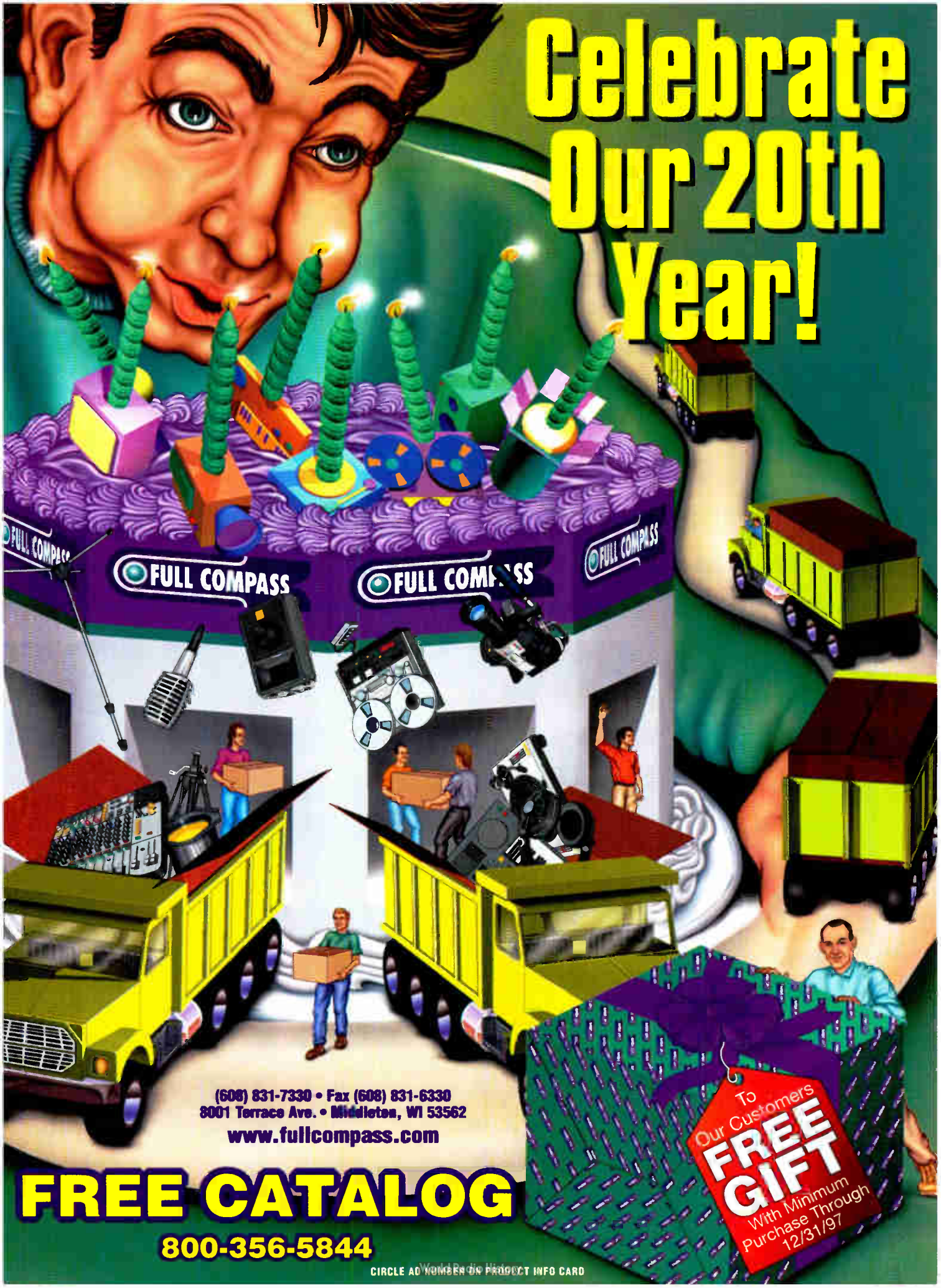
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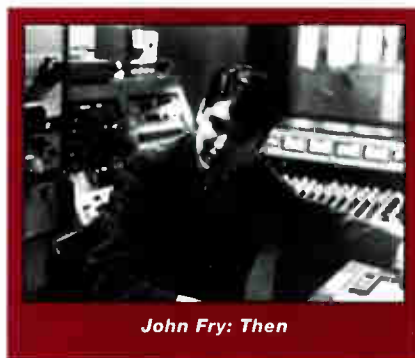
who beat the odds

that Stax Records, a big independent label, was Memphis-based, and we started at a time when they were really expanding. They had their own studio facilities, but they needed to use outside studios, as well. We became kind of their auxiliary studio, doing most of their remixing for a number of years, and a good deal of recording. So we got to work at kind of a pivotal moment with some of the great names in the R&B business."

In 1971, Ardent moved into the building they occupy to this day, adding on several times since then. Ardent now consists of three music recording studios, to go with an empire that includes a very successful contemporary Christian record label, which is distributed by Forefront Records, and a youth-oriented gospel label that is a booming part of EMI Christian Music.

This relationship with Forefront

represents more for Fry than just clientele. "When I was a kid, I was a child of the '60s and had no particular religious or other convictions. Somewhere along the way, God's been very gracious to me. I guess I would describe myself as an adult convert to Christianity. So being able to get involved in the contemporary Christian business is not just being in the record business to make money, although we want to have a successful company.



John Fry: Then

For me, personally, there's a real mission aspect to it."

In addition to the label activities, Ardent has long been active as music publishers, serving their artists and

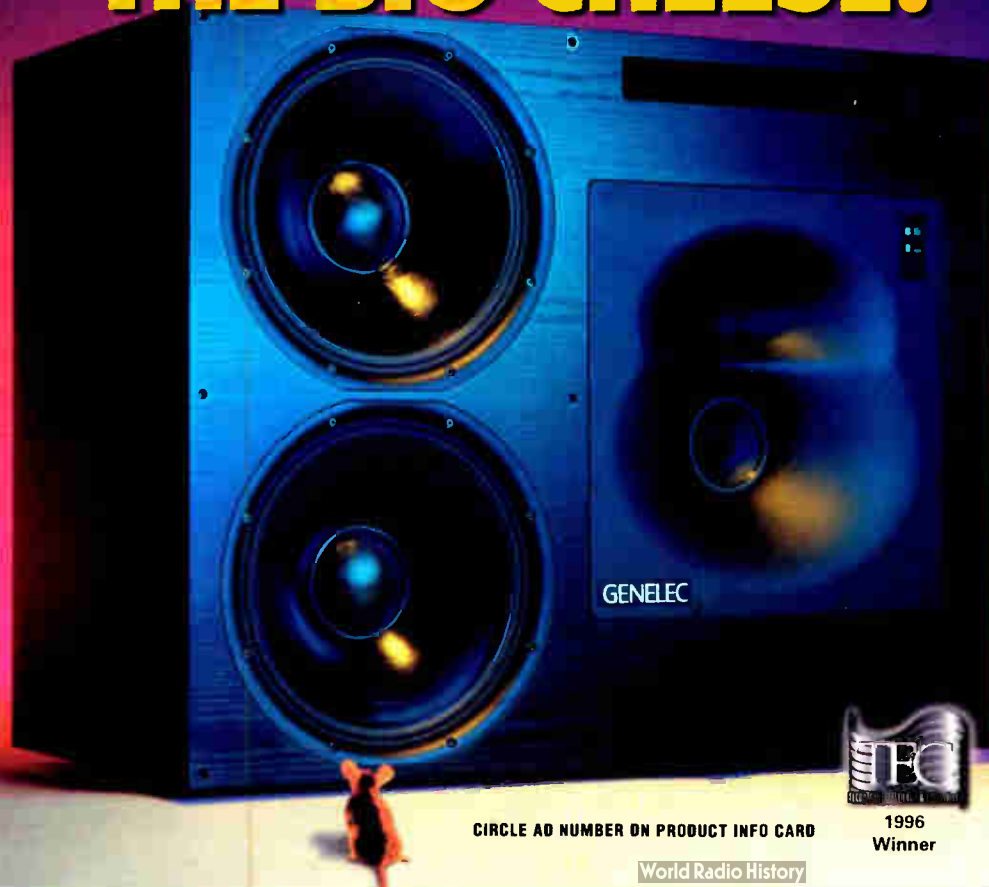
writers. "It's a good revenue producer, and we have a lot of songs from working closely with developmental artists who we've also signed as writers. Being owners of intellectual property as well as producers of the content has been a very important part of our business philosophy."

Fry's philosophy for survival boils down to: "If you're prepared to be surprised in this business and figure that change is normal, then you won't be disappointed. For example, there was a time not long ago when somebody said to us that we'd never buy another analog recorder. Well, surprise...the newest recorders I've got are analog."

For 17 of its 31 years, Ardent has been a SPARS member. "I finished a term as president last year and am now chairman of the board. I have found that participating in a civic sense in the industry is important for longevity. When you do that, you're giving something back to the industry that's been good to you, and that's always a good investment. And when you begin to talk to your colleagues all over the country, you find out that you are not alone. Other people experi-

—CONTINUED ON PAGE 114

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1996
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~ George Peterson, **Mix Magazine**, January 1997

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~ Jim Miller, **Electronic Musician**, June 1997



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World Radio History

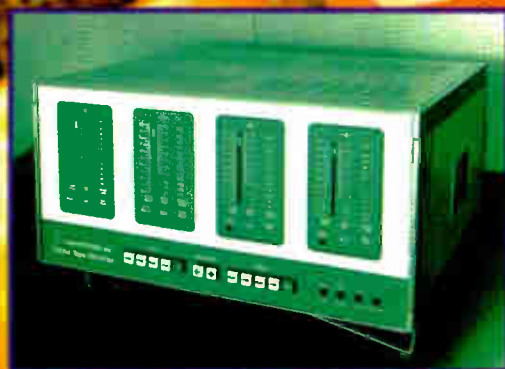
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1977: SSL consoles debut



1977: MCI—King of the 24-tracks



1977: Soundstream Digital

Evolution or Revolution?

by George Petersen

A Technology Retrospective

Technologically, the past 20 years have been one wild ride. And chronicling the changes over those two decades has turned out to be somewhat of a detective story, as many of the companies involved in the early years (such as MCI, Quad-8 and Soundstream) are out of business, while other well-known players—among them 3M, Mitsubishi and Ampex—have abandoned their audio hardware lines.

That said, let's look back at some of professional audio's technology milestones of the past 20 years. Given the space limitations, I have not attempted a complete listing of every company or product—just a few that somehow changed the way we all work. Please accept my apologies if this report doesn't include one of your favorite products, such as Sony's 1982 F-V7ET (a handheld vocal mic with onboard vibrato and echo effects) or the 1996 AES debut of J-Con's ¼-inch to 3-pin AC plug adapters, designed for converting AC extension cords to audio cables.

So if you were involved in audio during this 20-year span, enjoy this walk down memory lane; if you weren't, here's what you missed:

1977: The Revolution Begins

Two decades ago, the concept for *Mix* magazine emerged from a perceived need for a directory that would provide producers, engineers and musicians with comprehensive data on the burgeoning recording studio industry. Today, it's difficult even to recall those pre-Internet, pre-fax, pre-cellular, pre-cable, pre-CD, pre-FedEx, pre-MIDI, pre-MADI, pre-PC, pre-MTV, pre-Mac, pre-DOS, pre-DAT, pre-DAW days.

In record stores, vinyl was king and 8-track was the leading prerecorded tape format. Studios were filled with gear from such wonderful (yet now nearly forgotten) names such as, Allison Research, Ursa Major, EXR, MasterRoom MicMix, Dokorder, Stephens, Quad-8, Scully, SAE, Phase Linear, Tapco, BTX, Q-Lock, Lang, Pulsar, MXR, Electrodyne, Universal Audio, Marshall Electronic, EECO, Cooper Time Cube, Spectra Sonics, Roger Mayer, Quantum, Sphere, Tangent, Neptune, Interface Electronics, Orange, DeltaLab and—just for the fun of it—let's throw in a couple padded, blue-sparkle Kustom bass amps. Fortunately, some of the good stuff lives on: Anthony DeMaria Labs makes a swell knock-off of the UREI LA-2A, while Manley Labs still produces Langevin and Pultec gear. And API is back, keeping those great EQ's and consoles

coming.

It is perhaps surprising that so many of the key suppliers of studio gear in 1977 are still in business: AB Systems, ADA, Akai, AKG, Allen & Heath, Altec, Amek, AMS, Aphex, API, Ashly, Audio Design/Recording, Audio-Technica, AudioArts, Bag End, Barcus-Berry, Beyer, BGW, Bryston, Carvin, Cetec Vega, Community, Conquest, Crest, Crown, D&R, dbx, Denon, DOD, Dolby, EV, Eventide, Furman, Galaxy, GoldLine/Loft, Gotham, Hafler, Harrison/GLW, HHB, JBL, Klipsch, Korg, Koss, Lexicon, McIntosh, Marantz, Marshall, Micro Technology Unlimited, Nady, Nagra, Nakamichi, Neumann, Neutrik, Neve, Otari, Peavey, QSC, Roland, Schoeps, Sennheiser, Sescom, Shure, Solid State Logic, Sony, Soundcraft, Speck, Studer Revox, Studiomaster, Symetrix, Tascam, TC Electronic, Tektronix, Telex, 360 Systems, Whirlwind, White, Wireworks, Yamaha, Yorkville and dozens of others.

A fair number of products available in 1977 are still in production, especially microphones. On a drum session—then or now—you might use a Beyer M88 on kick, Sennheiser MD-421s on rack toms, Electro-Voice RE20 on floor tom, Shure SM57 on snare, Neumann U87s on overheads and an AKG C-414 on hi-hat. But generally, in

terms of recording studio technology, 1977 was worlds away from 1997.

Certainly the technological changes over two decades have been startling, but one of the most interesting contrasts between these two eras is in the persona of the audio engineer. More often than not, in the pre-'80s era, studio owners and engineers had extensive experience in electronics and circuit design. Part of this stemmed from the high degree of maintenance required by audio systems of that vintage (fader grease, anyone?), but, equally, from a need to create custom products (or modify existing ones) to create a workable recording environment. In fact, according to a summer 1977 studio equipment usage survey conducted by *Billboard* magazine, the most common consoles in U.S. studios were custom designs (14.5%), slightly edging out MCI at 14.3%, followed by Tascam (8.6%) and—in diminishing order—API, Audiotronics, Neve, Electrodyne, Langevin, Spectra Sonics, Opamp (available in kit or finished form), Quad-8, Harrison, Audio Designs, RCA and Sphere.

At Solid State Logic's first public appearance at the 1977 AES convention in Paris, the company debuted the 4000 A Series console, complete with Studio Computer. Though a well-

known UK studio owner remarked, "No one will ever buy a console with a television in it," the board had all the foundations of the 4000 range: in-line channel, small fader, track arming and dynamics on every channel, along with computer-controlled automation and tape machine control.

Other than custom monitor designs—typically developed from JBL or Altec components—control room speakers were almost the exclusive domain of the Altec 604E (a two-way, co-axial 15-inch woofer/compression driver design), either in stock "utility" cabinets, custom enclosures, modified third-party designs (Big Reds) or some combination of all of the above. Common variants combined the 604E with an alternate crossover, either home-brewed or commercial, such as Doug Sax's Mastering Labs model. Over the years, the affinity for the 604E may have waned in the studio, but the speakers would later regain popularity as the basis for the UREI 813.

Of course, same as today, every 1977 studio needed a variety of speakers, and leading this category were the venerable JBL 4311 and Auratone Cubes.

At this time, Ed Long, under the name of Calibration Standard Instruments, was introducing the MDM-4 Near Field Monitor™ with his then-revolutionary concept of near-field speakers. Long (who holds the trademark for the terms Near Field Monitor and Time Align) would continue to make his mark on the industry with his involvement in UREI crossovers and ELF™ subwoofers. It seems safe to say that in 1977, no one could have predicted the impact that the MDM-4 Near Field Monitor would have on studios



1977: Everybody needed Auratones

worldwide 20 years later.

Steve Wozniak and Steve Jobs incorporated Apple Computer in January 1977. The Apple II—the first PC with color graphics—was delivered four months later. It didn't have a disk drive but was only \$1,300, including a whopping 4K of RAM.

In March 1977, David Cox and Hal Chamberlin founded Micro Technology Unlimited (MTU) and started shipping music synthesis software and 8-bit D/A converter boards for microcomputers. In 1979, MTU's Delplay-12 was the first professional-quality direct-to-disk DAW on a microcomputer; and a sample-accurate waveform editor followed in 1980. Now offering its Krystal DSP workstation, MTU is the oldest company in the field.

Furman Sound was selling its PQ-3 parametric EQ/preamp—the first rack-mount box for the M.I. market—although nobody believed musicians would buy rackmount gear. Now, 20 years later, things are a little different...

Nationwide, MCI was the leading manufacturer of 2-inch analog 16- and 24-track machines and, with Ampex and 3M, controlled 83% of the market, followed by Studer with a 3.1% share. The 8/4/2/1-track market was dominated by Ampex (37.3%), in large part due to its popular 440 Series, followed by the 1977 debut of its superb ATR-100 Series, considered by many to be among the best 2-tracks ever made. A smaller share was held by Scully, which also marketed a 1-inch, 12-track deck, a format that never really took off. Tascam made history by introducing the 90-16, the first 1-inch, 16-track recorder.

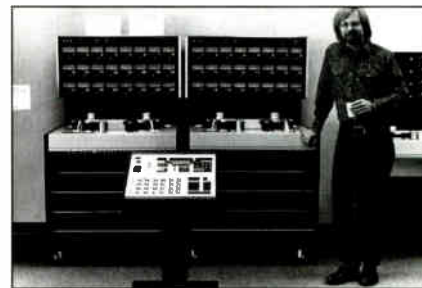
It should be noted that 1977 was the year in which the first commercial digital recordings were made using Dr. Tom Stockham's Soundstream Digital system. After demonstrating some opera demo recordings at the spring 1977 AES in L.A., Stockham was invited by Lincoln Majorca of Sheffield Records to cut *The Art of Fugue* album on his Town Hall label.

1978

Blast-Offs and Fizzles

3M, a major supplier of professional analog recorders, with its M Series of multitrack and 2-track machines, had spent several years developing a digital recording system, including two years of joint research with the BBC. The result was the 3M Digital Audio Mastering System, which consisted of a 32-track deck (16-bit, 50kHz audio on 1-inch tape at 45 ips) and a 4-track, ½-inch mastering recorder.

Although the 3M system was a year away from actual deliveries, engineer Tom Jung (now of DMP Records)



1978: Studer A800s arrive.

agreed to beta-test the prototypes at Sound 80 in Minneapolis, using them as a backup system during sessions being cut direct-to-disk (lacquer disks, *not* hard disk!). The digital session tapes were judged superior to the disk masters, and in December 1978, the first commercial albums cut on the system were released.

Priced at \$150,000 (\$115,000 for the 32-track and \$35,000 for the 4-track), the first two-machine systems were installed at Sound 80 and in Los Angeles at A&M Studios, Record Plant and Warner Bros. in early 1979.

Also on the digital recording front, Sony unveiled the PCM-1600, a 2-channel recording processor that stored digital audio on ¾-inch videotape. The advantage of the system



1978: 3M Digital System

1977

► Milestones

Apple II unveiled
First Dolby Stereo films released
First commercial digital recordings
Near Field Monitor™ developed

► Beginnings

Apple Computer Inc.
Audio Control
CCS Audio Prods (Musicam USA)
EAR Pro Audio
Micro Technology Unlimited
Mix magazine (*The Mix*)

► Anniversaries

100th—Berliner invents audio disc
100th—Edison invents analog
phonograph
50th—Electro-Voice

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1978: Sony PCM-1600 system

(which would eventually become the PCM-1610/PCM-1630 format now used in CD production) was that it used modified video editing controllers to simplify the process of digital editing. A number of companies, such as Van Webster's Digital Sound Recording in Los Angeles, installed systems and began offering digital editing services to the public.

For those on a budget, Sony's PCM-1 (\$5,500) was a 14-bit system that also stored audio tracks on videotape. The PCM-1 arrived a bit before its time: Four years later, Sony's PCM-F1 would make budget digital a reality for thousands of studios.

At AES Europe, Sony also showed a prototype digital machine that recorded 24 tracks on 1-inch tape. It never went into production, but it did lay the groundwork for Sony's highly successful DASH-format machines.

In 1978, Eventide Clockworks followed up its successful H910 Harmonizer™ with the H949, having greatly improved performance (out to 15 kHz!), while offering +1/-2 octave pitch shifting and a whopping 400 ms of delay. A year later, a new daughter-board added "intelligent" deglitching for smoother operation. Based on its success, Eventide came out with its Instant Phaser, Instant Flanger and Omnipressor products. In 1987, the H3000 became the first software-based Harmonizer. The next-generation Ultra

Harmonizer DSP4000 arrived in 1993, and today its flexibility continues to be expanded via regular software updates.

SSL's 4000 B Series, with more sends, expanded EQ and a different dynamics section, debuted in 1978. The first 4000 B went to Munich's Country Lane Studios and is still in use today. Only six B Series consoles were produced. In the States, two were installed in L.A. at the now-defunct Kendun Recorders and the old Third Street Record Plant; the first board used for post went to Producers Color Service in Detroit.

MCI, the undisputed leader in analog multitracks, unveiled a 32-track analog deck that recorded on 3-inch tape. It went nowhere. MCI did much better with its JH500 and JH600 Series consoles, which were launched in 1978 and soon became ubiquitous. In fact, ten years later, MCI still held the leading share (17%) of consoles in 24-track studios.

Otari began shipping its 5050B, an analog transport that became the standard for affordable, rugged recorders and remained in production until a few years ago.

One multitrack design that became popular was the Studer A800, with the first machine arriving in North America in 1978 for installation in Guy Charbonneau's Le Mobile remote recording truck. Incredibly enough, 18 years, thousands of sessions, tens of thousands of miles and (probably) dozens of head stacks later, that same machine is in service today, although many years ago Charbonneau did upgrade the original from 16- to 24-track (and added a second A800 for 48-track dates).

In 1978, UREI entered the speaker market with its 813, a large monitor based on a modified Altec 604 co-axial driver and a second 15-inch woofer handling sub-bass. A year later, the company would introduce its 811 (single co-ax driver) and 815 (co-ax plus two subwoofers). However, the 813 was clearly the best of the bunch, becoming so popular that years later, other manufacturers—such as Tannoy, KRK and JBL—were building monitors with dimensions tailored to fit into UREI 813 soffits.

The year's most inauspicious debut: Yamaha's consumer hi-fi group unveiled the NS-10M speaker. At the time, no one in pro audio used them, and they didn't rise to prominence for another five years, when they began

replacing Auratones as the most common reference speaker.

In January 1978, keyboardists marveled at the Sequential Circuits Prophet 5, a programmable 5-voice polyphonic synth offering lush, fat, rich analog sounds with the ability to store and immediately recall various settings. Despite a lofty \$4,500 price tag, the synth was a hit, and sounds of the Prophet's analog string and brass patches became an inescapable staple



1978: Behold the Synclavier

of pop music for years.

But from a technology standpoint, the 1978 launch of New England Digital's Synclavier—the first commercially available, real-time digital synthesis instrument—was a monumental achievement. Over the years, the Synclavier would develop from a musical instrument to an all-encompassing digital production environment, breaking new ground by combining keyboard sampling and synthesis with its Tapeless Studio™ and Direct-to-Disk™ recording technologies.



1979: Fairlight co-founder Kim Ryrie at the helm

1979

Changes Afoot...

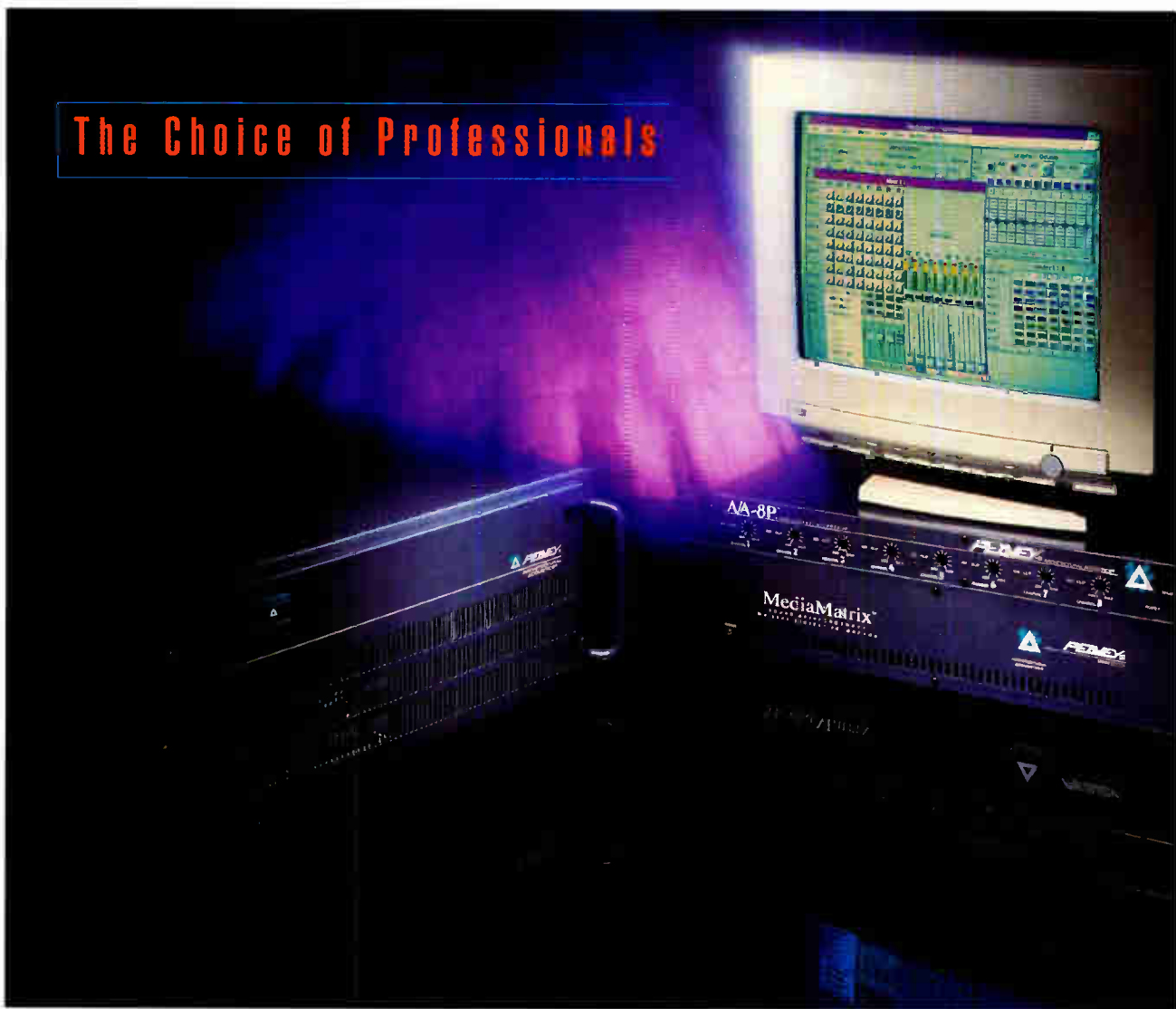
Ironically, one of the major changes in 1979 came not from a high-end digital gizmo, but from a down-market analog device. Sony's TPS-L2—its first Walkman® personal tape player—brought consumers a whole new way of listening to music. Suddenly, recording engineers found themselves needing to check mixes not only on Aura-

1978

- ▶ **Milestones**
 - First digital 32-track multitrack
 - First video-based digital editor
 - Yamaha NS-10M debuts
- ▶ **Beginnings**
 - Eastern Acoustic Works
 - Genelec
 - McPherson Loudspeakers
 - Opti-Sound/Opti-Case
- ▶ **Anniversaries**
 - 50th—George Neumann Co.
 - 20th—First stereo LPs sold
 - 20th—IC's developed at T.I.

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1979: TEAC Model 144 Portastudio

tone Cubes for that "AM radio/TV" sound, but also on headphones.

The winter EuroAES in Brussels offered a number of surprises. Quad-8 unveiled Coronado, an automated 40-input console, but it was eclipsed by the showing of SSL's 4000 E with Interactive Studio Computer. Largely based on feedback from B Series users, the 4000 E incorporated most of the features found in SSL's current G Series range. Reportedly the most expensive console in the world, a 48-channel SL-4000 E was priced at \$185,000, not including another \$32,000 for the Studio Computer.

Calrec unveiled its radical Soundfield CM4050 system, consisting of a microphone with four capsules arranged in a tetrahedral array and a remote-control box that allowed the user to remotely control the mic's stereo pattern, polar response and outputs (mono, stereo or 4-channel).

Tannoy introduced its M1000 Super Red monitors. Although there was no connection between the Super Reds and the Altec 604-based Big Reds, both were large monitors with point-source 15-inch drivers. The Super Reds

employed a Dual-Concentric (coaxial style) 15-inch driver and a choice of internal crossover, or a bi-ampable version.

Lexicon began shipping its 224 Reverbation System, consisting of a compact, console-top controller with four-rackspace brain, two inputs, four outputs, and interchangeable (!) programs to simulate chambers, plates and rooms. The 224 was hailed as "affordable," meaning \$7,500 with two programs or \$7,900 with four programs.

For fans of analog multitracks, 1979 was a banner year. Otari introduced the MTR-90; its smooth, pinchrollerless, servo-controlled transport made it a favorite among engineers, and the deck eventually became the most common 24-track in the U.S. Ampex introduced the ATR-124, with advanced features such as four programable EQ settings assignable to tape speeds, touch-variable shuttle control and extensive electronic editing functions with insert controller. Unfortunately, due to its high price, the ATR-124 never really caught on.

In June of 1979, Tascam announced the Model 85-16, its second-generation 1-inch 16-track. Although this format was only accepted by one major recorder manufacturer—Otari (or three others if you consider ITAM and Soundcraft as major players in the recorder market)—the 1-inch, 16-track format effectively bridged the gap between the project studio and the pro facility, often finding its way into both environments.

The real bombshell arrived with the September 1979 introduction of the TEAC Model 144 Portastudio®, an integrated 4-track cassette recorder and a 4x2 mixer with pan, treble and bass on each input. By modern standards, the 144 was simple and offered only passable sound quality. But to musicians seeking a sketchpad device to record musical ideas and demos, the 144 was an overnight sensation, a runaway success story that continues today with the company's Digital Portastudio Model 564, which records four tracks of digital audio on data-format MiniDiscs.

The year was also a milestone for Fairlight, which began shipping its Series I CMI (Computer Musical Instrument). Based on two (!) 6800 processors, the CMI provided digital synthesis with a 6-octave keyboard. The system provided onscreen displays of waveforms, which could be modified via Fourier synthesis or simple light-

pen redrawing of the waveform, and also offered sampling, with the ability to pitch shift sounds or make modifications via the CMI processor. Revolutionary, to be sure, and there would be much more from Fairlight in the years to come...



1980: Roger Linn's drum machines begin their conquest of pop music.

1980

A New Decade Dawns

Roger Linn introduced the Linn Electronics LM-1 Drum Computer, the first programmable drum machine with sampled sounds (followed by the second-generation version, the LinnDrum). As the first drum source with realistic drums (as well as an onboard mixer and 12 individual outputs), the LM-1 was an instant success, even at \$4,995. Suddenly, jobs began to spring up for drum machine "programmers." Pop music would never be the same.

Crown introduced the Pressure Zone Microphone®. Radical new ideas in microphones don't come along very often, and over the next couple of years the engineering community became caught up in a frenzy, trying to use PZMs on *everything*.

JBL's new BiRadial horn offered wide 100°x100° dispersion and smooth response. The first studio products to use the technology were JBL's 4030

1979

► Milestones

Sony Walkman introduced
Tascam PortaStudio debuts
First digital sampling instrument

► Beginnings

Groove Tubes
Linn Electronics (Roger Linn
Design)
Meyer Sound Laboratories
Monster Cable
Renkus-Heinz Inc.
SKB Corp
Turbosound

► Anniversaries

30th—Microgroove LP

1980

► Milestones

First sampled sound drum
machine
Crown PZM™ microphones debut

► Beginnings

Crest Audio
Mark of the Unicorn
Microtech Experts (Microtech
Conversion Systems)
Stanford Research Systems

► Anniversaries

70th—Nippon Columbia
(Denon Electronics)

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and 4035 monitors (BiRadial horn plus single- or dual-15 woofers, respectively). Offering high SPL capability, and a large sweet spot, these were an ideal match for the growing dimensions of control rooms and post-production suites, where the number of people in the listening area seemed to increase



1980: Mitsubishi X800

exponentially every year, especially in the agency market.

The compact disc standard was proposed and later adopted by the Digital Audio Disc Committee. Product introduction in the U.S. was still three years away.

Designed to compete with Sony's PCM-1600, the JVC DAS Series 90 Digital Audio Mastering System was another 2-channel recording/editing system that used U-matic tape as the storage medium—but it was incompatible with PCM-1600 tapes. In November, Sony showed the PCM-1610 system, which eventually became the standard medium for CD mastering for more than a decade.

Mitsubishi began delivering its 2-track, reel-to-reel digital machines in X80 ("portable") and X80A (floor console) versions. Best of all, the decks' extensive error-correction circuitry allowed tape editing using conventional splicing. At the fall AES in New York, Mitsubishi previewed its X-800, a digital recorder storing 32 tracks of audio on 1-inch tape running at 30 ips.

For the first time, companies specializing in "digital rentals" began appearing in the New York, L.A. and Nashville markets, bringing digital multitracks to a wider audience.

Aphex began *selling* its 602B Aural Exciters, which had previously been available only on a rental/royalty basis. The price was only \$2,750!

Speaking of signal processing, 1980 offered a lot of advances and products that remain desirable today. dbx launched its 900 Series of modular signal processing. AMS introduced the DMX 15-80 stereo digital delay line, with a then-impressive two seconds of

memory at a bandwidth of 18 kHz. Lexicon introduced its PCM-41 DDL. EMT's new Model 251 (\$20,000) sported a 32-inch-tall, upright enclosure that looked more like the controls to a spaceship than a spatial processor. The 251 offered seven reverb programs and 16-bit/15kHz performance.

On the console scene, Sound Workshop showed its Series 20, 30 and 40 models—the latter with eight (!) aux sends and ARMS automation. Neve debuted the 8108, which could store up to four console assignments. Solid State Logic countered the challenge with the introduction of its SL-4000E with Total Recall.

1981

The Video Age Arrives

Neve introduced Necam II automation for the big studios, and Soundcraft launched the Series 800. Available in recording, P.A. and monitor versions, the Series 800 went on to sell in the zillions (relatively speaking) over the next ten years.

Fostex formed a U.S. division in May 1981 and showed the Model A8, a new multitrack that recorded eight tracks on 1/4-inch tape at 15 ips—yet another format.

Just as Mitsubishi began delivering its X-800 32-track digital machines, Sony countered by unveiling its PCM-3324 digital 24-track, which was still two years from shipping. The original PCM-3324 retailed for \$150,000—today, the newest-generation PCM-3324S is priced at slightly more than one-third that amount.

B&W introduced its 801 speakers, which even today remain a favorite of classical music engineers. On the big sound front, Westlake brought out its TM-3 (three-way bi-amp) and TM-4 (four-way tri-amp) studio monitors.

Signal processing kept improving. DeltaLab showed its AcoustiComputer dual delay; Lexicon introduced the Super Prime Time programmable delay; and AMS launched the RMX-16 reverb (still a sweet box). But my "1981 Vision of the Future" award has to go to Eventide's SP-2016 effects processor. Priced at \$9,000, it featured plug-in software changes via a bank of ROM sockets. This would become the first effects box to offer new sounds via third-party DSP "plug-ins."

June 1981: Michael Nesmith releases *Elephant Parts*, an album of songs done as video clips and released on

video only. The video-only concept didn't fly, but the clips were stylish and entertaining, ideally suited for cable networks such as MTV, which debuted in August 1981.

The burgeoning music video industry soon became a double-edged sword: While young hands fought to get \$50,000 for a recording budget, the labels busily planned for music videos budgeted at up to \$100,000 each. Sud-



1981: Sony's Rick Plushner (in dark glasses) shows off a PCM-3324 prototype to Chris Stone and Record Plant crew.

denly a band's commercial viability began to depend on the video's "look," and the music was almost secondary.

In August 1981, IBM introduced the Personal Computer, perhaps the decade's most significant development. Hardly a powerhouse, the original 8088-based PC had 64K RAM, a blinding 4.77MHz speed and was

1981

► Milestones

IBM PC introduced
First CD produced
First DSP "plug-ins"
MTV begins broadcasting

► Beginnings

Fostex U.S.
Gepco International
Hot House Professional Audio
Rane Corp.
Simon Systems Engineering
Trident USA

► Anniversaries

25th—Young Chang

Greg Goldman



Photo: Lucia Studio: Brooklyn Recording

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BASF

priced at \$3,000 (\$6,000 for a version with color graphics). At least it included MS-DOS 1.0...



1982: The Sony PCM-F1 brings low-cost digital to the masses.

1982

CD and Surround Sound Debut

January 1982: Commodore intro'd the C-64, with 64K RAM and color graphics. At \$595, it eventually sold 20 million units and became a major keystone in the early days of MIDI.

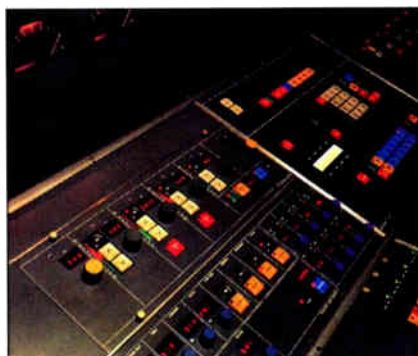
Oberheim introduced the DMX drum machine and, combined with its OB-Xa programmable synth and DSX 8-track sequencer, created The Oberheim System—a complete synth/drums/sequencing workstation. The system had a 6,000-note capacity, but it was not MIDI, which was still a year off.

Neve announced the first digital mixing console, known as the Neve DSP, a large, full-scale design. The console featured CCR (Complete Console Reset), full assignability of controls and automation of all console functions. The electronics package was located remotely, an approach that became commonplace years later with products such as the Euphonix Crescendo. The BBC took delivery of the first DSP, a 48-channel model.

Dolby debuted its Consumer Surround Decoder, a home device for extracting the surround channel from a Dolby Surround-encoded film played

on a stereo VTR. Years before its time, the product fizzled, but it laid the groundwork for a coming revolution in home theater, which would be fueled by the arrival of Beta/VHS HiFi decks and Dolby Pro Logic-equipped stereo components in years to come.

CD players and discs were introduced in Europe and Japan; the U.S. launch was slated for 1983. Meanwhile, for consumers who wanted to make digital tapes of their CDs, Sony showed the PCM-F1, a digital audio recording system based on the EIAJ 14-bit PCM specification for digitizing audio and storing it on videotape. The concept of a two-piece system (connecting a PCM processor to any VCR [Beta, VHS or U-matic] for recording) was unpopular with consumers, but at \$1,900, Sony's PCM-F1 was a hit with studios. The Technics SV-P100 (\$3,000) went one step further: It was a 14-bit EIAJ processor combined with a VHS transport. Years before DAT, it was the first digital audio cassette recorder, and Mobile Fidelity even released a few projects—such as Pink



1982: Neve Digital Console

Floyd's *Dark Side of the Moon*—on PCM VHS tapes.

PCM processors from Aiwa, Akai, Sansui, JVC and Technics rigidly stuck to the 14-bit EIAJ standard; only Sony's PCM-F1 (as well as the later PCM-701/501/601 units) and the Nakamichi DMP-100 (a black-finish F1 with improved analog components) offered a choice of (switchable) 14- or 16-bit performance. A few brave souls—myself included—went so far as to make multitrack recordings using two synchronized PCM-F1s. One thing was certain: Whether stereo or 4-track, the democratization of digital had arrived.

Finally, Quantec introduced the QRS Quantec Room Simulator, which 15 years later is still considered by many to be among the best reverbs ever built.



1983: Sony's Toshi Doi and Studer's Roger Lagadec celebrate the DASH announcement.

1983

Small Disc, Big Prices

The CD finally arrived in America, but the players were expensive, and the availability of titles was limited. Record labels figured out that the CD was the key to a gold mine; despite the premium charge for CDs, royalties on older recordings were paid at the old vinyl rates, and CD reissues soon became a major part of the record business. Mindful of this, The Beatles refused to have their material released on CD until years later, when the royalty issue had been resolved.

January 1983: After years of behind-the-scenes meetings between U.S. and Japanese manufacturers, the Musical Instrument Digital Interface was demonstrated to the public for the first time at Winter NAMM. Sequential Circuits founder Dave Smith used a Prophet-600 to control a Roland synth via MIDI. At the time, no one dreamed how important this day was.

Also in January, Apple launched the Apple IIe (\$1,300), a 1MHz machine with 64KB of RAM and a whopping seven expansion slots, which—in the years to come—provided a happy home for numerous MIDI interfaces that became part of the growing computer-based music industry. Two months later, IBM countered with the PC-XT. It cost \$5,000 and included 128KB RAM, a 360K floppy drive and a whopping 10MB hard drive. Most people wondered what they'd ever do with that much storage.

Sony finally began delivering its PCM-3324 digital 24-track. The first U.S. sale went to John Moran of Houston's Digital Services.

Crown announced the TEF® System 10, a spectral analyzer/acoustical measurement system in a 40-pound case.

1982

► Milestones

MIDI standard established
Dolby Consumer Surround debuts
First digital console
Sony PCM-F1 launched
CDs released in Japan, Europe

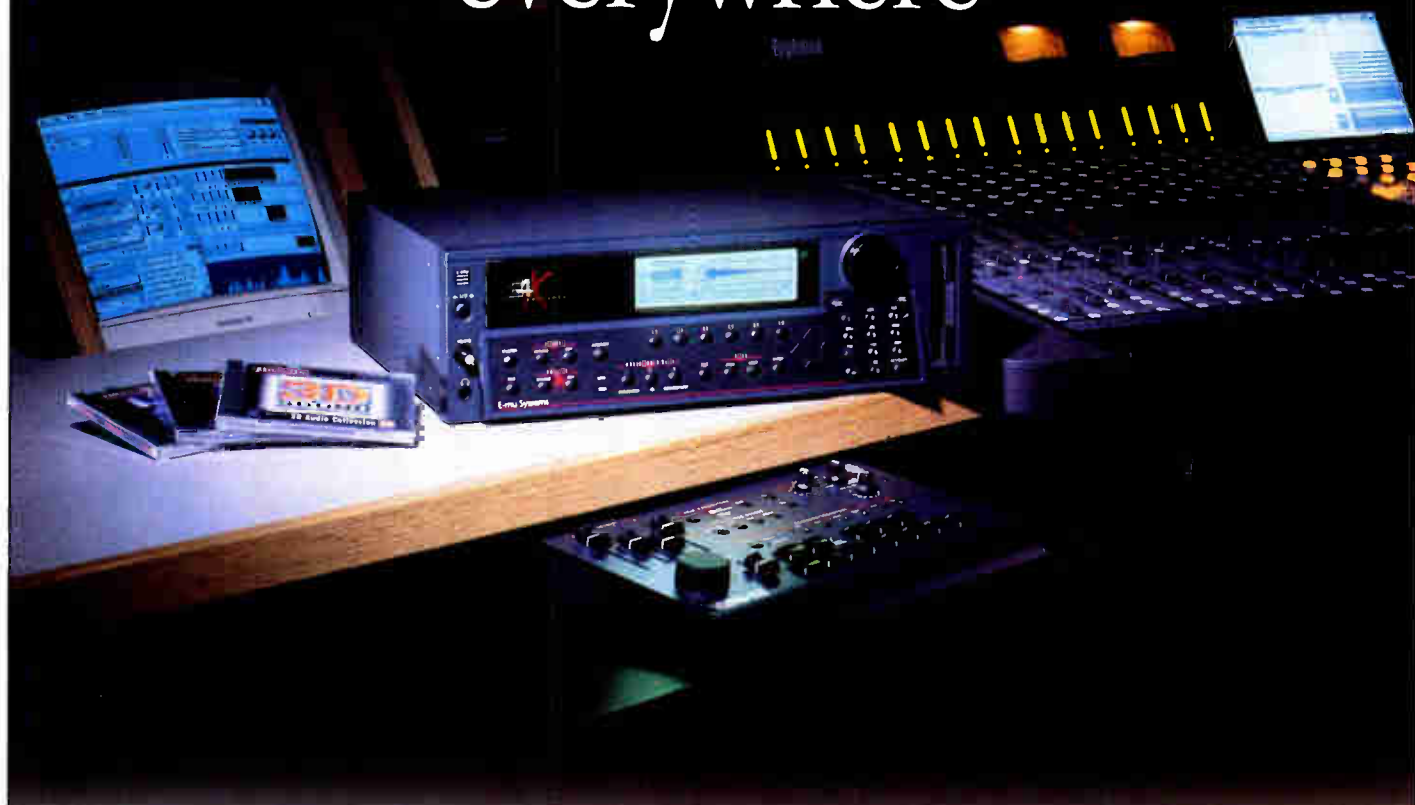
► Beginnings

Ensoniq
Rane

► Anniversaries

10th—First PCM recorder, Denon

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1983

► Milestones

Apple IIe debuts
MIDI unveiled to public
IBM PC-XT debuts
DASH format announced
Beta HiFi debuts

► Beginnings

Acoustic Sciences Corp.
Antex
Juice Goose
RPG Diffusor Systems
Steinberg

► Anniversaries

25th—Gotham Audio (now
GPrime Ltd.)
20th—Philips Cassette debuts

The \$14,500 price included a 96KB RAM computer with a green phosphor CRT.

After 25 years of building calibration and instrumentation mics, Brüel & Kjaer entered the studio market with the 4003, 4004, 4006 and 4007—four new mics designed specifically for studio and location use.

Yamaha introduced the DX7, bringing FM synthesis to the masses. Over the next four years, 200,000 DX Series units were sold worldwide.

At AES in New York, Sony, Matsushita, MCI and Studer announced the DASH (Digital Audio Stationary Head) standard for digital multitracks. The standard called for 2-, 4-, 8-, 16-, 24- and 48-track formats and was compatible with Studer and Sony recorders already in development.

Those on smaller budgets were interested in the Fostex B16, the first ½-inch, 16-track—retail was an affordable \$5,900. And dbx began shipping its Model 700 Digital Audio Processor, which like the PCM-F1 and PCM-1610, stored audio on videotape. However, the Model 700 used Companded Predictive Delta Modulation rather than Pulse Code Modulation and sampled at a rate of 640 kHz.

Soundcraft unveiled the TSR-24, its first in-line design, while Soundtracs' CM-4400 was the first compact console with an onboard microprocessor.

In a packed demo room at AES, visitors marveled to the sounds of the Kurzweil 250, the first ROM-based sampling keyboard to successfully reproduce the full complexity of acoustic instruments, with natural-sounding pianos, thick drums, lush strings and choirs, and more. It was almost \$16,000, and it sounded great.

1984

The Macintosh

Thankfully, Orwell's Big Brother didn't arrive in 1984, but Apple's innovative halftone commercial during the Super Bowl telecast announced the Macintosh, a 128K, 8MHz machine with a 68000 processor. Retail: \$2,500, including built-in 9-inch monitor.

CD players were originally hailed by Sony as "perfect reproduction," yet somehow, a year after their release, improved second-generation hardware designs were unveiled. DADC, the first U.S. CD plant, opened in Terre Haute, Ind.

Previously known only for its consumer hi-fi gear, Akai entered the M.I. market with the MG1212, a 12-track analog recorder/mixer that recorded on proprietary ½-inch cassettes. The format showed up later in a rack-

successful, although actually creating samples on the unit proved nearly impossible for the do-it-yourselfer.

Speaking of sync, Nagra joined the timecode revolution and announced the Nagra IV-S TC—essentially a version of everybody's favorite location recorder equipped with a center-track timecode head and onboard SMPTE reader generator. A dozen years later, it's still the industry standard.

The fall AES offered more tools for cost-effective production, such as the Tascam MS-16 1-inch, 16-track and the Amek/TAC Scorpion 8-bus console. Available in two frame sizes, with up to 32 or 40 channels, Scorpion sounded great, was built like a tank and priced under \$6,000. *Lots* of these would appear in studios and venues over the next few years. Maybe it was the name...

Nineteen eighty-four was also a year that saw plenty of buzz about



1984: E-mu Emulator II (shown here with Digidesign's Sound Designer sample editing program, which arrived a year later)

mount, recorder-only version. Neither was successful.

In musical instrument technology, E-mu Systems introduced the Emulator II, which in terms of sound quality, flexibility and processing power was light-years ahead of its predecessor. It retailed at \$7,995, and, over the next four years, the EII and other E-mu products become standard fixtures in studios everywhere. The EII was followed in 1988 by the EIII (16-bit sampler) and in 1994 by the Emulator IV—the first sampler with 128-voice polyphony. E-mu eventually capitalized on its digital audio expertise with the Darwin, a stand-alone 8-track (expandable) disk recorder/editor.

MXR Innovations ceased operation. A year later, the company's principals went on to form two separate companies: Alesis and Applied Research & Technology (ART).

Later in the year, Ensoniq launched Mirage, the first mass-market sampler. At \$1,700 and backed by an excellent library of sounds, it was highly suc-

cessful, although actually creating samples on the unit proved nearly impossible for the do-it-yourselfer. Although it wouldn't ship until 1986, AMS previewed its AudioFile workstation. It's still in production today, which must be some kind of record in a world where the half-lives of digital products seem to be measured in nanoseconds.

1984

► Milestones

Apple Macintosh arrives
First U.S. CD plant: DADC,
Terre Haute, IN

► Beginnings

Akai M.I. Division
Alesis
ART
Carver (Phoenix Gold)
MMA
Velodyne Acoustics

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World Radio History



1985: Dave Harrison (with arms folded) debuts the Series 10.

1985

Enter SoundDroid

Atari launched its \$600 520 ST computer. With a half-meg of RAM, color graphics and mouse, it was the first serious computer from a company known mostly for games. But its built-in MIDI ports made the 520 ST attractive to software developers in the emerging MIDI music software market and with their customers—especially in Europe, where Macintosh computers were *very* expensive. With the ar-

rival of the 1040 ST (1MB RAM), a new platform was born.

A group of Tektronix engineers formed Audio Precision, and the new company showed its System One, a PC-based audio test system, three- to ten-times faster than other systems on the market. System One soon became an industry standard.

Lucasfilm and Convergence Corp. formed The Droid Works and, under the design leadership of Andy Moorer, unveiled the SoundDroid™ workstation at the 1985 NAB show. Offering picture interlock, multitrack recording, sound synthesis, editing, mixing dynamics control, reverb and effects from a slick interface of touch-sensitive graphics screens, soft-keys, assignable knobs, moving faders and shuttle wheel, it was a spellbinding technological achievement. A year later, commercial systems were offered to the public, but The Droid Works' true workstation approach to sonic manipulation was years before its time, and none were ever delivered outside of Lucasfilm. The company folded a few years later.

Alesis and ART showed the first under-\$1,000 digital reverbs: The ART

DR2 was based on the MXR 01a, had seven room types and was priced at an attractive \$995; months later, Alesis unveiled the XT Reverb (\$795) with two programs. The days of affordable DSP had finally arrived...

Digidesign introduced Sound Designer, a program that allowed editing and manipulating of samples from an E-mu Emulator II using a Macintosh computer. The program also offered FFT analysis, digital EQ/mixing/compression, FM and waveshaping synthesis, and waveform redrawing using a mouse. Years later, Digidesign would bundle Sound Designer software with



1985: Droid Works SoundDroid



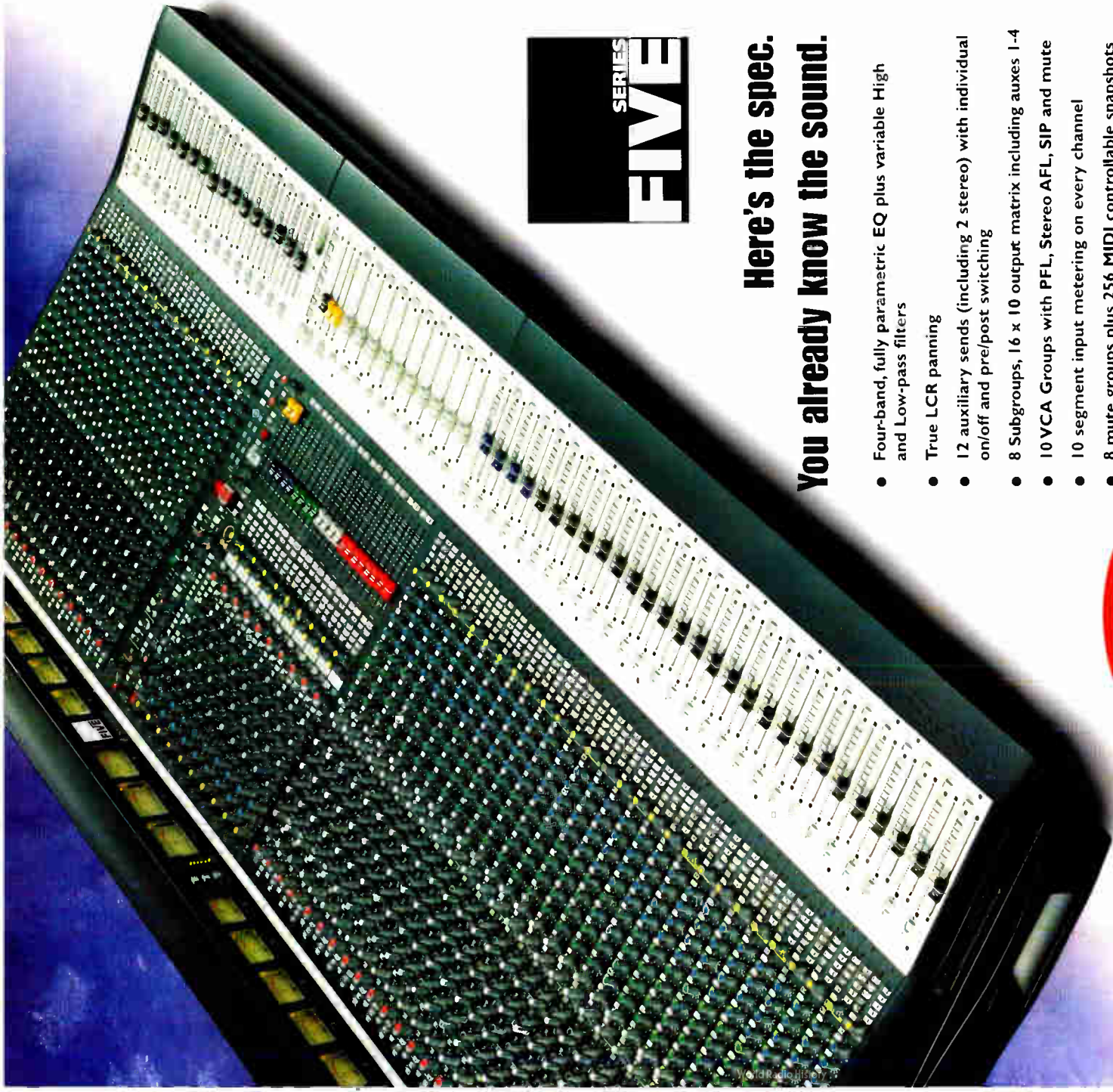
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CIRCLE AD NUMBER ON PRODUCT INFO CARD

1985

► Milestones

Atari ST launched
First under-\$1,000 digital reverbs

► Beginnings

Apogee Electronics
Audio Precision
Cooper Sound Services (Cooper Sound Systems)
Droid Works
Korg USA
Manhattan Production Music
Music Industries Corp.
Opcode Systems

► Anniversaries

50th—BASF/AEG Magnetophon (first tape recorder)
25th—Sony's first U.S. operations
25th—Cetec Vega (Vega)
25th—Korg Inc.

its hardware for the Mac II family of computers and call it Sound Tools.

Ten thousand audio pros packed the New York Hilton for the fall 1985 AES show, and it was a whopper! To counter the growing DASH recorder market, Mitsubishi, Otari and AEG joined forces and announced the PD (ProDigi) standard for 32- and 2-track recorders. Otari's DTR-900 came out a year later.

Calling it "the world's first totally automated console," Harrison unveiled the Series 10, a digitally controlled analog mixer with SMPTE-driven moving fader automation and instant re-configuration of all levels, pans, EQ, dynamics and signal routing. Over the years, it would be refined into the Series 12, still in production today.

On a slightly less grand scale, another major console debut at AES was Yamaha's PM3000; both it and the later PM4000 would become standards in live and concert sound work for years to come. Another perennial workhorse to come out of AES was Lexicon's PCM 70 digital effects processor, which offered the most extensive MIDI manipulation possibilities of any outboard device available at the time.

1986

Digital or SR?

In January Apple debuted the Mac Plus, a 1MB computer with SCSI support and a 9-inch screen. Retail? \$2,600!

At AES Montreux in March, Mitsubishi showed the X-86 2-track and began delivering the second-genera-

tion X-850 digital 32-tracks. However, Dolby stole the show by announcing Dolby Spectral Recording (SR), a process designed to improve the quality of analog recording. The SR hardware was pricey (\$750/channel), but it suppressed modulation noise and provided a dynamic range exceeding that of 16-bit digital systems, giving analog fans something to smile about. Studer later showed its A820 top-of-the-line analog 24-track, which included on-board slots for Dolby A or SR cards.

Yamaha hit a home run with its SPX90, a programmable effects processor with 30 preset sounds and 60 user slots. At \$745, it became standard in touring and studio racks for years to come.

After years of development, AMS delivered AudioFile, a disk-based recording/editing system. Built into its front panel control surface was a monochrome CRT, 13 user-definable soft keys, dual thumb wheels and a QWERTY keyboard. Retail was in the



1986: Lexicon CEO Ron Noonan introduces the Opus.

\$40-50k range, depending on options and storage needs.

In June, Intel shipped its 386 processor, finally putting some punch under the hoods of PCs.

Trident showed the Di-An digitally controlled analog console. Its assignable design included features such as storage for four EQ settings per channel and a slick "auto gain" function that automatically set preamp gain during run-throughs. Sales were dismal; Di-An never became the success it should have been.

Akai's S900 sampler was 12-bit, but its affordable price (\$3,295), quality audio and great library (which later grew to mammoth proportions) appealed to the musician/studio market, while the post-production community loved it for effects triggering.

Rupert Neve founded Focusrite to develop high-performance circuits, beginning with the ISA range equalizer and mic preamp modules. Focusrite

eventually developed large consoles based on the modules and continued with its acclaimed Blue and Red Range outboard processors.

Otari's MX-80 is a 2-inch analog recorder, designed for the smaller facility or home/project studio market. It was available as a 24-track, but the 2-inch, 32-track version spawned a new format.

Founded by engineer Bruce Jackson and former Soundcraft U.S. president Betty Bennett, Apogee Electronics debuted at AES with its 944-G and 944-S filters, which improved the performance of digital recorders. Within a year, Sony approved the use of Apogee filters in its PCM-3324. Otari followed, and Mitsubishi offered the filters as a factory option. Apogee later offered a Low-Jitter Clock module and a popular line of outboard converters.

Lexicon unveiled Opus, a disk-based, 16-bit, digital 8-track recorder/editor with a hardware mixer and, no surprise, extensive signal processing capabilities. It was a stunning achievement, but the staggering development costs of the system eventually put an enormous financial strain on the company. Years later, after focusing its efforts solely on signal processing, Lexicon recovered and prospered.

Soundtracs' PC-MIDI console was the first mixer to feature MIDI-based mute automation. More upscale (a *lot* more upscale) was Neve's first V Series board, a 48-bus console featuring Neve's Formant Spectrum EQ, Master Status controls for input/output/fader setups, split or in-line operation, eight mono/four stereo aux sends and optional Necam 96 moving fader automation. The V Series was enormously successful and became the cornerstone of Neve's high-end analog designs for years to come.

1986

► Milestones

Dolby SR introduced
R-DAT spec announced

► Beginnings

AKG acquires Ursa Major
AudioControl Industrial
JBL acquires Soundcraft
Mackie Designs Inc.
Focusrite
Sabine
Sonic Solutions

► Anniversaries

50th—Telex
25th—Gold Line

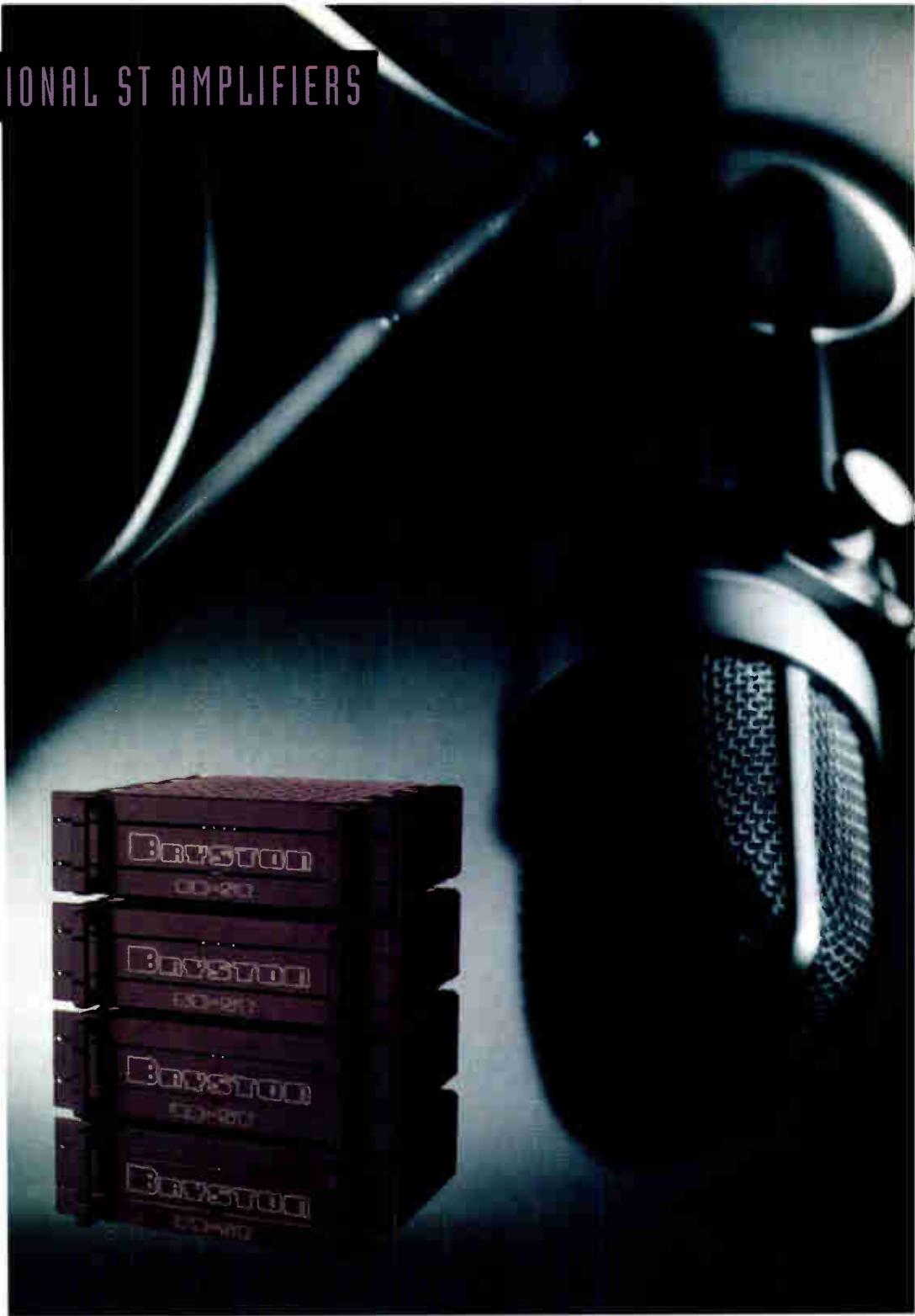
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approaches, such as a fixed sampling rate architecture, which permits pitch changing of sounds without affecting the sampling rate.



1988: The Euphonix Crescendo arrives.

1988

DAT Settles In

No consumer DATs were officially delivered Stateside, due to the RIAA's attempts to legislate requirements for copy-code circuits in DATs to prevent the duplication of copyrighted material (i.e., CDs). However, DATs that were deemed "professional" were allowed into the country. CBS later encouraged the adoption of a copy-protection system based on a deep (but narrow-band) notch in the upper midrange—effectively a "slice" out of the music—but a National Bureau of Standards study found it audibly unacceptable.



1988: A-DAM, the first MDM.

At Paris AES, Akai unveiled its A-DAM (Akai-Digital Audio Multitrack), which stored 12 tracks on 8mm videotape in an 80-pound, rackmount chassis. A-DAM was the first machine to use the modular digital multitrack approach, whereby multiple A-DAM transports could be slaved for 24- or 36-track operation. It was priced at \$30,000+, but compared to the \$100,000+ prices on reel-to-reel digital machines, A-DAM was an affordable alternative.

A new standard was launched: the MIDI digital transfer protocol for carrying up to 56 channels of digital audio between two devices. The amazing thing about MIDI was that rivals such as Neve/SSL and Sony/Mitsubishi took the initiative upon themselves for the good of the industry. It doesn't happen often enough.

Yamaha's DMP7D (\$5,995) was a digital I/O version of the popular DMP7 mixer, with optional outboard converters for transferring from/to DASH/PD/AES/S-PDIF. Upon its release in 1988, *Mix* asked the question: "So when will Yamaha release the 56-input version of the DMP?" Seven years later, Yamaha responded with the 02R.

Panasonic debuted its SV-250 (portable) and SV-3500 (rackmount) DAT machines for the pro market. Both were essentially modified consumer decks but went on to become best-sellers. A few years later, the SV-3500 was replaced by the SV-3700—Panasonic's first "real" pro deck—which became one of the most common DAT models in studios.

Tandy announced the THOR erasable CD system, with the promise of under-\$500 CD recorders and \$25 media. It was absolute vaporware, impossible to do based on 1988 technology, and never went anywhere, but lots of press about THOR caused CD player sales to plummet as millions of consumers postponed buying systems until the "recordable" ones came out.

Digital was THE buzz word at the fall AES show: AMS launched its digital mixer series with the Logic 1, which could be used alone or incorporated with an AudioFile for a complete digital domain workstation. Integrated Media Systems debuted Digital Dyaxis, a hardware-software system that combined with a Macintosh to form a 2-track recorder/editor. Eventually, Dyaxis took a sizable share of the stereo workstation market and then expanded into full-blown multitrack system with disk-based video.

Sony began shipping PCM-3348 48-track recorders, employing thin-film heads to put 48 tracks on the same 1/2-inch tape used on 3324s. As the 48-track machine could play back tapes made on 24-track DASH recorders, projects could be started on a 24-track machine and finished on a 48-track system for access to tracks 25-48. The machine was \$240,000, but sales took off like a rocket.

Euphonix, a young start-up compa-

1988

► Milestones

Akai A-DAM: First MDM
MADI standard proposed

► Beginnings

Audio Technology
(Audio Toys Inc.)
CAD Professional
Microphones
Cedar Audio Ltd.
Doremi Labs
Euphonix
THAT Corporation

► Anniversaries

25th—Yorkville Sound

ny, showed up at AES with its first Crescendo console. The prototypes were rough, offering Macintosh, Atari(!) and PC-AT interfaces for viewing, editing and storing automation data. However, the approach of combining a digitally controlled analog mixer with a central control area—where equalization, panning and aux sends could be manipulated without leaving the sweet spot—and onscreen displays of EQ curves was right on the money. In years to come, Euphonix rose from obscurity to become a major player in the console market.



1989: Mackie CR-1604

1989

Digidesign, Meet Mackie

January 20, 1989: Nobody knew just how significant this day would turn out to be, as Digidesign unveiled Sound Tools, a Mac-based (SE or Mac II) system for digital recording and editing. Sound Tools combined hardware boxes (outboard converters and DSP) with its Sound Designer II software, and at \$3,995, was just the ticket for editing tracks on those DAT machines that were showing up in studios everywhere. Eventually, Sound Tools was replaced by Digi's Audio-

media series of plug-in cards (still in production); the SD II file format became a worldwide standard, and Digidesign became the leading provider of workstations.

Bring on the low-cost mixers: Alexis previewed its Model 1622, a 16-channel unit that used "Monolithic Integrated Surface Technology" to achieve a breakthrough \$799 price. Six months later, Mackie Designs—a new company formed by the founder of

Tapco—responded with the CR-1604, another 16-channel design but in an all-metal chassis with an internal power supply and seven aux sends per channel. Deliveries didn't begin until much later, but the 1604 created a buzz that continues to this day.

Seeing the growth of the project studio as a threat to established businesses, a group of commercial facilities in Los Angeles formed HARP. The association lobbied for tougher enforcement of zoning regulations in order to hobble what they saw as unfair competition from unlicensed studios.

SSL unveiled ScreenSound, a multi-track disk recorder/editor and mixer designed for post-production, with on-board machine control of ATRs, VTRs, dubbers, laserdiscs and Quantel Harry systems. Functions were accessed via a pen/tablet interface.

With the introduction of the AT4031 and AT4051 studio condenser microphones, Audio-Technica began its move out of the *milieu* of garage band mics and into the realm of serious professional tools.

Thanks to the PC, acoustical tools became more affordable: DRA Labs

MLSSA provided loudspeaker assessment, reverb time/decay, intelligibility analysis, energy-time curves and more—all from a \$2,500 system (not including required 640K PC XT/AT).

Yamaha showed its DMR8, which combined a digital 8-track (expandable to 24-tracks) recorder and digital mixer with onboard signal processing. Its \$30,000 price and proprietary stationary-head digital cassette formats prevented the unit from widespread acceptance, but its sparkling 20-bit reproduction was years before its time.

1990

Analog Rebirth

The talk of Winter NAMM was Opcode's Studio Vision, a digital audio sequencer that combined the MIDI sequencing of Vision with the digital audio capability of Digidesign's Sound Tools.

After many delays, Studer finally unveiled its D820-48 digital 48-track, expanding the growing dominance of the DASH format.

The hottest demo at AES was hearing the CEDAR (Computer Enhanced

1989

- **Milestones**
 - Digidesign intros Sound Tools
- **Beginnings**
 - Anthony DeMaria Labs
 - ATM Group (ATM Fly-Ware)
 - GLW Acquires Harrison
 - HARP forms
 - Mackie CR-1604 debuts
 - Zoom Corp.
- **Anniversaries**
 - 65th—Celestion
 - 20th—Solid State Logic
 - 20th—Tascam
 - 15th—Wireworks

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1990: High-output tapes and Dolby SR bring analog to the cutting edge.

Digital Audio Restoration) process perform real-time de-clicking, and scratch and crackle removal from a beat-up

Paul Robeson 78.

Digital may have grabbed the headlines, but analog kept on improving. A new format was born: 1-inch, 24-track recorders incorporating Dolby S noise reduction were shown by Fostex (G-24) and Tascam (MSR-24S).

3M demonstrated its high-output 996 tape formulation, capable of +9dB operating levels with a S/N ratio of 79.5 dB. With the availability of better noise reduction—such as Dolby SR—and high-output tape formulations from 3M (followed by Ampex and BASF), producers and engineers began to re-examine the benefits of analog recording.

1990

► Milestones

Sony introduces writable CD
Philips announces DCC

► Beginnings

Aardvark
Digital Audio Labs
Digital Domain
Harman purchases DOD/DigiTech
WhisperRoom

► Anniversaries

10th—Crown PZM mics

1991

Bring on the MDMs

January 18, 1991: A surprise unveiling at winter NAMM would forever change the course of pro and semipro recording. The product was the Alesis ADAT: Capable of recording eight tracks of digital audio on inexpensive S-VHS tapes, it could be interlocked with other ADAT units to provide up to 128 tracks. Even more impressive was the original \$3,995 price tag.

Although ADAT was still 14 months away from delivery, it had the effect of immediately bringing analog 8-track recorder sales to a halt. Affected most by the advent of ADAT, Tascam and Fostex began their own MDM devel-



1991: Alesis ADAT

opment projects. No one could have predicted that Alesis would eventually sell 100,000 ADATs, but digital multi-tracking was no longer the realm of the rich and famous.

In April, Skywalker Sound began using Dolby AC-2 coding to transmit audio over T1 lines between its Northern and Southern California facilities, 450 miles apart. ADR would never be the same.

Spatial expansion and 3-D audio systems began catching on. The BASE (Bedini Audio Spacial Environment) had been in use for over a year; Roland was shipping its RSS system; QSound (offered on a royalty basis) had been used on projects from



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CIRCLE AD NUMBER ON PRODUCT INFO CARD



1991: Digidesign's Pro Tools

Madonna and Sting. Eventually the craze wore off, and spatial effects such as QSound software and Spatializer (which debuted later) became tools for occasional use, rather than abuse outlets for those in the "let's use this on everything" camp.

In exchange for ending digital manufacturers' opposition to the RIAA's proposed home taping royalties on digital gear, hardware manufacturers were mandated to include SCMS (Serial Copy Management System) on all consumer DAT decks. Professional gear was exempted, yet SCMS was included on some pro recorders, as some manufacturers feared litigation if consumers bought pro machines to

avoid SCMS. Ironically, by this time, DAT was considered a failure as a home format, and the net effect of SCMS was to make it difficult for bands working on home digital equipment to create backup copies.

Responding to the growing project studio market, interest in near-field speakers took off. Tannoy enjoyed steady sales of its entry-level PBM-6.5 and PBM-8 models, and an influx of new monitors hit the streets, including the Audix MM5, Bag End ELF, Dynaudio PPM1, Electro-Voice S-40, JBL 4200, KRK Model 9000 and Peavey PRM-308. Perhaps prompted by the success of the 1991 Meyer HD-1s, a growing number of compact, high-performance powered monitors appeared, including the Genelec 1031, Quested 108 and Westlake BBPM-4. Today, there are dozens of powered reference monitors available.

Meyer Sound debuted its SIM* (Source-Independent Measurement) System, a revolutionary acoustical measurement technology. The result of an eight-year R&D effort, SIM took advantage of emerging low-cost, 32-bit floating-point DSP and 486 PC processing to analyze acoustic spaces dur-

ing live performances with an audience present, using either music or voice as the test signal. It was unlike anything else on the market.

Digidesign made a giant step with Pro Tools, a Mac-based system that integrated multitrack digital audio recording/editing, DSP, MIDI sequencing and onscreen digital mixing. The platform supported 4 to 16 independent I/O channels, analog and digital I/O and SMPTE sync. Systems were

1991

► Milestones

Sony develops MiniDisc
Alesis ADAT introduced
3M intros high-output analog tape

► Beginnings

Acoustical Solutions
Level Control Systems
Millennia Media
SADiE
Sonic Foundry

► Anniversaries

20th—Lexicon/Gotham Delta
T-101: first commercial digital audio product

—CONTINUED ON PAGE 118

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CIRCLE AD NUMBER ON PRODUCT INFO CARD

Lead Vocals



The background of the page is a warm, yellowish-gold color. Overlaid on this background are two horizontal staves of musical notation. The notes are dark brown or black, and the staves are thin, dark lines. The notes are scattered across the staves, creating a sense of movement and rhythm. The overall aesthetic is that of a vintage or classic music-themed publication.

Twenty Who Saw It All

By Hillel Resner

How does one go about picking 20 people

to represent the voices of change and progress in the recording industry over the past 20 years? Our industry has such a wealth of experience that you could probably pick 20 people for each year without too much difficulty. So we established some criteria to select our 20 subjects: First, they had to have strong opinions about things, and not be shy about expressing them. Second, they had to have had a special relationship with *Mix*, preferably dating back to early in the magazine's history—like Chris Stone, whom we first interviewed in our fourth issue, or Phil Ramone (issue 15), or Dave Angress, who was an audio retailer in San Francisco when *Mix* was a tabloid. Beyond that, they only had to have the time and willingness to answer a couple of questions.

We asked our subjects what changes in the audio industry during this time have had the greatest effect on their work, and in what way. We also asked them to tell us about a memorable experience they've had during the past 20 years. For reasons of space, we couldn't use everyone's answers to both our questions, but what we present here are pretty good snapshots from some eyes that have seen a lot!



David Angress

Dave Angress goes way, way back with The Mix. As manager of Sound Genesis in San Francisco, one of the first successful pro audio retailers, Angress needed

to get the word out. When The Mix came along, he immediately saw its value, and gave the magazine support when it needed it—in encouragement as well as advertising. Since then, Angress has built a successful career in sales and marketing with a number of leading audio companies, including AKG, Harman Pro Audio and Guitar Center, where he currently serves as vice president driving its pro audio, keyboard and computer business.

"In those days it was a bunch of really small businesses, and the products came out of engineering solutions to very specific customer needs. It really wasn't built on any kind of business model, and it wasn't built on any kind of sound financial model, either. It was just a bunch of regional guys in a small community, making things happen together. And then it began to

real business underpinnings to it, and it's subject to all the same influences—positive and negative—that our entire global economy is subject to.

"Unfortunately, we do end up with some of the big business financial pressures slowing down product introductions and innovations, because big companies tend to start doing what's 'safe.' Happily, we still have those people who remember why we got into it in the first place and are still designing great products that support the music."

Betty Bennett

Betty Bennett first joined the audio industry in 1980 as receptionist/bookkeeper at the original offices of Soundcraft Electronics in Kalamazoo, Mich.



By 1984, Bennett had become president of Soundcraft U.S., overseeing the growth and acceptance of the British console manufacturer's products in the American market. In 1986, following Soundcraft's sale to Harman, Bennett, with Bruce Jackson and Christopher Heidelberger, founded Apogee Electronics, which has since become the premier manufacturer of A/D and D/A converters.

"Some of the biggest changes affecting my work have been the ways in which we communicate. We've gone from letters and telexes to fax and e-mail!

"In our industry, over the past 20 years, we've seen large, analog-based manufacturers caught out because they didn't have a digital division. Now digital has hit, and hit hard. Digital requires a whole new thought process. You can't just pull a group out of the blue; it has to be a mature team.

"Equally, companies that got into digital early ran into difficulties. The projects were so large, the time to market was so long and the technology moves so fast, that the resulting products were superseded virtually as soon as they were released. They were often too expensive and outdated."



Betty Bennett

Hal Blaine

Known with justification as "the world's most recorded musician," veteran drummer Hal Blaine has logged more studio hours than most tape recorders. His 50-year career has spanned every rock era and included sessions with everyone from Elvis Presley and the Beach Boys to John Denver and Frank Sinatra. Today, Blaine is still on the road and in the studio, most recently touring with mandolinist David Grisman, recording with a new band, Pink Noise Test, and others. His biography, Hal Blaine and the Wrecking Crew, was published by MixBooks in 1990.



"Twenty years ago was just about the time electronics were coming in—electronic drums—and a lot of guys started going to electronic music. And what happened was that a lot of people, to this day, are strictly using computers. They've got all the MIDI stuff and, and the CD-ROMs with all the drums and all the guitars and all the instruments—and that's how they're



Angress sans specs

grow, with significant growing pains, into a real industry, and all the pressures you would have in any industry came to bear: financial issues, technology issues, how can you manufacture it better to get the cost down—all that stuff. And we're at a point now where obviously, it's a global industry. It's got



Hal Blaine on the stand



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doing an awful lot of commercials today. And commercials were probably my favorite thing to do, because you went in and worked for an hour and got paid for several years after that! We used to do three, four, five commercials a day with Don Piestrup—and fortunately, whenever they do anything major or big band stuff, where they bring in live bands, he's still calling me. And from the time Herb Alpert and Jerry Moss started Alamo Sounds, about three years ago, they had a certain number of people who they signed that had electronic records, and they brought me in to put live drums on the electronic records."



Randy Ezratty

A "road warrior" since the early '70s, Randy Ezratty started his career in Los Angeles as an assistant to the legendary Paul Buff, then moved to Nashville as part of the original Allison Research team. After working for several years as a roadie and/or live sound mixer, in 1980 he started Effanel Music with the (then novel) concept of portable 24-track remote recording. Since then, he has recorded Peter Gabriel, Paul Simon, Bruce Springsteen, Sting, Tina Turner, U2 and countless other artists. His "crowning achievement" is L7, Effanel's new, expandable Neve Capricorn mobile recording studio.

"The biggest change in our industry has been the increased availability and economic viability of technology to the masses. You no longer need to be a seasoned professional to make decent recordings. This has been a mixed blessing. It pleases me that

some great music, which would have gone unrecorded in the past, is now being captured. But, unfortunately, many artists have lost the desire to discern between great and simply adequate recording techniques.

"My favorite project was Paul Simon's *Graceland Live*, recorded in Harare, Zimbabwe in 1987. The combination of musical, cultural and social treasures that came together in one place and on one project reminded me why I chose to make live recordings."

Mark Gander

JBL Professional has seen a lot of changes over the years since Mix was founded, but one thing has stayed the same: the genial and thoughtful presence of Mark Gander. An electrical engineer by training and a sound reinforcement mixer in his own right, Gander has brought both creative imagination and soul to the world's leading loudspeaker manufacturer. Starting out as a transducer engineer, Gander served as VP of both engineering and marketing before assuming his current post as VP/strategic development. Along the way, he has given a lot of helpful advice and support to both Mix and the TEC Awards. Thanks, Mark.

"In the '60s and '70s, technologies such as multitrack recording and synthesizers were exceedingly expensive and complicated. Only skilled engineers and the highest levels of creative artists could afford access to, and were able to take advantage of these tools. Technological developments, together with manufacturers both responding to and creating market demand, have greatly broadened access to these technologies.



Mark Gander at the bench

"In my specific field of loudspeakers, there really haven't been any revolutions, only evolutions of the basic concepts developed back in the '20s and '30s. We sometimes break up the audible spectrum into a few more ranges than we used to, and we take advantage of newer materials to reduce distortion and weight, but the basic physics and acoustic principles haven't changed. We've yet to find a radical new way to generate sound fields that doesn't also come with an unacceptable penalty in distortion or fidelity.

"The greatest potential for the future is in digital electronic control. The advent of analog processed systems in the 1980s indicated the improvements possible by more closely integrating the complete electro-acoustical transduction system. As sophisticated digital signal processing inevitably becomes more affordable, innovations such as wavefield synthesis, beam steering and flexible directivity control will become broadly available."



Randy Ezratty with Mick Fleetwood



Herbie Hancock

One of the most accomplished and inventive musicians of his generation, keyboardist Herbie Hancock's career is a virtual chronicle of the developments

in music technology over the past 25 years. Already firmly established as a jazz giant, his electronic explorations of the 1970s and '80s achieved a vast audience and helped legitimize synthesizers and sequencers as instruments of creative expression. At the 1994 TEC Awards, Hancock received the Mix Foundation's Les Paul Award for the creative application of technology.

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Herbie Hancock

"The obvious change is digital technology. That changed everything. As far as instruments are concerned, what made the switchover was the Yamaha DX-1. That was the first real digital instrument...The first digital instrument I had was a plug-in to the Macintosh, called the Alpha Centauri. As a matter of fact, I and Steve Wozniak were on the board of directors. Then, when the DX-7 came out, they folded the company. Then, little by little, all the other instruments started to become digital—even the Fender Rhodes became digital eventually.

"Before MIDI came in, Brian Bell and I had a lot of stuff built to be able to have analog instruments talk to each other. And we were also involved in making sequencers, before MIDI came in. I remember actually using some of the stuff that we worked out, with the help of E-mu, so that I could do sequences on this keyboard, which had memory. On one of my records, called *Monster*, there's one tune that Santana played on, called "Saturday Night." In the middle of it there's this kind of Latin brass ensemble thing, and I had programmed this sequence in there to play all these instruments...I'd start a sequence by hitting the key command, and once that started I'd hit the key command for the next sequence, and they would follow seamlessly—and that was a new thing. I had done all that in my [home] studio, and when it came time to record I took all my instruments to this recording studio, and when it was time for this thing to come on, I pushed this command and sat back and watched it play. And the engineer, Fred Catero, his eyes bugged open—he couldn't believe it."

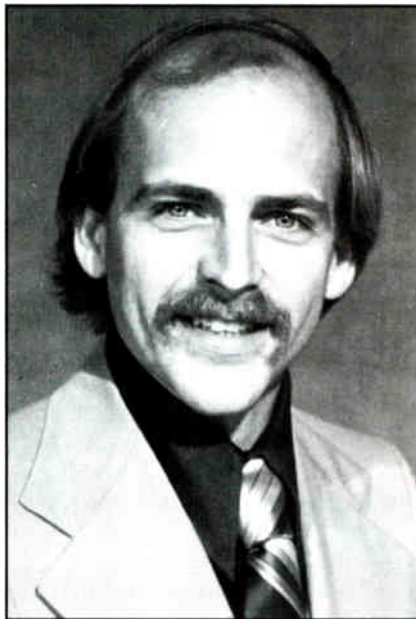
Christian Haseleu

Chris Haseleu is associate chair of the Recording Industry Department at Middle Tennessee State University, one of the oldest and most respected programs of its kind in the country. Before joining MTSU in 1978, he worked as a mastering engineer at GRT Records. In the late '70s and early '80s, Haseleu also co-wrote (with Dennis Buss), a column on studio operations for an obscure West Coast magazine called The Mix.



"Without a doubt, the change that has had the biggest effect on my work has been the acceptance by the industry of the need for education in audio. Twenty years ago, there was only a handful of programs that covered the recording industry; the first *Mix* education listings, in 1981, showed less than 80 educational opportunities. Now, the *Mix Master Directory* has over 350 listings in its education section. In my case, the program I joined in 1978 with 60 students now has over 1,100!

"Over the past 20 years, I have been involved in the design and construction of four different recording studios. My favorite was the second project, which was a small mixing control room. Because it was a fairly small project, and because it was being paid for by funds from a center of which I was the director, I had the opportunity to get very involved in every aspect of the design and con-



Christian Haseleu

struction. I worked closely with Bob Todrank, the designer, and together we built a really fine-sounding room. This room, completed in 1987, has been used to train hundreds of students, many of whom are working in the industry."



Leslie Ann Jones at the board

Leslie Ann Jones

A recording and mixing engineer for over 20 years, Leslie Ann Jones began her career in Los Angeles, and in 1975 moved to San Francisco to join the staff of The Automatt. There she worked with such artists as Herbie Hancock, Bobby McFerrin, Holly Near and Narada Michael Walden, and on the film score of Apocalypse Now. From 1987 to 1997, Jones was a staff engineer at Capitol Studios, where she worked with a wide range of top artists and on numerous films and television shows. Back in Northern California, she is now manager and mixer at Skywalker Sound's scoring stage.

"Digital audio has had the greatest effect on my work, both good and bad. *Bad* because of the proliferation of inexpensive digital formats that make recorded music sound, shall we say, not so good? And *good* because those formats seem to drive people to invent really good formats and converters! *Bad* because the inexpensive cost of technology has made it possible for the marketplace to be deluged with more music than it can support, and *good* because it's so flexible.

"It's hard to pick just one favorite project, but a more recent one was the first time I worked with Peter Matz, the

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CIRCLE AD NUMBERS IN THE BOTTOM LEFT CORNER

great arranger and orchestrator. I had been a big fan of his work since I was first introduced to it as a child by my mother. When I got a call at Capitol to engineer a new TV pilot, and the composer and arranger was Peter Matz, I was thrilled and a bit nervous. After recording one cue, Peter came in to listen, conferred with the director and walked out without a word to me. Later, after we were finished, I commented about this and he said, "Why should I say anything? It sounded like it was supposed to."



Al Kooper

From his classic riffs on Dylan's "Like a Rolling Stone," to his ground-breaking work with the Blues Project and Blood, Sweat & Tears, as well as the Platinum

hit Super Session, Al Kooper has helped to forge the history of progressive rock. Kooper has also made a name as a producer, with artists like Lynyrd Skynyrd, Was (Not Was), Nils Lofgren and B.B. King, and scored soundtracks for film and television. A recent resident of Nashville, Kooper is moving to Cambridge, Mass., to teach at Berklee College of Music.



Al Kooper

"I would say that the most important change that's taken place has to be digital mastering. It has helped me to realize my original vision all the way through to the consumer, unhampered by sonic roadblocks. Anyone who continues with analog mastering in this day and age has got to be misinformed or nuts!

"The most rewarding project for me in the last 20 years was the recording

of my last album, *Soul of a Man*. Ostensibly a fiftieth birthday party staged at the Bottom Line in New York City, it turned into a re-creation of the three bands in my life—Blues Project, Blood Sweat & Tears and The ReKooperators—with a total of 27 musicians participating. Like a musical autobiography spread out over two CDs, it tells my whole story in words and music, captured forever in the digital domain. The record company, in an unthinking moment, has condensed it down to one disc for re-release, but even that can't destroy the satisfaction of those original three nights in 1994."



Steve Krampf

A true industry visionary and a supporter of Mix from its earliest days, Steve Krampf, as the first Tascam representative appointed in the U.S. (1974),

was responsible for evangelizing cost-effective 8-track recording for musicians. From 1978 to 1986, Krampf was vice president of sales and marketing at Otari, where he introduced the popular MTR-90 24-track recorder. Since 1991 he has held the same position at Lexicon, where he has worked to expand the company's DSP base with the PCM 80. Articulate and soft-spoken, Krampf is also one of the best-dressed people in pro audio.

"First, the Tascam revolution, pioneered by Yoshiharu Abe, provided access and control of production equipment to a logarithmically broader base of people than in millennia before. While the high-end studios and suppliers initially 'freaked,' they later saw that the strong survived better than ever. After that came MIDI and the overall education effort; one needed the other for critical mass. The result was a generation of multitasking, multidisciplinary artist/producers that ended any delusions I had of a triumphant return to the studio as a music producer!

"The project or job that gave me the greatest personal satisfaction was working for Otari, doing something that most everyone said we did not have a chance to do, with the likes of Ampex, MCI, Studer and 3M in the marketplace. I enjoyed working with a company that was committed to supporting an insurgency into a market niche, as well as a high degree of customer satisfaction. And discovering my



Steve Krampf, 1982

art—identifying and leading both engineering and salespeople who wanted to make a significant contribution to the industry."

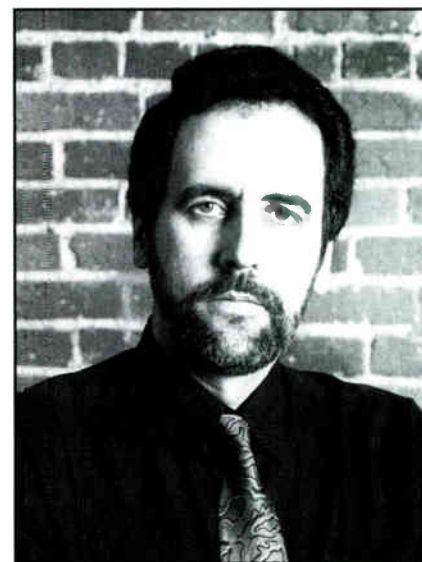
Mel Lambert

A pioneer of the audio industry trade press, writer and consultant Mel Lambert's 22-year career has included an eight-year stint as editor of Recording Engineer/Producer, as well as a lengthy association with Mix and other magazines as a



writer and contributing editor. Currently, in addition to writing, Lambert operates Media&Marketing, a consultancy service for the pro audio and multimedia industries.

"Dramatically improved means of communication, including desktop publishing and the Internet, have enabled people in our industry to become better informed about new tech-



Mel Lambert circa RE/P

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nical developments, thereby increasing their profitability and efficiency.

"For recording and production facilities, the biggest thing is the democracy of the technology that we have available now. It's both more affordable and higher-quality. And what we have are people who have the skill sets and can now use different tools to offer a wider range of audio production services to a wider range of clients. But it's all audio, it's all about getting the product finished, whether it's a wedding video with good sound quality or a full 5.1 DVD. People have to be more clever, but the tools are also there to make them clever.

"Joining the crew at *REP* in 1980 is an experience I will always treasure. I had visited the U.S. on several occasions during the late '70s, but I wanted to experience the culture up front and personal. At that time, Marty Gallay's book was the leading pro audio bi-monthly magazine, and I was honored

to be asked to come to California to edit the magazine."

Rose Mann

If you say "Rose" in the recording industry, you must mean Rose at the Record Plant. For 20 years, with only a couple of brief stints elsewhere, Rose



Rose Mann booking time

Mann has held things together at L.A.'s most famous studio, keeping the studios hooked and the clients happy. Rose's photo, a picture of her at the

console, graced the Plant's first listing in The Mix in February, 1978.

"There've been monster changes. First of all, the cost of equipment has gone through the roof, and every year we have to upgrade something. And every year it's what we call an extraordinary expense. If it's not a new board, it's new patchbays or new monitors or new amplifiers. I just spent \$25,000 for new carpeting. A place like Record Plant, it has to be run like a five-star hotel. I've got to keep it nice.

"The other thing is, records are made differently now. It used to be that there was one producer on an album, and there was one mixer. Now, you've got up to six or seven producers on an album, and that means six or seven engineers. And six or seven engineers usually means it gets recorded at six or seven studios—so the album's spread out all over town and you don't get the whole project.

"Also, engineers have got so much equipment that they come with now, and with all this technology it's gone from a one-hour setup for a mix date to a three-hour setup. A guy will come in with a bunch of stuff and it's not in

ignite your imagination... it's easy when you can finally hear what your hot-shot reference monitors are capable of... regardless of their size or power requirements.

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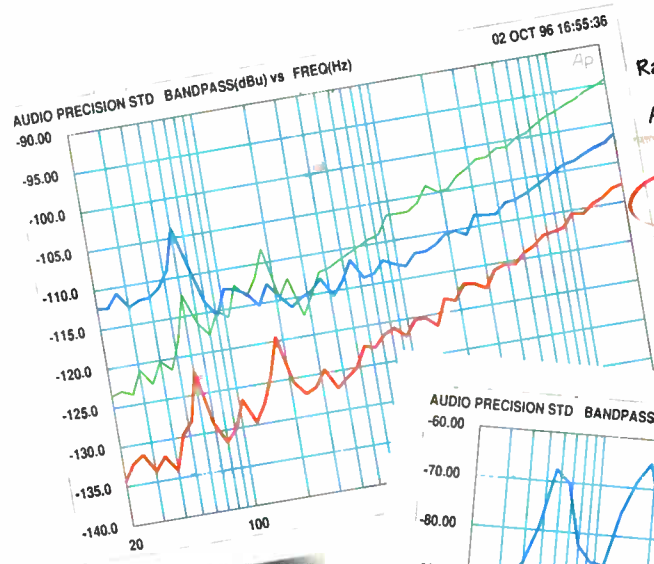
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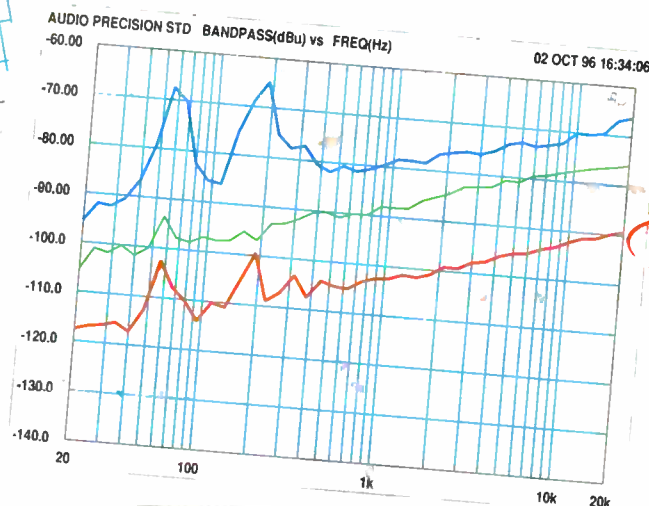


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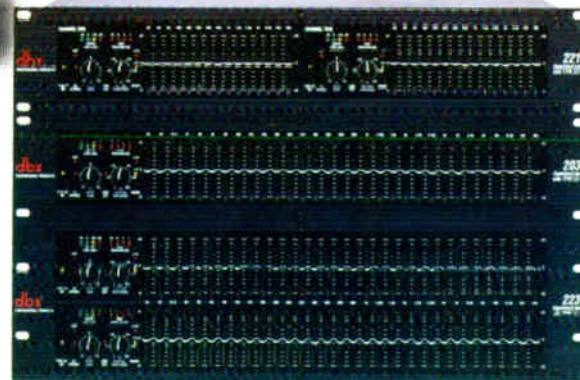
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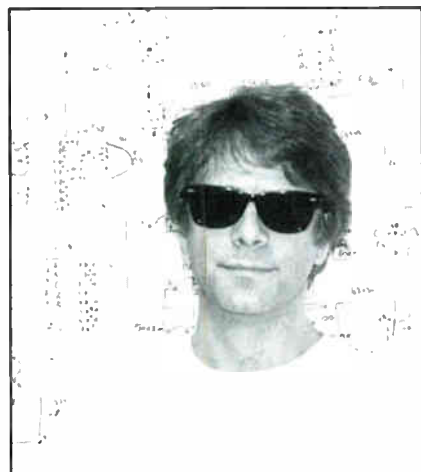
a rack, and he wants the studio to set it up. So do you swallow those three hours or do you bill it? I bill it!"

George Massenburg

Professional audio's Renaissance man, George Massenburg's 30-year career has encompassed nearly every aspect of the industry—from engineering and producing for records, film and television and designing and operating studios, to breakthrough electronic developments as the founder of GML Inc. A Grammy-winning engineer and a 1990 inductee to the TEC Awards Hall of Fame, he is as passionate about music as he is about technology.

"I think audio has sunk to a great low with the takeover of the CD, in the sense that we came from a great, warm and safe medium that made us want to go home and put on a record, and I don't love to put on CDs—I can't relax and listen to a CD...With the CD, another style of recording has emerged. It's extremely clear and dimensionless, but it doesn't have any depth, because CDs don't hold depth and detail. What I'm looking for is a step forward in resolution.

"I've gone back to recording ana-



George Massenburg

log, and I like it a lot better. What I'm trying to do is have some material that I can remix at 96 kHz—because right now, with 44.1, it's a brick wall; I can't come back and rework that in a couple of years when I want to remix a multichannel 96k master. That's one of the reasons I'm going back to analog—to have something that's wide-band and feels good.

"Technology is moving ahead very quickly, things are evolving very fast. But looking at history is a much bigger picture, and looking at the role of the artist in the 17th, 18th and 19th centuries, I don't see things being much different than today—that the artist is there to connect life to what is bubbling beneath the surface in all of us. These little voices in all of us take flight, they're illuminated by the artist who can really tell the truth. It's that connection with the sense of art beyond commerce that I think is important to get back to."

Hank Neuberger

The executive vice president and general manager of Chicago Recording Co., Hank Neuberger began engineering at CRC in 1976. He has worked with



"every great artist in Chicago" and won a Grammy for Tribute to Steve Goodman in 1987. A past national chairman of NARAS, Neuberger has supervised the Grammy telecast sound for the past seven years. A great communicator, he speaks as deftly as he engineers.

"MIDI and modular digital multi-tracks (ADAT, DA-88) have transformed the music and the business of recording it. On the plus side, more people in more places are recording more music than ever before. On the down side...don't get me started; at least we're still here!

"In 1980, Steve Goodman was producing his good friend John Prine for the first time. After recording and mixing the entire *Bruised Orange* album, I've always felt I was just lucky to be there for this indisputably great songwriter's (to me) greatest album. Being around two master songwriters taught me how writers treat their songs much like children, nurturing them carefully and fretting over letting them out into the world—a good lesson for every engineer."



Hank Neuberger—EQ this!

David Oren

A sage observer of both technology and people, David Oren has been an unofficial guru to Mix since the early '80s. A 30-year veteran of the audio industry, Oren served as sales and marketing manager for multitrack products at TEAC, introducing such innovations as the 3340 4-track recorder to the U.S. As product development manager at Tascam, Oren worked on the development of the first Portastudio, the 80-8, the first 1-inch 16-track, and multichannel mixer design and development. He has also worked in product development for both Fostex and Alesis. Doubtless, he has influenced your life as he has ours.



"Over the past 20 years, we've seen the development of new manufacturing processes and technologies that



David Oren

allow manufacturers to offer products at a fraction of their original cost in today's dollars. At the same time, the typical audio production system has progressed from microphones, a mixer and a recorder to one requiring provisions for MIDI and timecode synchronization, plus a mixer capable of handling the increasing number of electronic voices and other media sources.

"This evolution has made the job of product development and marketing more difficult, because companies now have to develop a broader range of products to suit the needs and sophistication of a broader spectrum of customers. While I want to add all the features and functions that the user

needs, the primary design goal is to develop products and technologies that enhance the creative process, with intuitive operation—that is, for technology to support art, not get in the way of art.

"I would have to say that it was more fun at the beginning of the 'multitrack revolution,' in a quieter and gentler time when companies and product concepts were developing. The personal rewards are just as great today, but in a 100-million-dollar company or a startup today, you can't do the things we did in a startup 20 years ago—like picking the color for the brand logo from a Sambo's menu!"

Alan Parsons

From his earliest days as an assistant engineer to George Martin on The Beatles' Abbey Road, Alan Parsons has lived on the cutting edge of recording technology. Catalpulled to fame for his engineering of Pink Floyd's *Dark Side of the Moon*, Parsons went on to record numerous best-selling records



for Al Stewart and others. In 1976, he founded the Alan Parsons Project, achieving a new level of renown as an artist. Since then, he has continued to break new ground as both an engineer and artist and has recently been touring in support of his latest album, *On Air*. In 1995, Parsons received the Mix Foundation's Les Paul Award for the creative application of technology.

"The most obvious change was the introduction of black boxes. Even when I was doing *Dark Side of the Moon* back in '72, there were no effects to speak of, other than echo chambers and tape machines. Every effect that you wanted to achieve was essentially created with a combination of tape machines and room acoustics. Then, suddenly, "bucket brigades" came along—that's what they called delay circuits back in those days. Suddenly we were able to delay sound without tape. And no sooner had that happened than somebody figured out



Alan Parsons (right) with Eric Woolfson

how to create a Doppler effect. Then we had chorusing, and then pitch-shifting. And I remember distinctly people saying, they'll never be able to achieve that—you'll never be able shift pitch in real time, that it could only be done by recording it first and playing it back at a different speed.

"Actually, at Abbey Road I worked with the very box that was used on *2001: A Space Odyssey*—the thing that slowed down HAL's voice when it was singing "Daisy," and I remember thinking, 'God, if this could only be a real-time process!' And a couple of years afterwards, it was."



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Phil Ramone

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his producer's magic on the greatest performers of our time—from Billy Joel, Paul Simon and Gloria Estefan to Barbra Streisand, Frank Sinatra and Paul McCartney. Ramone has always embraced technological change and has been a pioneer in digital recording, Dolby film sound formats and EDNet, among other milestones. He was inducted into the TEC Awards Hall of Fame in 1992.

"I think what people didn't understand, back when we were making analog multitrack recordings, and we went from tubes to transistors, what a major change that was. We lost warmth, we lost a lot of things. But on the other hand, we gained a differ-

ent phase of technology, and I think one of the keys to changes in technology is to make it work for you, rather than you work for it. Good mic technique has to be brought back into the 16-bit situation. And utilizing the room to make things happen for you, using proper reverbs, carefully attaching your EQ to what the final product is going to be. It's up to you to make it warm.

"I'm very much a believer in the fact that the next phase of engineer that I want to see is the more adventurous engineer. When the hard-edged hands came in, the ones that came in with the grunge sounds, they ignored



Ramone at the console

everything—and interestingly enough, some of their ignoring taught me a lesson. They were after the spirit of the record and not necessarily the technology. It goes back to a very strong point, which is that it's the music we're supposed to be worrying about."

Courtney Spencer

Currently the vice president of Sony Pro Audio, Courtney Spencer is a veteran of the audio wars. Originally an engineer and a producer of commercial music, Spencer cut his teeth in sales and marketing at Manhattan's venerable Martin Pro Audio, where he served as a VP/general manager for eight years. He later became VP of sales for Waveframe Corp., before joining Sony in 1990. There, he has helped to lead the company during a period of exceptional growth and technological development.



"On a broad level, a key change has been the introduction and the ultimate market acceptance of the CD as the industry-standard music carrier, leading to a gradual, and still ongoing, conversion to a digital audio production infrastructure.

"At the same time, the role of software/computer-based products and systems continues to grow in very exciting ways, as computer power increases and software offerings become more sophisticated. The demise of dedicated hardware-based products, which some people predicted, has not occurred—and I don't think too many people are holding their breath any more.

"For me—and many others, I'm sure—the effect of these changes, as well as new ones coming into play now, such as DTV, DVD, etc., has been

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Courtney Spencer, 1982

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to keep our industry very dynamic, continuously challenging, and above all, a lot of fun to be involved with.

"Pro audio is a very competitive business, where we—like most of our competitors—have a true passion for what we do. I think the challenge here for me has been to create the feel of a small company, while building on Sony's unique strengths."



Chris Stone

A true studio pioneer, Chris Stone co-founded the Record Plant in 1967 with the late Gary Kellgren, recording many of the world's top artists (Rolling Stones, John Lennon, The Eagles, Bruce Springsteen, etc.) before selling the studio in 1989. In 1979, he co-founded SPARS and served as both president and chairman of the board. Today, Stone is the globe-trotting CEO of the World Studio Group, a privately held affiliation of world-class recording studios, which he launched in 1992.

"The biggest change has been the evolution of recording flexibility, from 4 to 48 tracks, and then to unlimited hard disk space, thanks to the power of computers. This, coupled with the advent of digital technology, which is only now coming to fruition (Record Plant had 3M 32-track digital machines in 1979), is most exciting. In addition, the advent of global recording through communications technology (ISDN, satellites, the Internet) has allowed the fantastic growth and worldwide synergy our industry is now experiencing.

"My most gratifying experience during this period had to be supervising the recording of Woodstock '94. The record, which went Platinum, turned out magnificently; it was everything the first Woodstock wasn't, in terms of quality. A&M gave us whatever we needed, including 14 48-track



Chris Stone in Record Plant days

digital machines. We had four trucks with two machines each, and another six recorders in three studios at Bearsville. The excitement of being part of the live recording of an historic music event is unbeatable."

John Storyk

One of the first studio designers to be interviewed in Mix (October 1979), John Storyk has been plying his craft since 1969, when he worked on Jimi Hendrix's Electric Lady Studios. Since then, he has been responsible for more than 600 recording studios, video facilities and radio stations, as well as



John Storyk at the table

small clubs and theaters. Storyk's projects have ranged in size and complexity from personal studios for Whitney Houston and Shaquille O'Neal and screening rooms for New York's Planet Hollywood to a multistudio complex for L.A.'s Margarita Mix and a 15,000-square-foot, ten-room complex for SynchroSound in Kuala Lumpur.

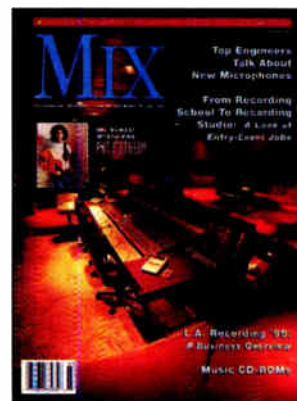
"I would cast my votes for the obvious changes in the past 20 years: digital, desktop audio, multimedia awareness, etc. The number of studios has grown tenfold—possibly more—as the equipment and technology have become accessible to so many. Interesting enough, people still want and need environments; in fact, the environments have become even more important. There is certainly no shortage of opportunities to design.

"Auralization and testing have exploded. DSP technology has given more analysis and prediction tools to more people. Yes, the computer should not be forgotten—it's the Holy Grail of our industry (after a great melody, of course). If there was ever an industry that enjoyed being wired and connected, it's ours. In a given day, I am in California, New York City, Buenos Aires or Bombay. I don't remember this happening 20 years ago!" ■

—FROM PAGE 38, 20 YEARS IN MIX

how cool the arrangement and the recording of this 33-year old nugget is.

—Blair Jackson, "Classic Tracks: 'The Lion Sleeps Tonight,'" Dec. 1994



1995

Bass-ics: For the well-known Chris Squire [of Yes] bass sound, we put the bass through more of a guitar amp setup, which I think was a Sunn amp with either 10-inch or 12-inch speakers. I took it direct, at the same time. On the amp, we went for lots of treble and distortion. I would just roll the bass end off of the amp, so it was all click and presence. I used the direct for the low end. I mixed those two signals together, while making sure they were in-phase. By balancing the two, I could bring out the lows or focus on the treble side. I would usually bring out the upper midrange, about four or five thousand, to bring out that gritty, trebly sound. By itself, the amp sounded like a piece of shit, but when you mix it in with the direct, it sounded great.

—Eddy Offord, "Bass Applications...Basically," by Rick Clark, Jan. 1995

1) XLR: Pin 2 or Pin 3 Hot?: I know it's hip to be a rebel in rock 'n' roll, but the IEC, AES, EBU, SMPTE, ANSI and NASA all say Pin 2! (IEC 268.12, AES DRAFT AES14-299X). And this is not new, this is old news. Okay, so I don't really know about NASA, but I bet they would say Pin 2...We use NTSC for television, 44.1 for CDs, red means stop, and green means go. Why can't we all just get along with Pin 2?

—Stephen Anderson, "Insider Audio: Top Ten Technical Complaints," Feb. 1995

Insider Intro: Talk to many people in the industry, and you'll get the same

—CONTINUED ON PAGE 113

The Best of Bonzai

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I see images of a Pink's Chili Dog served on fine china at Leonard Cohen's L.A. garret. David Lindley and some boiled soybeans with a flask of fine Shochu. A bottle of Beaujolais in Van Dyke Parks' garden. Cheese and cucumber wrapped in seaweed out on the patio at Hissville with Walter Becker. A bowl of chicken soup on a streetcorner with Don Was.

Here's just a sample smorgasbord, a few memorable bites, some spicy moments. Table talk and saucy wisdom from those who have faced the music.

ROBERT MOOG, 1984

What is the basic contribution you have made to electronic music?

I guess the single thing that accounts for the success is that I pointed the development toward the use of keyboards and the making of sounds that turned out to be popular. The Mini-Moog was just a distillation of the early modular synthesizers, with convenience and a sound that became a standard. We started using the word "synthesizer" three years after we began in 1967.

LES PAUL, 1985

Which of your inventions paid off the most?

The Les Paul guitar—but it took years to get it really going. Mr. Berlin, who was the head of Gibson, asked me

shortly before his death, "When you came to me with that broomstick with the pickup in 1941, did you ever believe in your wildest dreams that it was actually hockable?" Of course I did. I was the only one who believed it at the time, but I never got discouraged.

FRANK ZAPPA, 1985

How would you like to be remembered in the distant future?

I would rather not. I think that people who build an aspect of remembrance into their work habits—like, "If I don't do this, then how will I be remembered?"—that's really bad. You should just plan for *The Big Blotch*.

ROGER LAGADEC, 1985

How will the new technology improve human experience?

The way I see it, there will be a weird mixture of things. We must have people who have an impeccable knowledge of technology, absolutely flawless—but there must also be people who do strange things. There will be no progress unless there are people with strange ideas. Digital audio started that way, when the very idea of transmitting sounds with pulses was thought to be ludicrous. But films had been expressed with a series of still pictures. The digital sample and the still picture are the same thing.

STEVIE WONDER, 1986

What fulfills your heart the most?

I love people. I love meeting people and bringing a smile, a positive feeling. I have been fortunate to do many things in this profession, which is something that I cherish very highly.

And yet, as much as I love it, I want others with talent to have the opportunities. It's just not enough for me alone—I want it for other people, as well.

STEPHEN "DR. MICROPHONE" PAUL, 1987

Do you believe in magic?

Oh, yes. It's an essential part of the formula. We live in a vibratory universe. Our complete sensory experience is a vibration-based one. From the ditherings of quanta-packets which compose substance to the touch, to the force of the atmosphere—which, although invisible, is capable of lifting 600 tons of airplane off the ground—the phenomena of acoustics is so complex that no math can truly do it justice.

LEONARD COHEN, 1988

Any business advice for musicians?

Well, I remember when I went down to New York with the intention of establishing myself in the music business. I was not a boy. I was in my early 30s, and my mother said to me, "Leonard, be careful—those people aren't like us." I was very resentful of my mother suggesting that she could tell me anything about things. But you know, she was right. They aren't like us. So, that's a good thing to remember. Whatever you think it's going to be, it's not going to be like that. However crooked you might have heard it is, it's going to be a lot more crooked than that.

ANDY SUMMERS, 1988

What makes a great producer?

What I want from a producer is a safety net, in a way, so I can be free to flap around in the studio and know that someone is there keeping things defined, holding the show together.

GEORGE MARTIN, 1988

What is the role of the producer?

The role of producer has changed. There are more engineer/producers now. I'm the old-fashioned type, a producer who is a musician and likes to work with an engineer who's an engineer. I think that the two roles are very difficult to combine.

I think the role of producer has become a bit too important. Because of that, people say, "I want to produce. I want to do this myself. Look at my album—I produced it myself!" It's a boast, and I don't think it should be. I think they should say, "Let's get a good producer to help us."

BOB CLEARMOUNTAIN, 1989

Is it getting harder and harder to get into the business because of the technical leaps? Any words to the wise?

Yeah, forget it. [Laughs] First of all, you should have a bit of musical background. You should know about time signatures and keys, some basic stuff in music. Music is what you are dealing with, and that is more important than the technology. They really make it easy for you nowadays. It's just a matter of pushing buttons, and you turn the knobs until it sounds right. Don't get hung up on the technology. There is no wrong way to make records. If you use a mic that I wouldn't use for hammering nails and it works, then that's great.

DR. JOHN, 1989

How do you feel about getting older?

I've always believed that age is a state of mind. We age ourselves only in the ways that our spirit is aged. The meat may decay, but the spirit never will. As long as we keep some focus on the spirit, we're doin' alright. The spiritual side makes it all immortal.

What do you have in mind for yourself when they carry that big box down the streets of New Orleans?

I was hoping they would have a large fiery ceremony—maybe they can set me on fire and let whatever is still burning go adrift down the Mississippi River.

HERB ALPERT, 1989

Why did you pick the trumpet?

I liked the sound. And you could probably do a psychological study on trumpet players. I don't know if it's a need to be the center of attention, but I think we need to be heard. [Laughs] The trumpet is not one of those instruments that you can hide behind. You hit a couple of clams on the horn when you're playing in a section or a small group—it's really heard. Before the electric guitar was cranked up, the trumpet player was the guitar player of yesteryear.

DON WAS, 1990

What can computers do better than humans, musically?

I don't think that computers are musical. What they do is remember 10,000 DX-7 settings better than humans.

ALLEN SIDES, 1990

What was it like working with Sinatra?

Frank came in, walked up to Quincy and said, "Let's take it." He goes over to the mic, and I haven't even heard

him yet. No chance to set levels, no chance to set anything. And with Frank, it has to be right.

DAVID LINDLEY, 1990

Any words of caution for those kids whose hearts are in the music?

There is a tradition in the music industry that is perpetuated by certain people who say, "You just play the music, and we'll take care of everything else." And they try to convince musicians that if you go into the business area, and publishing, it will take away from your music. It does *not* take away from your music—it makes it better, because it stretches your mind in an area that is musical, too.

PHIL WOODS, 1991

What do you think of the music business?

I prefer to be a thorn in the side of the whole music establishment. I think they're a bunch of assholes.

ARTIE SHAW, 1992

What advice would you give to young musicians?

Do what you love, and everything will follow from that. And remember, no advice is any good until you follow it. Do the best you can. Follow your deepest impulses, and if they are mistaken, you will make mistakes. If you don't make mistakes, you'll never learn anything. Nobody ever learns from success; you learn from failure. And don't follow me—you'll just make the same mistakes I did.

RICKIE LEE JONES, 1992

Any advice for newcomers to this music business?

Keep your publishing. Don't sell your publishing, because that's how you'll live when things aren't going well. And remember, the record company is not basically your enemy. They are there to work with and to help promote your career. Don't regard them as an enemy, until they are.

BRUCE SWEDIEN, 1992

What's the hardest part of being an engineer?

The hardest part is to be willing to give of yourself to the project—to commit totally to what you are doing. And there *are* things you have to give up—like free time.

GEOFF EMERICK, 1992

Of all the sounds you came up with for The Beatles, is there any one that you

are especially proud of?

I guess it would be on "A Day in the Life." The gradual long fade, done manually, was monumental. To make that end crescendo loud—it wasn't written, the orchestra was told to go from A to E in 37 bars and do the best they could. I was playing the faders as the song progressed and realizing that what I wanted was another 6 dB by the time I got to the end. I pulled the whole thing way up. I'm proud of doing that—how else could you have done it?

TOM PETTY, 1993

What keeps you good?

What'll keep you good is to enjoy what you're doing. You can't fool the audience—if you're not enjoying it, it really won't sound good. What I've learned is the most simple lesson—the real secret is to get in there and have a good time, and that somehow gets on the tape. I just enjoy music, and I only do it when I'm enjoying it. And that seems to have paid off, for a long time.

PHIL RAMONE, 1993

Can you recall the first session where you flew solo as an engineer?

Yes, and afterwards there were stains on my pants. It was a Neil Sedaka record. I was about 17, and I had never balanced a whole rhythm section before. It was like the first time that your dad says, "Okay, son, now you take the wheel." It was incredibly exciting, and I still get that feeling.

TAJ MAHAL, 1994

What would you tell a kid who came up to you and wanted to follow in your footsteps?

If you have any way to clearly get back to an ethnic background that you have, go back and take the best from it, bring it forward and meld it with good music from the time in which you exist.

ED CHERNEY, 1994

Is there a magic moment when you know you've found the mix?

Yes. And once you get that moment, you have to try to stay the course. Don't try to change things too much from that moment, although the tendency is to keep chasing.

RICHARD THOMPSON, 1994

Any inspirational words for those thinking of entering the music business?

Be honest. Tell the truth. Trust your instincts. And never eat at a restaurant called "Mom's." ■

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12 Years of TEC Awards Highlights

Over the past 13 years, the TEC Awards have honored hundreds of the brightest stars in the recording industry. And while many of the names have changed annually, there have been a select few that have consistently been nominated and/or won TEC Awards for their contributions to the audio industry.



The great Les Paul and singer/guitarist John Sebastian played a lively duet at the 1993 TEC Awards in New York.



The one and only Phil Spector accepts the TEC Hall of Fame Award in 1995.



The 1989 lineup of presenters and nominees (Top, L-R): Hillel Resner, Bill Porter, Stephen St. Croix, Bob Moog, Hal Blaine, John Woram, Roger Nichols, Neil Dorfman, Rupert Neve, Bruce Merley; (Bottom, L-R): Les Paul, David Schwartz and Mr. Bonzai.

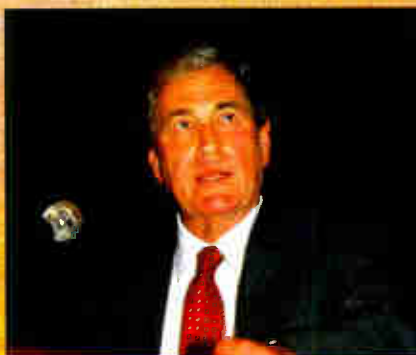


Legendary producer George Martin accepts the TEC Hall of Fame Award in 1989 from Hillel Resner (L) and David Schwartz (R).

Photos by: Claude Rolo, Alex Berliner, Gary Gershoff, Susan Salinger, Eric Somansen, Alan Periman, Eric Charbonneau



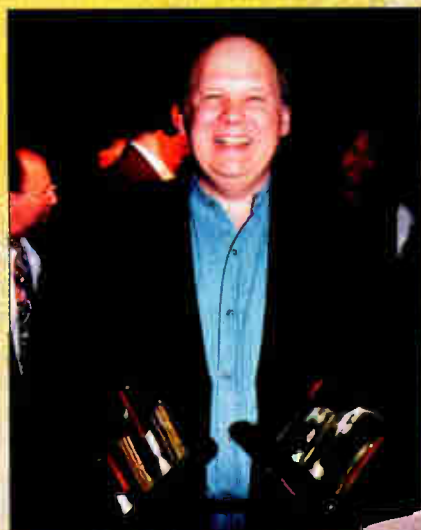
Brian Wilson received the Les Paul Award at the 1996 TEC Awards in Los Angeles.



Ray Dolby, who revolutionized both studio recording and film sound, received the 1991 Hall of Fame Award.



Boz Scaggs and **Ray Benson** jammed with **Don Was** and **Booker T. Jones** at the 1994 TEC Awards in San Francisco.



Bob Ludwig picked up two TEC Awards in 1996—one for Mastering Engineer and another for Mastering Facility.



Captured at the 1991 TEC Awards in New York (L-R): Bassist **Will Lee**, emcee **Weird Al Yankovic**, **Les Paul**, **Art Garfunkel**.



Herbie Hancock shows off his 1994 Hall of Fame Award with **Charlie Lahaie** of the House Ear Institute and musician **Nathan East**.



The heavies: **Phil Ramone**, **Herbie Hancock**, **Alan Parsons**, **George Martin** and **Father Guido Sarducci** at 1994 ceremony.



George Massenburg (center) was the 1990 Hall of Fame inductee, while **Bob Clearmountain** and **Don Was** received TEC awards for engineer and producer, respectively.



Veteran musician and producer **Al Kooper** emceed the 1995 TEC Awards in New York and performed as well.



Roy Clair received one of **Clair Brothers'** numerous TEC Awards from **Don Was** in 1994.

RECORDING STUDIOS

Five-time TEC Award winner (1991, '92, '93, '95 and '96) **Ocean Way** (Los Angeles) has seven studios housing custom API, Focusrite and Neve consoles with GML automation, a 100-input SSL G+ and 9000J with Ultimotion, and a discrete 80-input Neve 8078. Its 21 years of success can be at-



George Massenburg presents the 1991 Hall of Fame Award to renowned engineer Bruce Swedien.

tributed to its remarkable-sounding large live rooms, unique custom equipment, exotic tube microphone collection and conscientious staff.

Record Plant (Los Angeles) has been one of the world's leading studios for the past 29 years. Nominated five times for a TEC Award and winning once (1994), Record Plant comprises a production/post room, two tracking rooms and two overdub rooms. Most recently, the company added an 80-input SSL 9000.

Power Station (New York City) dominated the early years of the TEC Awards in the category of Recording Studio, winning in 1985, '86, '87, '89 and '90, and receiving the Les Paul Award in 1991. Founders Tony Bongiovi, Ed Evans and Bob Walters bucked the '70s trends toward "dead" sounding rooms, making Power Station the first recording studio conceived and designed for multitrack recording.

ACOUSTICS/FACILITY DESIGN

Walters-Storyk Design Group, based in Highland, N.Y., has been nominated for nine TEC Awards and walked away with four (1990, '91, '93, '96). Along with partner Beth Walters, John Storyk has provided original architectural and acoustical design for leading professional audio and video facilities worldwide for more than 25 years.

Nominated for six TEC Awards, **Waterland Design Group** (Holly-

wood, Calif.) offers design and construction supervision for audio, video and motion picture production and post-production facilities. Created by Vincent Van Haaff, Waterland has worked on projects around the world.

Specializing in architectural/acoustical design and consulting, **Russ Berger Design Group** (Dallas, Texas) has accomplished more than 800 recording, broadcast and film projects coast to coast. This seven-time nominee and three-time winner (1991, '92, '95) works on projects ranging from thousand-dollar remodels to new multimillion-dollar facilities.

SOUND REINFORCEMENT COMPANY

Showco (Dallas, Texas) and the Prism sound system have toured the world many times over the past 27 years. This 12-time nominee and four-time winner (1988, '91, '92 and '93) continues to experience growth in its European and Japanese operations and expanded service throughout the Pacific Rim, Latin America, Africa and Asia.

Audio Analysts was incorporated in 1968 by Bertrand and Pierre Pare. With the head office in Colorado Springs, this 11-time TEC nominee provides audio systems to major touring groups throughout the world. Along with touring duties, Audio Analysts hosts an installation division.

With more than 30 years of experience, **Clair Bros. Audio** (Lititz, Pa.) includes touring and installation divisions, as well as worldwide offices in Nashville, Mexico City, Basel, Switzerland, Tokyo, Sydney, Australia and Singapore. This nine-time TEC nominee and eight-time winner (1985, '86, '87, '89, '90, '94, '95, '96) is capable of fielding 14 sound systems on the road simultaneously.

MASTERING FACILITY

Bernie Grundman Mastering (Hollywood, Calif.) and Bernie Grundman have been nominated a total of 23 times and walked away with ten TEC Awards. Grundman and/or the facility received awards in 1985, '86, '88, '91, '92 and '93. Founded in 1983, the facility has consistently maintained its position as the largest mastering operation on the West Coast, with numerous Gold and Platinum recordings being mastered by its key engineers: Bernie Grundman, Brian Gardner and Chris Bellman.

Currently celebrating its 25th anniversary, **Masterdisk Corporation**

(New York City) has been a trendsetter in the delivery of mastering services to the recording industry. It has also earned its fair share of TEC Awards nominations (11) and wins (1987, '89, '90, '91).

With almost three decades in the mastering business, **Sterling Sound** (New York City), has been recognized by the TEC Awards nominating panel 11 times. From the founding of the company, vision and commitment to excellence have created an environment that nurtures musical creativity and fosters technical innovation.

REMOTE RECORDING

Le Mobile (Vista, Calif.) has been nominated for 13 TEC Awards in the category of Remote Recording Facility, winning in 1987, '89 and '94. Owned by Guy Charbonneau, a six-time nominee and winner in 1989, Le Mobile has been a regular on the rock 'n' roll highway for more than two decades. Conceived as a rolling studio, Le Mobile rivals some of the best recording studios in the country.

AUDIO POST-PRODUCTION FACILITY

Five-time TEC Award nominee, **Howard Schwartz Recording Inc.** is a nine-room audio post-production facility. Located above Grand Central Station in the heart of Manhattan, it caters to TV, motion picture and advertising clients. Still owned and operated by its CEO and founder, Howard M. Schwartz, it is currently in its 22nd year of service to the professional audio community.

Four-time TEC Award winner (1992, '93, '94 and '96) **Skywalker Sound** (San Rafael, Calif.), the audio post-production division of Lucas Digital Ltd., has six world-class mixing studios, a scoring stage, ADR and Foley suites, 34 editing suites and a 300-seat screen-



Two veteran TEC Awards hosts and world class characters, Phil Proctor (L) and Mr. Bonzai.



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ing room. It is one of the largest, most versatile, full-service audio post-production facilities in the industry. The Skywalker team has garnered ten Academy Awards for sound, two Grammys, two Gold records and two Platinum records.

Sync Sound's staff records and edits a wide variety of programming. This seven-time TEC Awards nominee (New York City) offers complete audio post-production services for features, television series and specials, documentaries, OmniMax, HDTV and home-video. Sync Sound co-owner Ken Hahn has 19 years of experience in audio post. He has received four Emmys, 13 Monitor Awards, the Cinema Audio Society Award for *Three Tenors* in 1996, 11 TEC Awards nominations and the 1991 TEC Award.

RECORDING ENGINEER

Seven-time TEC Award winner (1985, '86, '87, '91, '94 and '96) and Les Paul Award recipient **Bob Clearmountain** has been recording, producing and mixing since 1972. Some of his most noted productions include albums by The Pretenders, Simple Minds, Bryan Adams and Paul McCartney.

In 1957, four-time TEC Awards nominee and TEC Hall of Famer **Bruce Swedien** went to work for RCA Victor in Chicago. While there, he did several recordings with the Chicago Symphony Orchestra and recorded Jimmy Dorsey's last album. He went on to work for Universal Recording Studios, recording nearly every major artist that passed through Chicago. Since going independent in 1969, Swedien has done his major share of projects in New York and Los Angeles on albums and motion picture scores.

Grammy winner and seven-time TEC Award nominee (winning in 1995) **Ed Cherney** began his career as a freelance engineer in the mid-'80s, producing Dave Mason's *Some Assembly Required* and *Idle Tears* with Chuck Plotkin. His work with Ry Cooder and David Lindley led to a partnership with Don Was.

PRODUCER

Five-time TEC Award winner (1990, '92, '93, '94 and '96) **Don Was** is one of the most successful record producers in the music industry. He has worked with a diverse array of best-selling artists, ranging from the Rolling Stones, Bonnie Raitt and Bob Dylan to

Elton John, Neil Diamond and Willie Nelson. He received the Grammy for Producer of the Year in 1995, a year in which the records he produced garnered 15 nominations and awards, including Best Rock Album for the Rolling Stones' *Voodoo Lounge* and Best Pop Album for Bonnie Raitt's *Longing in Their Hearts*.

MASTERING ENGINEER

Greg Calbi joined Masterdisk in 1994 after 18 years as a mastering engineer at Sterling Sound, preceded by four years at Record Plant in New York City. Now in his 25th year of mastering, Calbi is a six-time nominee.

Seven-time TEC Award winner (1986, '87, '89, '90, '94, '95 and '96), recipient of the first Les Paul Award, Eastman School of Music graduate and former vice president of both Masterdisk and Sterling Sound, **Bob Ludwig**



(L-R): Record Plant's Rose Mann with her husband, engineer Ed Cherney, and TEC Awards executive director Karen Dunn.

is now owner and president of Gateway Mastering Studios (winner in 1994, '95 and '96) in Portland, Maine.

Ten-time nominee **Ted Jensen** has been with Sterling Sound since 1976. He was appointed chief engineer in 1984 and vice president in 1991. Along with his mastering duties, Jensen has also worked with several equipment manufacturers in designing and testing new recording products.

SOUND REINFORCEMENT ENGINEER

Showco senior engineer and sales executive **M.L. Prociase** has been nominated for six TEC Awards. During his career he has mixed shows for ZZ Top (more than 120 shows during one eligibility year), Genesis, Average White Band, ELO, Joan Armatrading, the Bee Gees, Thin Lizzy, the Beach Boys, the Jacksons featuring Michael Jackson, Boston, Mike & the Mechanics and Guns N' Roses.

Bruce Jackson, three-time TEC Awards winner (1986, '88, '95), and

founder and president of digital audio pioneer Apogee Electronics Corp., took off his electronics hat in 1995 to engineer Barbra Streisand's return to the stage after 27 years, contributing to her rave reviews.

Dave Kob started his career in the early '70s, running a small P.A. company, Mariani Sound. This seven-time TEC Award nominee toured with the Johnny Cash Show, Carl Perkins, the Statler Brothers, Joan Baez & Mimi Fariña, Issac Hayes & the Movement, and numerous Sunn Music Equipment Company promo tours.

Seven-time nominee **Robert "Cubby" Colby** has lived most of his life in Minnesota. In 1979, he went to work for dB Sound, then worked as Prince's monitoring engineer before becoming a full-time employee of Paisley Park for five years. Colby went independent in 1989.

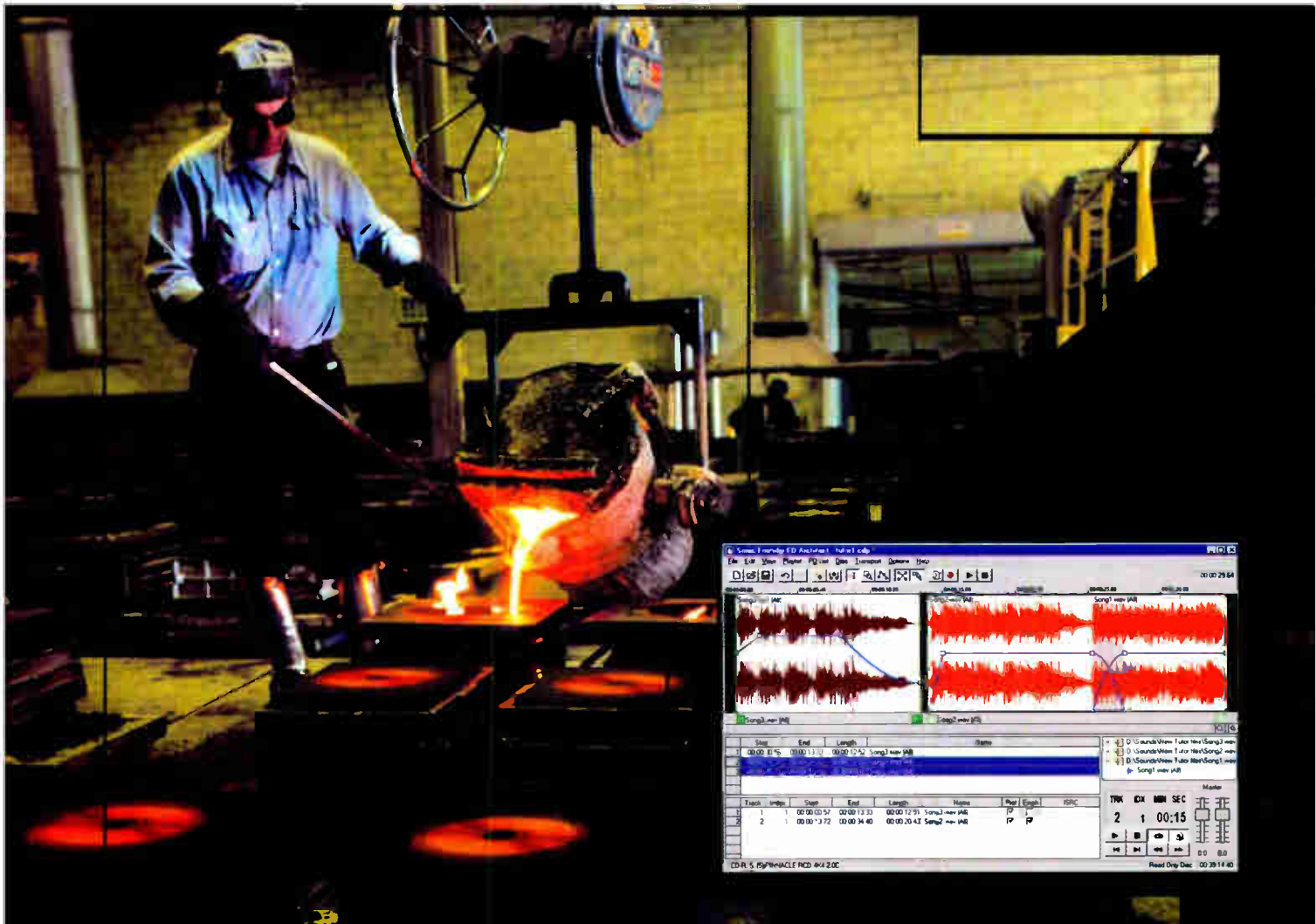
Beginning his career as a musician in the 1970s, **Robert Scovill** has garnered four TEC Awards (1992, '93, '94, '96). While working with Electrotec Productions, Scovill mixed such diverse acts as the Go-Gos, Rick Springfield, John Mellencamp, Air Supply, Laurie Anderson and Alice Cooper. In 1991, Scovill opened his own production company.

REMOTE/BROADCAST RECORDING ENGINEER

Seven-time TEC Award nominee **Biff Dawes** began his career at Wally Heider Studios in the 1970s, engineering numerous studio and live recordings, including Bob Dylan, Fleetwood Mac and Richard Pryor. Dawes joined Westwood One Mobile Recording (Culver City, Calif.) in 1982 as chief engineer/mixer for the radio concert recordings and broadcasts.

Ed Greene is an independent engineer/mixer/consultant at Unitel and Complete Post in Los Angeles. This nine-time nominee and 1995 winner primarily works on specials, awards shows and music productions. His work has been acknowledged with at least two dozen Grammy nominations and ten trophies.

Eleven-time nominee and five-time winner (1987, '92, '93, '94, '96) **David Hewitt** is president and chief engineer of Remote Recording Services (Lahaska, Pa.), a 12-time nominee. Hewitt's Silver Studio is a custom-built tractor-trailer featuring Neve and Studer recording equipment. Hewitt has specialized in live recording and broadcasts for nearly 27 years. ■



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THE CRYSTAL BALL

by Blair Jackson

Everyone loves to make and hear predictions. Remember in the late '50s when we were all told that everyone would be driving flying cars by the year 1985? Didn't quite work out that way, did it? Or that a steak dinner at a restaurant would cost more than \$25 by

try's brightest thinkers (and longtime friends of *Mix*) to tell us whether where the industry is today is what they predicted ten years ago, and what they see in that crystal ball that every self-respecting futurist keeps in the closet next to their collection of Quadraphonic

as owner of Universal Recording, now audio director for the multimedia company Electronic Arts; **Craig Anderson**, former *Mix* columnist and editor of *Electronic Musician*, whose many books and articles have made him one of the most respected voices in audio;

Seven Views of Where We Are And Where We're Going

the year 2000? No way, we said. Hmm.

The audio industry has always been filled with creative souls who have one eye firmly fixed on the future and who are completely dedicated to taking technology to the next step—whatever that may be. This is why the “state of the art” changes every five minutes, and why that prototype you’ve been beta testing is going to become yesterday’s news when this *other* cool thing comes out tomorrow.

We asked seven of the audio indus-

try's brightest thinkers (and longtime friends of *Mix*) to tell us whether where the industry is today is what they predicted ten years ago, and what they see in that crystal ball that every self-respecting futurist keeps in the closet next to their collection of Quadraphonic LPs. Our distinguished panel: **Ken Pohlmann**, head of the University of Miami's prestigious recording program, digital recording guru and for many years a *Mix* columnist; **Paul Lehman**, professor at the University of Massachusetts Lowell and now author of *Mix*'s monthly “Insider Audio” column; **Russ Berger**, president of the Dallas-based, TEC Award-winning studio design company Russ Berger Design Group; **Murray Allen**, former dean of the Chicago recording scene

Toby Mountain, a thought-provoking writer and a talented mastering engineer at his own company, Northeastern Digital; and **Stephen St. Croix**, the brains behind Marshall Electronic and an irrepressible industry gadfly in his monthly *Mix* column, “The Fast Lane.” These seven fine individuals have our personal assurance that we will not mock their predictions ten years from now—unless, of course, we can get a cheap laugh out of it.

TAL BALL



ILLUSTRATION BY
Jim Pearson

Ken Pohlmann: In 1987, I figured that digital audio would be a great force of technology democratization, and that really has happened. The low-cost, widely available, high-quality digital audio stuff has transformed the business. It's actually gotten to be low cost faster than I thought it would, but that was always my hope. Back in the old days, you needed something the size of a Winnebago with about two or three good engineers tweaking around it all the time to make it work. And with digital, of course, you don't need any of that. Therefore, since it becomes real user-friendly and very low-maintenance, and it all becomes reduced down to silicon, all these trends come into place. The real big news, of course, is that in the old days you had big mechanical transports and other sorts of high-cost, hand-built, low-volume items. But once the world gets digital, it goes onto silicon chips, and once you go silicon chips, it's just a question of volume, and as the volume increases, everything gets cheap.

The next step is for the democratization trend to go even faster. There's

no reason why you couldn't expect to see the same quality or even better-quality equipment for even lower prices and widely available to everybody and anybody who wants to use it. There are actually two trend lines. On one, the prices sort of stay about the same. A PC costs about the same as it always has. But the processing power probably doubles every year or so. So that's what we'll see in digital audio. The actual prices might stay relatively similar, but they're going to get more and more comprehensive, and there's no reason, for example, why we can't expect to see desktop systems that handle audio and video simultaneously, so you could do all your own online recording of both audio and video editing and post-production in your spare bedroom. So the same thing that's happened to audio studios will probably happen to video studios.

What's lagging out there is creativity. Frankly, I think that electrical engineers and other audio gurus have made great advances in terms of what the machines can do, and what really hasn't changed a lot in the past couple

of decades is the creative output. The music itself is evolving, but the way it's recorded and the way it's presented to the consumer really hasn't budged since the 1950s. Stereo's been around since then as a consumer format. One minor step forward will be the advent of 5.1 playback for the consumer—that's already happening in a big way. And I think probably the next big leap for the industry is to figure out how to use 5.1 mixing in a very creative way. We have to avoid all the pitfalls and problems and poor taste that we saw when Quad was introduced in the '70s, and figure out a better way to spread music around throughout a space in an intelligent fashion. I think that perhaps what we really need is another Steven Spielberg or Bill Gates or Les Paul or some individual to step forward and do it and demonstrate what can be done creatively—how to use all this great technology in a more creative, artistic way. And once he or she does that, then we're off on a whole new era.


Paul Lehrman: What's happened is pretty similar to what I predicted ten years ago. The idea that everything would be digital and everything could be brought inside of one platform was pretty clear—the digital audio workstation being the be-all and end-all. So in that regard, I think we all nailed it. I think what we *didn't* nail was the modular digital multitrack, the low-cost digital. I think everyone thought that low-end studios would still be working with 1/4-inch, 8-tracks at this point. So that one we probably missed. The other thing that I predicted a long time ago was that the differentiation between the MIDI studio and the professional audio studio was going to disappear, and that has certainly come true.

You could say that in some ways the democratization has backfired and it's going to lead, in the next few years, to a stratification of the audio world all over again. It's going to have to do as much with delivery systems as it is with the actual production. There are going to be two types of audiences. There are going to be audiences who expect a lot, and there are going to be audiences who expect very little in terms of audio. There are going to be audiences that have home theaters, 5.1 setups, who go to the movies all the time, who expect real high-quality stuff. And then there's

—CONTINUED ON PAGE 125

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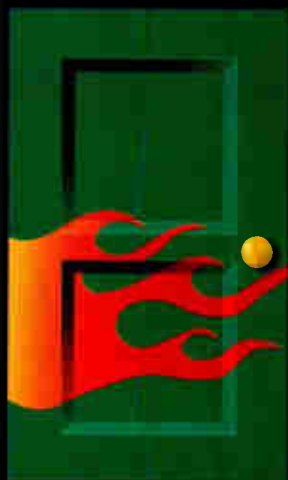
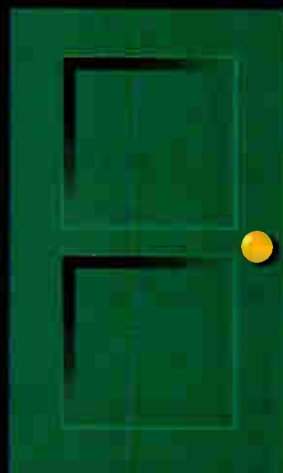


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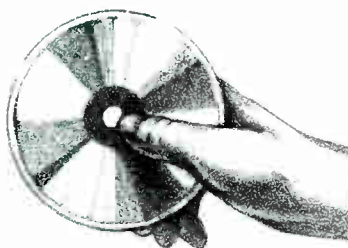
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Ad Index and

PAGE	PRODUCT INFO #	ADVERTISER	PAGE	PRODUCT INFO #	ADVERTISER
19	001	AKG	92	036	Hot House Professional Audio
2	002	Alesis	BC	•	JBL Professional
17	003	AMS Neve	79	037	Joemeek/PMI
81	004	Apogee Electronics	65	038	Lexicon
57	005	Applied Research & Technology (ART)	IBC	039	Mackie
71	006	Ashly	96	040	Manley Laboratories
114	007	Audio Intervisual Design	3	041	Meyer Sound
6-7	008	Audio-Technica	119	042	Micro Technology Unlimited (MTU)
101	009	Banta Publications Group	53	043	Neumann/USA
67	010	BASF	123	044	Northeastern Digital
80	011	Belden	29	045	Otari
75	012	Bryston	63	046	Peavey
128	013	David Carroll Electronics	89	047	Presonus Audio Electronics
91	014	Creamware/Mediamagix	116	048	Quad Recording Studios
127	015	The DAT Store	15	049	Quantegy/Ampex
93	016	dbx	115	050	Record Plant
37	•	Digidesign	95	051	Sam Ash Professional
120	017	Disc Makers	33	052	Sennheiser
54	018	Dolby	85	053	Shure
121	019	Dorrough	125	054	Skip Saylor Recording
117	020	EAR Professional Audio/Video	105	055	Skywalker Sound
31	021	Electro-Voice (EV)	IFC-1	•	Solid State Logic (SSL)
12-13	022	Emagic	107	056	Sonic Foundry
69	023	E-mu Systems	27	•	Sony
22-23	024	Event Electronics	73	057	Soundcraft
47	025	Eventide	77	058	Spirit
87	026	Fairlight	45	059	Studer Professional Audio Equipment
49	027	Fostex	39	060	Tascam
55	028	Full Compass	35	061	TC Electronics
40-41	029	Full Sail	124	062	Thoroughbred Music
76	030	Furman Sound	111	063	Village Recorders
56	031	Genelec	51	064	Walters-Storyk Design Group
72	032	Group One	61	065	Whirlwind
127	033	Bernie Grundman Mastering	21	066	Yamaha
110	034	Hearing is Priceless (HiP)	122	067	Z Systems
112	035	The Hollywood Edge			

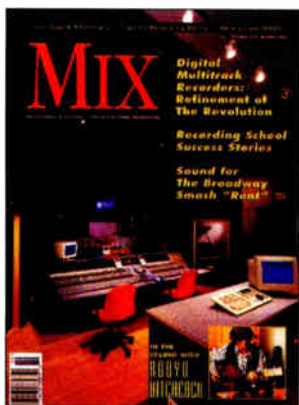
—FROM PAGE 97, 20 YEARS IN MIX

story: Down time in their studios has increased, while those intervals in which they can actually do work are getting briefer and further apart. It's ironic. Years ago, many of us who struggled with primitive software and hardware were telling anyone who would listen that computers would someday save all of us time and money, allowing us to realize all of our audio dreams. Now that the entire music industry is totally dependent on computers to accomplish even the slightest task, those very computers are in danger of making it impossible to produce anything at all.

—Paul D. Lehrman, "Insider Audio: Fear of Frying (My Studio)—Let's Stop Progress Before It Stops Us," Sept. 1995

Gone but Not Forgotten: We live in a disposable age, and nothing is more disposable in our industry than recording media. I don't know about you, but I have DATs strewn everywhere—in the studio, in my briefcase, even a few at home in the kitchen. We take it for granted nowadays that our recordings are replaceable. If the ref from last week's session goes awry, it's a simple matter to roll off another copy from the digital workstation...In the recording studios of 70 years ago, there were no tape masters, nor were there the ubiquitous safeties and work copies. Back when recording was new, there was only one way to preserve a recorded performance: a transcription disc.

—Gabe Wiener, "In the Acetate Groove: The World of Transcription Disc Restoration," Dec. 1995



1996

Safe Sounds: In 1987, an article in the *Los Angeles Times* told the world of Pete Townshend's battle with tinnitus and his hearing loss. Townshend said that

the saddest circumstance of his hearing loss was not being able to hear his children speak to him. The high frequencies, where children's voices are pitched, are usually the first to be affected by noise-induced hearing loss...The article helped bring into the open a problem that had been widespread but largely ignored in the industry since the advent of amplified music: noise-induced hearing loss.

—Charlie Ennis Labaie, "Protecting Your Hearing," Jan. 1996

Dow Jones Audio: When Sonic Solutions went to market, its CEO saw 27 financial institutions in a week-and-a-half. It's a lot like touring, except the stakes are much higher...It's at this point that a professional audio company becomes just another specimen to be analyzed from the clinical, green-eyeshade point of view. It doesn't matter to professional investors whether you make workstations or widgets, they're looking for profitability and growth.

—Dan Daley, "The Pro Audio Industry Takes Stock, Literally," Feb. 1996

The Future Upon Us: The Internet may well be a unique and wonderful vehicle for information exchange, but getting at this information, and saving it to one's own machine for later reference, often feels more like swimming in molasses than "surfing." This is particularly true if the saved information is not merely text but graphics, audio or video...Delivering those files over the existing infrastructure—regular phone lines and modem—is akin to trying to suck icebergs through a straw...During the last year or so, however, a number of enterprising companies have figured out ways to "stream" audio over the World Wide Web, meaning that users can listen to audio directly as it comes over the network to their computers without the wait.

—Philip De Lancie, "Web Audio Goes Real Time," April 1996

The Right Place, The Right Time: I just did a song on the new Melissa Etheridge album called "I Could've Been You" that had a real laid-back, bluesy feel. I used two snare drums. I played on a very small 4-inch wood drum very lightly in the verses. Hugh Padgham made that drum sound so deep and big. Then when the chorus came in, it was more aggressive-sounding, like Soundgarden. That was

a 6½ metal drum, and that drum sounded higher than the other one...I said, "Hugh, what in the world are you doing to get that sound?" He said, "Nothing, just mic placement."

—Kenny Aronoff, "Getting That Great Drum Sound," by Rick Clark, June 1996

I Love the Sound of Breaking... The whole recording process interferes a great deal with the sound of a live orchestra anyway, and if you attempt to maintain total control of the music with a large quantity of close directional mics, it will sound the least natural from an audiophile point of view. For instance, take 30 bass-shy cardioid microphones, put them through a nice, bright modern op-amp mixer, take that through a typically hard analog-to-digital converter and send the master to some uncaring factory. Next, play the CD in your typically bright home CD player, through a thin solid-state power amp and a pair of nice, bright speakers. What you get at the end sounds like breaking glass!

—Tony Faulkner, "Recording the Symphony Orchestra," by John La Grou, Sept. 1996

1997

Web Site Under Construction (But Here's a Couple): Sound companies now face escalating demands within a pricing structure that may appear to have remained constant, but in real, inflation-adjusted dollars has actually declined. Artists' engineers clamor for more equipment, while accelerated obsolescence shortens the useful life of the most expensive components. Year after year, promoters budget the same round, slim numbers for sound, regardless of the show's technical requirements, confident that they can play several vendors against each other should push come to shove. Sound companies are required to provide More for Less because that's what the market will bear.

—Mark Frink, "Touring Loudspeakers: More for Less," March 1997

And a Beauty From Chet: One day I went to work and looked down and realized my shoes didn't match. So I said, "To heck with this. I've got to get out of this business." I don't produce anymore.

—Chet Atkins, "The Mix Interview," by Rick Clark, July 1997 ■

12

who beat the odds

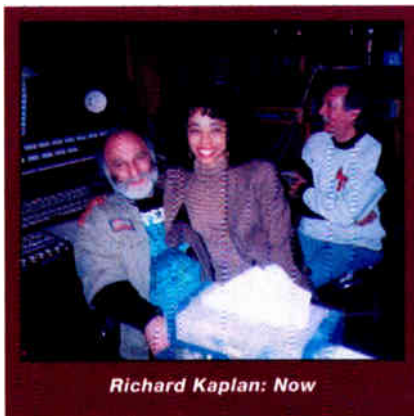
—FROM PAGE 56, STUDIO SURVIVORS

ence or have experienced the same problems that you run into, and you can share solutions."

Preservation on the Reservation: Richard Kaplan's Indigo Ranch

Sometimes survival is an outgrowth of preservation. Nowhere is this more dramatic than at Indigo Ranch in the Malibu Mountains along the Southern California coast. The studio was constructed in 1974 on sacred Chumash Indian meeting grounds, which had been used historically for summer and winter solstice ceremonies, and particularly for music celebrations. In the early part of this century, the land also served as a health retreat for John Barrymore and his family.

Michael Pinder, keyboardist of the Moody Blues, and Richard Kaplan, the group's lighting and sound specialist, found the site the day it came on the market, and they knew from the start it was going to be something special. Under their guidance, the spirit of the location was reflected in the design of the studio and, most impressively, on



Richard Kaplan: Now

the vintage electronics that are the heart and soul of this analog-to-the-max studio.

"We're not the run-of-the-mill studio," says Kaplan. "I think if we were, we'd be dying. We have 100 tube

mics, 30 tube limiters, dozens of Pul-
tects and tube equalizers, and 42 mic
preamps, in addition to the regular
stuff. And we have several walls of
boxed equipment ready to run of
every vintage.

"We're hooked year round with
major album projects—we've been
busy since we opened the door in '74.
We're analog at its finest, and we at-
tract artists from all over the world to
do major album projects here. Our
vintage equipment is so well-built and
maintained that the quality dazzles
people."

A good deal of the credit for Indi-
go's sonic/electronic integrity must go
to the late Deane Jensen, an audio sci-
entist whose legend and respect are
boundless in the minds of many true
audiophiles. "This is definitely a Deane
Jensen studio—he lived here for a
while, he helped us build it," Kaplan
says. "He was a friend and confidante
up till the end. Putting together a
bunch of old tube equipment, espe-
cially with new equipment, is asking
for disaster because everything has to
be systematized. Things match up in
this studio, and they work. We owe
how well it all works to Deane."

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Even in 1997, Kaplan and Indigo Ranch feel no need to rush off into the world of digital equipment, although many of their clients bring in digital gear, and just as often discard it when they compare it to Indigo's analog ar-



Richard Kaplan: Then

senal. "If technology ever catches up with the old stuff—someday it might—we'll be there. But to this day I still like George Massenburg's analogy that digital audio is like listening to music through a screen door."

Ship of Tools:

Skip Saylor Recording

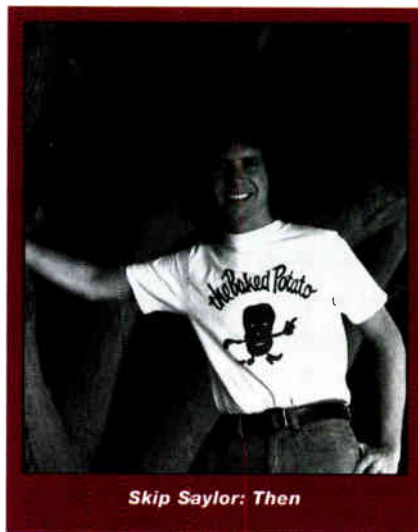
Another studio survivor sticking to tradition is Skip Saylor, captain of his eponymous Hollywood mixing facility. "I look at my job as a historian. Anything I can do to capture that history better is what I'm looking to do. I want to preserve what we've had up to this point, as opposed to how I can change it."

Saylor's outlook leads to a reverence for analog and traditional recording techniques, not unlike Indigo Ranch's Kaplan. "I'm an old warhorse, a throwback from a different era. Record-quality recording is my primary goal. Not every recording studio would necessarily do what I do, like add a 16-channel vintage Neve sidecar to an SSL with Ultimotion. My thing is putting two different kinds of consoles together, to give my clients different sound options."

Despite his adherence to analog and record projects, the challenges of operating a mid-level studio have forced Saylor to adjust to market realities, particularly the home studios. "The midline, mid-priced studio is be-

coming a dying breed. I used to have a room like that, and I've converted it into a 48-track, all discrete mix room because of home recording and because there are just too many studios out there, especially the \$50 to \$65-an-hour bargain studios. They all took a dent out of the overdub business that a lot of studios were involved in at one point."

Saylor sees the evolution of the home studio phenomenon as the end



Skip Saylor: Then

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12

who beat the odds

of a cycle. "We went through a craze where everybody thought they could make a record at home, and I think now they're figuring out the sound quality is not as good at home. There's a lot of aggravation to having a home



Skip Saylor: Now

recording studio, and I don't think everyone with a home studio really wants to be a studio owner and deal with the issues that come with it. I believe home recording will settle into a

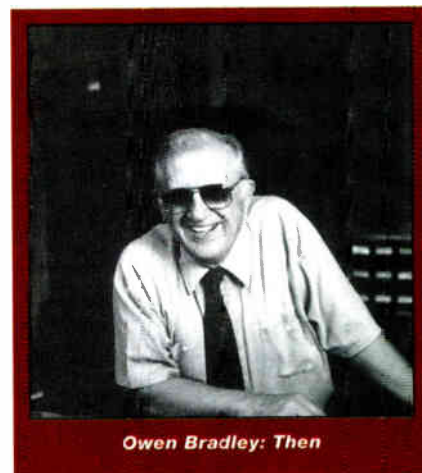
place where it is an extension of doing your homework before you come into the main studio, and then continue working on some parts at home on the ADAT or DA-88, doing overdubs, etc., while finishing the job in the professional room.

"Surviving in this business, for me, means doing my best possible work and believing that if I can maintain one of L.A.'s best studios, and offer my clients unique options for creating their sounds, then I will continue to prosper."

Owen Bradley: Making Hay in the Barn

Few of Nashville's studio survivors have been at it as long as Owen Bradley, owner of Bradley's Barn. Built in 1964 in Mt. Juliet, Tenn., about 20 miles east of Nashville, the original studio burned down in 1980 and was rebuilt in 1982. Its main tracking room is 50x65 feet and attaches to a 30x20-foot room with a relatively small control room recently equipped with an Otari

Concept One console. "I was mixing 60-some tracks last week," says Bradley. "It's a far cry from the way we used to work with one track, or three



Owen Bradley: Then

tracks. Some of the best records we ever did were recorded on one track."

A veteran of dozens of smash hits (on at least one occasion during the '60s, he had produced both the *Billboard* Number One hit on the pop chart and Number One on the country chart), Bradley has been in the music business since he was 15 years old,

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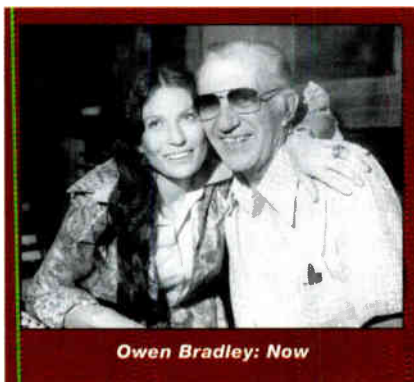
beginning as a multi-instrumentalist in a roadhouse band. He joined the staff of Nashville's WSM Radio in 1935 and moved up the ranks to become musical director by the time he was 32. Simultaneous session work for Decca Records artists led to the label offering him the job of producing records, which he did for about 30 years.

As a prolific producer, Bradley chose to have his own studio early on. He and his brother Harold owned Quonset Hut, built in 1955 on Music Square East in downtown Nashville. Most of the major artists in Nashville at that time were either recording there or at the RCA studios. "The Quonset Hut was where we did all of Marty Robbins' records, we did Johnny Cash, all of Brenda Lee's records, Patsy Cline, Loretta Lynn, Kitty Wells, Ernest Tubbs..."

In 1962, the Bradley brothers sold their studio to Columbia Records, and Owen continued to produce his artists there for a while. But he found that he missed having his own studio. "I started thinking about another studio because my son was just getting out of the service and he had a desire to get into the music business. Plus, I sort of

missed all those big speakers and the fact that I could play back a record loud, which my wife didn't like at home.

"I had a lake house in Mt. Juliet, and every time I went there I passed this big barn. I saw a sign on it one



day that it was going to be auctioned off, so I stopped and bought it. In the back of my mind, I thought I could put some equipment in it and my son could make a little demo studio out of it. So that's what we did. We had very sparse equipment at first. It just had a tin roof, so we couldn't work there when it rained.

"But then Columbia closed the Quonset Hut to outside business, and next thing I knew people were coming up wanting to record at the barn. So I bought some state-of-the-art equipment, fixed the roof and we started really going at it pretty full-time. I was still working for Decca, and they gave me their blessing to work up here with their artists."

For the 81-year-old Bradley, surviving in the studio business continues to be less of a challenge than a way of life. "I enjoy having a studio. I still do a little record production, but I'm really not out looking for projects. We just play it as it comes down the road one day at a time. We are not in the mainstream because we're out in the country. I have a little farm around this place. The main thing is that we still have a lot of fun doing what we like to do. It's sort of a hobby, and a business too."

As far as Bradley's survival tips for others? "Get into the publishing business. Copyrights don't talk back, and once you get them, they're yours for 50 or 60 years. But I never really liked to do that, so I tried the studio business." ■

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—FROM PAGE 81, EVOLUTION OR REVOLUTION?
priced from \$5,995. Today it's the leading workstation platform, with over 15,000 systems in use worldwide.

Yamaha's DMC1000 was the first in a line of serious, small digital consoles. It offered 22 inputs, 10 buses, 4-band parametric EQ, total snapshot automation, moving faders—all at a reasonable \$34,000. Eventually, the DMC1000 found a niche as an outboard mixer for workstations, but its role in the development of Yamaha's 02R digital console in 1996 was more significant.



1992: Tascam debuts the DA-88

1992

Prices Down, Quality Up

The first "affordable" CD recorder arrived at Winter NAMM. The Marantz CDR-600 was a stand-alone, rack-mount unit with digital and analog I/O. Price was "only" \$7,500. Three years previously, Gotham's CDR-90 unit had been priced at \$70,000; in another five years, stand-alone CD recorders would cost less than \$3,000 and CD-R drives for computer use would drop below \$500.

Also at NAMM, low-priced consoles were everywhere. Among the 15 new consoles shown, Mackie's 8-bus line included a 24-channel, 8-bus mixer priced at less than \$4,000.

Activity in the trenches of digital film sound began heating up. Optical Radian Corp./Kodak abandoned its proposed CDS (Cinema Digital Sound) format. Sony announced its SDDS (Sony Dynamic Digital Sound). And *Batman Returns*—the first film using the rival Dolby SR•D format—was released in June. But they were both dwarfed initially by Digital Theater Systems (DTS), which shipped more than 2,000 CD-ROM players (the 6-channel audio was locked to timecode on the film) to theaters with the prints of *Jurassic Park*. Meanwhile, in anticipation of the new era of digital cinema sound, Nagra unveiled its Nagra-D, a 4-channel, 24-bit-capable portable sync recorder. With the eventual demise of sprocketed film dubbers in

the not-too-distant future, Magna-Tech and WaveFrame teamed up to show a prototype of the first disk-based film dubber. It never made it to market, but eventually digital film dubbers would be announced by Akai, Sony, Dolby, TimeLine, SoundStar and Fairlight, with the latter producing the first 24-track units.

SSL broke ground with Scenaria, which had 24 tracks of disk-based audio, 38-channel automated digital console and extensive transport/sync control. SSL's pairing of this system with integrated random-access video signified a revolution in the making.

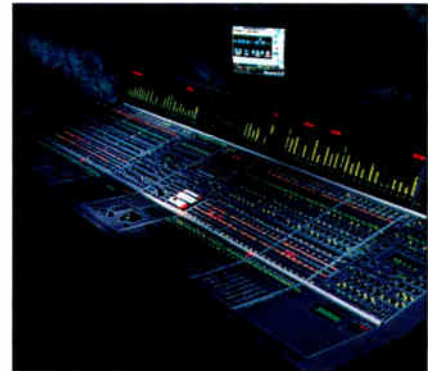
Bring on the BIG digital boards! Neve's Capricorn made its first public appearance at APRS—just in time, as the first MADI-equipped digital multi-tracks were unveiled three months earlier at AES Vienna.

On October 1, 1992, Tascam's DA-88—an expandable 8- to 128-track system offering affordable digital recording on Hi-8mm tape—debuted at AES San Francisco.

Low-cost disk recording came of age. Digital Audio Labs (DAL) showed its CardD, which transformed an IBM 286/386 into a digital audio workstation. Innovative Quality Software's SAW was a fast, efficient program that offered an alternative to DAL's software but used the DAL hardware. In the years to come, DAL—especially with its V8 package—became a major supplier of multichannel I/O hardware for PCs and was supported by numerous software companies.

Unfortunately, great ideas aren't always successful. Joined by Gotham Audio and George Massenburg Labs, AT&T entered pro audio with the unveiling of DISQ, a system based on a

central "mixer core" controlled by a conventional analog console (Neve VR or Solid State Logic 4000/6000/8000). While the user operated a familiar work surface, all digital mixing, routing, signal processing (including EQ and dynamics) was carried out in the background—entirely in the digital domain. The concept was fantastic, but expensive, and DISQ never got beyond a few installs.



1993: Neve Capricorn

1993

The Year of the Console

Audio products generally run in cycles, and 1993 was the year of the console.

Amek's Recall by Langley live sound console brought recall automation that memorizes the positions of all critical controls, along with snapshot automation and virtual dynamics.

A new company, Tactile Technologies, showed the M4000, a digitally controlled analog console with 48-channel controller and remotely located outboard electronics racks. It could be expanded (up to 240 channels) by adding more rack modules. The M4000 began shipping two years later but never gained a foothold in the market.

Once found only on big-ticket mixers, moving fader automation was incorporated into Allen & Heath's affordable analog Saber V; it was followed by debuts of the Soundtracs Solitaire and Soundcraft DC-2000, two under-\$30,000 entries.

Speaking of the BIG Board, Japan's Over Quality console made its State-side debut with an 80-channel version at \$780,000. Harrison updated its breakthrough Series 10 with the Series 12, offering remote-control mic preamps, extensive switching and a Macintosh system controlling console functions. Neve began deliveries of its

1992

► Milestones

RIAA abandons CD longbox
Sony announces multimedia CD-ROM
Tascam intros DA-88

► Beginnings

Emagic
Garwood
Macromedia
Power Technology
Spirit by Soundcraft
World Studio Group

► Anniversaries

25th—Audio + Design
25th—Penny & Giles (audio)

long-awaited Capricorn all-digital console. SSL showed OmniMix, a larger version of its Scenaria system but with a configurable bus structure to accommodate the new surround sound release formats.

JBL previewed the future of studio monitoring in what would become its DMS-1 system, based on an outboard DSP engine that provided crossover, phase correction and transducer alignment. And they just *happen* to fit into UREI 813 soffits...

1993

► Milestones

Sony Super Bit Mapping debuts
Peavey MediaMatrix intros

► Beginnings

LinearX Systems Inc.
Night Technologies Intl. (Nightpro)
Soundscape Digital Technology
TVL (Manley Laboratories)

► Anniversaries

25th—QSC Audio Products
25th—BGW
25th—Community Light & Sound
20th—Soundcraft
20th—Speck Electronics

With the advent of Sony's Super Bit Mapping and Apogee's UV-22 methods of encoding 20-bit signals for release on standard 16-bit CDs, there was a growing interest in mixing to higher-bit resolution, but few options in storage media. Sony's PCM-9000 2-track recorder could store up to 80 minutes of 20-bit (or 60 minutes of 24-bit) on erasable 1.3GB optical disks. Offering random access and ease of editing, it moved up in line as the eventual replacement for the tape-based PCM-1630 system.

Described as an "audio Erector Set," a joint venture between Peavey Electronics and Peak Audio was unveiled. Known today as MediaMatrix, the system combined an I/O connection box with an IBM PC and plug-in cards providing DSP horsepower for mixing, gating, EQ, compression, crossovers and delay. Users could design a system simply by dragging icons of various components (gates, preamps, etc.) into the desired configuration and drawing lines using a mouse. Although intended for contracting applications, MediaMatrix provided a glimpse into the studio environment of the future.

1994

The Old and the New

The concept of third-party software "plug-ins"—bringing new functions and features to existing programs—caught on with non-audio software, such as PhotoShop and Quark Express. With the rising number of Digidesign systems worldwide, software developers expanded the market with audio plug-ins for Sound Designer II and Pro Tools applications, and companies such as Waves, Jupiter Systems and Arboretum Systems jump-started this new industry. Later in the year, Digidesign shipped its TDM system—the open-architecture, 256-channel, 24-bit digital audio bus for Pro Tools—opening even more opportunities for plug-in developers.

Yamaha created a stir with its ProMix 01, an under-\$2,000 automated digital mixer with moving faders and recall automation. Meanwhile, Britain's Tony Larking (TL Audio) began offering tube consoles: The Valve 8:2 was a rackmount model; the 1000 Series was a configurable split/in-line design, with 24 buses and up to 72 input modules.

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Pioneer unveiled a pro 96kHz DAT machine, the D-9601, which recorded at 96/88.2/48/+4.1/32 kHz.

MDM activity heated up: Sony's PCM-800 adopted the DTRS (Tascam DA-88) format. Panasonic announced its ADAT-format recorder.

Twelve years before, the PCM-F1 brought digital recording to the masses, storing a stereo 16-bit audio signal on videotape. Just announced was Rane's PaqRat, storing a stereo 18/20/24-bit AES/EBU signal on an ADAT or DA-88 recorder. PrismSound's MR-2024T stored six channels of 20-bit or four channels of 24-bit audio on a DA-88.

Despite the MDM hoopla, the high

end continued unabated: Studer and Sony reported steady sales of DASH 48-tracks. AT&T and Harrison announced the development of an integrated digital console, based on AT&T's DISQ Digital Mixer Core engine and Harrison's Series Twelve and MPC consoles. SSL unveiled Axiom, its first large (+8- to 96-channel) digital console, with internal signal processing and LCRSS busing. Axiom's Disk-Track™ was a disk-based recording/editing system with up to 95 simultaneous channels.

New surround formats? Otari's PicMix added film mix monitoring to any studio console. Six joystick pan-

1994

► Milestones

Digidesign intros TDM bus
Pioneer debuts 96kHz DAT

► Beginnings

Joemeek Audio
Technomad

► Anniversaries

70th—Beyer
50th—Ampex
20th—Akai
20th—Ashly Audio
20th—DOD
20th—Furman Sound Service
20th—Jensen Transformers
20th—TOA USA
20th—Wireworks

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1995: RSP Project X

1995

The Big Buzz

RSP Technologies debuted Project X, a \$40,000 large-format digital console with ADAT or DA-88 interfacing. A desktop surface controlled audio and DSP functions in a separate rack. Features include recall of all console settings, dynamic SMPTE-based automation, and onboard DSP. Amek entered the digital mixer milieu with its Digital Mixing System, based around a hardware surface that controls a rackmount DSP core, audio I/O section and optional matrix routing.

Sony demod the OXF-R3 console, its all-digital, 24-bit wonder. More than just another megabuck console, the OXF-R3—combined with other Sony innovations, such as the PCM-9000 optical disk mastering recorder—provided a glimpse into the 20- and 24-bit re-



1995: Yamaha O2R: the affordable digital console.

ality that is on its way.

Yamaha showed its under-\$10,000 O2R 20-bit 8-bus console, offering 24 analog inputs and 16 digital tape returns for a total of 40 inputs, with four card slots accommodating ADAT, DA-88, DAT and AES/EBU signals. Standard were moving faders, instantaneous reset of all console parameters; limiter/compressor/gate on every channel and output bus; and two internal effects processors. Pair it up with a couple of MDMs, and the notion of the all-digital studio was no

longer a fantasy.

The changing face of recorders arrived with the second-generation Alesis ADAT XT (along with the similar Fostex CX-8 and Panasonic MDA-1), offering improved transport control and lockup, assembly editing and an alphanumeric fluorescent display with running time accurate to $\frac{1}{100}$ second. Akai's successful DR4 and DR8 disk recorders were followed up by its 16-track DR16 (\$4,995), which added a built-in digital mixer, with control of levels, panning, master outputs, two effects sends and the L/R bus—all controllable via MIDI or held in one of 99 snapshots. Nagra previewed a compact portable deck that records on solid-state PCMCIA cards.

Digital dubbers? TimeLine's MMR-8 was the first modular digital 8-track recorder based on magneto-optical technology. Fairlight celebrated its 20th anniversary by announcing a disk-based film dubber system, targeted at \$1,500 per track, recording to hard disks or removable MO media. Akai was also showing its dubber, based on the DR8 technology. And SoundStar announced its version, the Digital Machine System, based on

Spectral's PRISMA digital audio engine.

Neumann unveiled the M149, a large-diaphragm tube mic, the first to offer a transformerless output combined with vacuum tube electronics.

And tubes kept getting hotter: At AES 1995, more than 25 companies dis-

1995

► Milestones

DVD introduced

► Beginnings

Earthworks

PreSonus Audio Electronics

Quantegy

Ultimate Ear

► Anniversaries

70th—Shure

50th—JBL

50th—Sennheiser

25th—Allen & Heath

25th—Burlington Recording Media

25th—Cal Switch

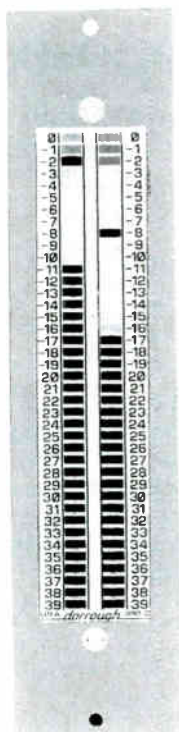
25th—Calrec Audio Ltd.

20th—Aphex

20th—Fairlight

20th—Harrison Systems

20th—Neutrik



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World Radio History

MIX 20TH ANNIVERSARY 121

played equipment using vacuum tube technology: AKG, Anthony De Maria Labs, Aphex, ART, Blue, Bruel & Kjaer, Curtis Technology, dbx, Demeter, Digi-Tech, DOD, Drawmer, G-Prime/Micro-Tech Gefell, Groove Tubes, Inward Connections, Manley, Neumann, Peavey, Retrospec, Rolls/Bellari, RSP/Rocktron, Sony, Studer, Summit, TL Audio, Tube-Tech and Voce.

Ironically, the biggest buzz of the year wasn't products at all, but the number of companies announcing home pages and Web sites on the Internet.

1996

A Whole New World

With the popularity of MIDI, MDMs and low-cost digital, the once-clear lines between the worlds of pro and semipro recording were thoroughly blurred, especially when companies that don't cater to the music-store crowd—such as Amek, Focusrite, HHB, Manley, Meyer, Otari and TC Electronic—exhibited at NAMM.

Affordable digital is here to stay. Roland's VS-880 Digital Studio com-

bined a disk-based 8-track recorder/editor with a 14-channel digital mixer and two optional effects processors. It's offered with the soon-to-be-a-standard Iomega Jaz 1GB removable drive at \$2,795. Compatible with its



1996: Roland VS-880

DA-88, Tascam's DA-38 is a \$3,499 DTRS-format MDM recorder.

Once labeled Digital Video Disc, DVD becomes the Digital *Versatile* Disc, but two years in the future, there still is no DVD-Audio standard. Ready for the eventuality of high-bit-rate audio, Sony unveiled its PCM-3348HR

24-bit/48-track DASH-format recorder.

Old wine in new bottles: Southern California-based Martin Sound purchases Neotek and Anatech (a British company with a remarkable in-line console in development).

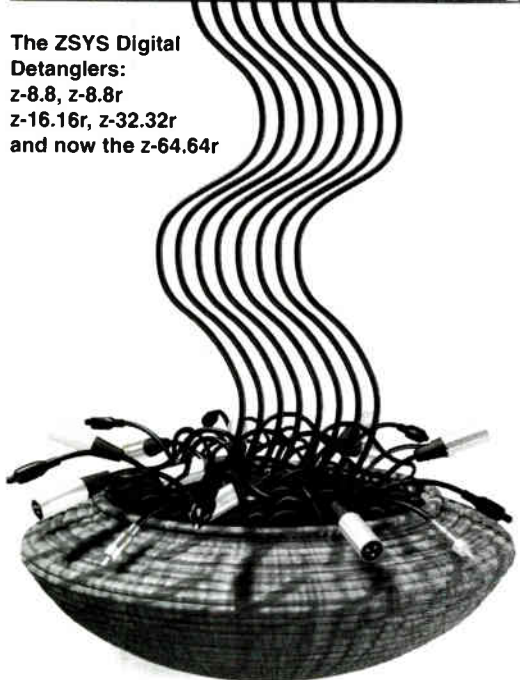
Affordable disk-based video for audio post arrived with Doremi Labs' V1 (\$5,995) video recorder offering tape recorder-style front panel controls, a variety of compression ratios, removable media and compact rack-mount packaging.

MiniDisc found a niche as a format in inexpensive (\$1,200-1,500) 4-track digital recorder/mixers such as the Yamaha MD4, Sony MDM-X4 and Tascam Digital PortaStudio 564. All feature 37 minutes of recording, MIDI sync, cut/paste editing and a write-after-read mode for bouncing four tracks onto two of its own tracks.

The digital mixers kept rolling out: Korg's SoundLink DRS 168RC (\$3,500) is a 16x8x2 digital console with ADAT and S/PDIF I/O. Priced in the \$30-40k range was Soundtracs Virtua, a fully digital 64-channel mixer with dynamic automation, snapshot recall and LCRS panning. Tascam showed an "under-\$10,000" digital mixer prototype, offer-



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1996

► Milestones

First MiniDisc multitracks

► Beginnings

City Music Fixtures

Diamond Audio

Euphonix acquires

Spectral

EVI Audio

Liquid Audio

Special Projects

Uncut Audio Corp

Wave Distribution

► Anniversaries

50th—Klipsch Professional

50th—Switchcraft

50th—Tektronix

25th—American Data

Services (Lexicon)

25th—DAS Audio

25th—dbx

20th—AMS

20th—Bag End/Modular

Sound

20th—Hafler

20th—HHB Communications

20th—Nady Systems

20th—Symetrix

20th—TC Electronic

ing two 24-channel strips for a maximum of 40 TDIF (DA-88/DA-38) inputs on mixdown, with 16 analog mic/line inputs. Yamaha's 03D (\$4,000) was shown as a scaled-down version of the 02R, with 24 inputs, four buses and two internal effects processors.

And anyone who thought 16 (or 20 or 24) bits were sufficient needed to hear dbx's Blue Series A/D converter. Based on a 27-bit process, it offered a choice of onboard noise-shaping approaches, including the ability to create NS curves using a graphic EQ-style interface.

Numerous companies were offering audio on demand on the Internet, but Liquid Audio did it right. The audio is excellent, based on a software version of Dolby Digital AC-3 compression. At AES Los Angeles, Liquid Audio showed a mastering/file prep package and server software, which delivers high-quality audio over the net for transactions, and automatic royalty tracking/reporting via e-mail. Systems such as Liquid Audio could create new distribution avenues for low-volume, special interest or specialty releases—or, provide the instant-access record store of the future.

1997

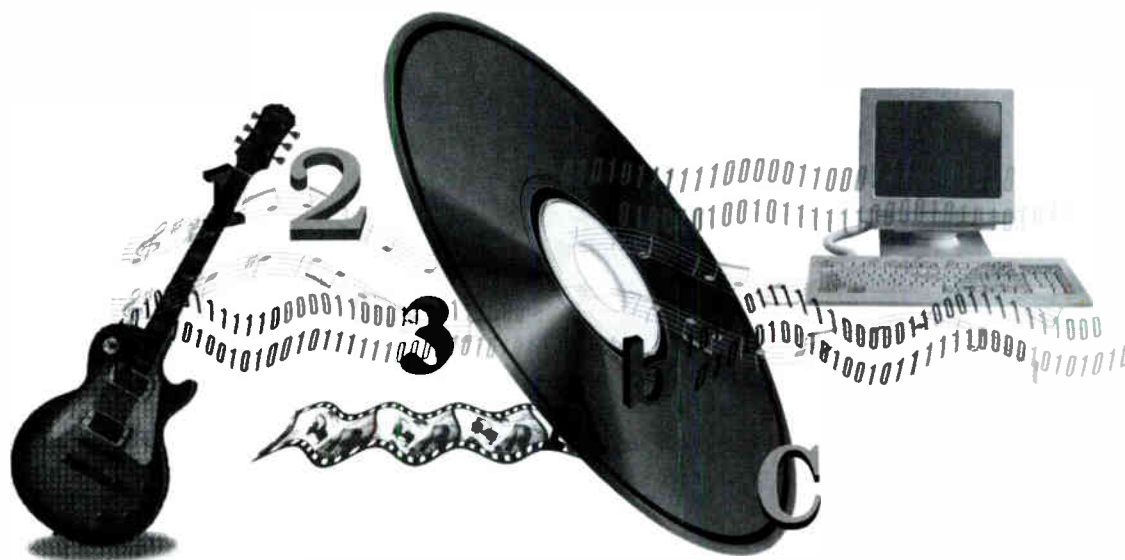
The Shape of Things to Come

So, having looked at where we've been, what's in store for the years ahead? The answer, perhaps, lies in the product introductions we've already seen so far this year.

This year will see more new digital consoles—in all price ranges—than came out in the 15 years between 1977 and 1992. Digital console introductions in 1997 so far have included the 48x8x2 Mackie Digital 8•Bus (\$8,000); Soundtracs Digital Production Console, with 64 or 96 moving faders and multiple touchscreen interfaces; and Solid State Logic's high-performance Altimix, providing mixing, networking, disk-recording/editing and random-access video. All provide onboard DSP, integral dynamics on all channels, moving faders, automation of *everything*, extensive transport control via MMC or Sony 9-pin, multiformat output buses (5.1, LCRS, etc.)—all as standard equipment.

Six months ago, the workstation

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market had seemingly leveled out. Now, with new players offering systems and numerous I/O cards available, the workstation world will be more interesting in the years to come, especially as the PCI bus enables a new cross-platform (Mac/PC) hardware standard. So far, products such as the Event Layla, Digital Audio Labs V8, Lucid Technology's PCI24, Ensoniq Paris, Korg 1212, Digidesign Audiomedia III and Emagic's Audiowerk8 all point to more affordable solutions for studios.

MDMs will continue their meteoric rise in sales, fueled by new designs, such as the Alesis Meridian, Studer V-

Eight and Tascam's DA-98. And disk-based 8-tracks, such as the MO units from Genex and Augan, are showing the form that tomorrow's recorders will take. Once rewritable 10GB MO disks are \$10 and available at Walgreen's, we'll see the *real* revolution, where digital tape recorders join the Elcaset decks and underdash 8-track players found at garage sales.

Outboard gear doesn't have to look like outboard gear anymore: Power Technology's DSP/FX effects processing system turns a PC into a digital multi-effects box with 32-bit resolution and screen-based control of all parameters via a hardware card

and PC/Windows-based software. Lexicon's new Lexicon Studio™ is a hardware/software system offering I/O, DSP, routing, sync and control hardware for leading software packages based on PC or Mac. And for those who want access to the power of software plug-ins in real-time situations, the Galim Signal Processing System from Waves offers modular, computer-based multi-effects and real-time audio processing in a four-rackspace unit integrating Pentium or Power PC hardware.

The recording industry now faces challenges in how the present studio environment will handle the needs of 88.2/96kHz, 20/24-bit consumer systems. That issue can be addressed by using some of the available present-

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1997

- ▶ **Milestones**
DVD-Audio standard develops
- ▶ **Beginnings**
Emtec Magnetics (BASF)
- ▶ **Anniversaries:**
50th—AKG
25th—Automatic Inspection Devices (Integral Vision)
25th—CAE/Littlite
25th—D&R
25th—Dorrough
25th—E-mu Systems
25th—Eventide
25th—Sound Out Laboratories (Soundtracs)
25th—Tapco

day tools and eventually upgrading for the future.

A more interesting aesthetics issue is how we, as engineers and producers, plan now for (and adapt to) the coming of 5.1-channel surround sound. Will our first releases be like the roller-coaster stereo demonstration records of the 1950s? Are the surround channels merely a place to dump the rear room ambience to provide the "concert hall" experience? Do we mix so the listener is sitting in the center of the band? How do we deal with our surround mixes' mono (or stereo) compatibility? And if monitoring decisions are difficult enough today in stereo, then how do we deal with the guesswork of wondering what kinds of system our audiences have at home or in the car? We may not have all the answers yet, but I have a feeling we're in for a fun ride. Bet on it. ■

—FROM PAGE 110

going to be a much, much larger audience whose expectations are going to be lower and lower. People are going to accept less and less because the dynamic range on radio is getting smaller as radio stations try to compete more. There already isn't any real dynamic range on television. And the dynamic range and frequency range on the Internet, no matter what we end up with, is always going to be dreadful.

There's going to be a tremendous push to make this acceptable to people, and I think people will begin to accept it because they will be spending so much time listening to it that they'll absorb it—"Okay, this is the way it is." I think people don't even have the time to sit down and listen to CDs much anymore. I think most people are listening to audio in conjunction with something else, whether it's watching television or fooling around on their computers or driving their car. And all three of those things are not conducive to high-quality audio, especially driving in the car. What's your

available dynamic range in the car? Maybe 15 dB? I think that as people become more and more multitasking-oriented, audio will be a more back-seat kind of thing. I think the lower-end studios with the lower-end production markets are going to be geared toward that, and they're going to be geared toward turning out stuff in which the quality doesn't really matter that much—what matters is the punch and the fact that it gets the message across. Whereas there are going to be a few studios that are going to be very high-end that will be mixing sound for movies and for surround sound, and there's always going to be that core audience that wants that.

Craig Anderton: Obviously, digital's here to stay, and the higher sampling rates and the larger word lengths are foregone conclusions, which will make it a lot better. But to me, the really interesting thing about digital audio is that it allows for analysis of music and sound in a way that's never been possible before. What I think and hope we're going to see is more studies that

deal with the *qualitative* nature of sound, rather than quantitative. We have plenty of quantitative data on the subject but very little on what makes sound magical or what makes it trigger memories in people, or even why it supposedly has healing powers in some instances—things like that. Now we have the tools to analyze it in ways that never existed before—different tunings on keyboards; sophisticated spectral analysis that was never possible before; there's filtering and things where you can really isolate individual components, screw around with the sound and determine different things about the sound in a controlled setting. Obviously, it's now possible to synthesize a whole lot more sounds digitally than it was 20 years ago. Additive synthesis is something that's now feasible thanks to digital technology. So all these things that have been sort of dormant in the wings are now possible. FM synthesis started the whole thing off when it made it out of the universities and into the bar down the street, so to speak. We're going to see more of that esoteric stuff filtering down. It used to be that no one had a spectrum analyzer unless you could

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afford a big Hewlett-Packard box that cost like ten grand. Now you buy a \$200 software wave-editing program and it has a spectrum analyzer in it.

So I think in a lot of ways, the interest and excitement is going to be involving sound rather than audio, *per se*. And applications of sound. One good example is quantization. When quantization first appeared on sequencers, people thought, "Oh great, now we can have perfect rhythm," only to find out that perfect rhythm is not what we want. It's the same thing with pitch correction. I'm starting to think that tuning is a much more plastic medium than we thought. Look at blues guitarists who, when they bend up to the octave from the seventh, never quite make it all the way. These are things we've taken for granted until now partly because, until recently, you couldn't measure to see, for instance, how much [drummer] Steve Gadd was advancing the hi-hat compared to the rest of the beats, or that kind of thing. As we have these tools, we're going to be learning a ton of stuff; some really fundamentally important things about music—like, tempo is a suggestion, not an order; pitch is a suggestion, not an order; and microtonal tunings may have a real basis. So that's what I think is going to be interesting to watch. And, of course, a lot of it is software/computer-driven. The processing power in computers these days is just so astonishing that it makes all this possible.

Murray Allen: Ten years ago, the germ of the whole move to home studios was well under way, so we knew that ultimately the home studio would expand and the so-called project studio would become a major player. We also knew that because of what was happening with computers even back then, the quality and the ability for more people to get involved in creating final product was on the drawing board. The thing that surprised me a little bit was that the quality people would accept as okay would drop as much as it did. In other words, we always knew that professional composers and engineers created a certain quality of product. As it became easier for more people to get into the act, so to speak, the people who are the purchasers, who in some cases don't have the taste or understanding of what really good is, sometimes bought mate-

rials that were less than great. I had already seen that take place in the video world, when video-assist was developed and there was a deterioration in what was happening with video because people who weren't schooled from start to finish and never put in apprenticeships were getting involved. At the same time, for the people who were knowledgeable and had paid their dues and had talent, it gave them a greater ability to be creative.

Equipment is going to keep getting less expensive. Those of us who are quality nuts—who have devoted our whole lives to creating the Rolls Royces of audio—are facing people who are talking about Internet audio, which I'm involved with, too, and where everything is compressed and people are getting used to even lesser-quality audio. It's very much like when people would take a cassette and copy it three or four times and give it to their friends. It was like, "Why are we spending all this time making great records, when it's being copied on inexpensive home machines and being passed around?" I guess what that goes to prove, and we've always known this, is that content is what counts to the consumer. If it's a good song and the artist performs it well, people don't really care if there's a little noise on it or the top end is gone or if there's a little bit of wow on it.

The other thing I believe, and I've talked to record companies about this, is that in a couple of years every audio record will also have some picture involved with it. In other words, the marriage of audio and video—"multimedia"—is going to be the mainstream. It will probably be on DVD. There will be stand-alone DVD records for the purists, where we have great 6-channel sound or whatever—pure audio at 96k sampling rate, things of that sort. But I think the mainstream will be more involved with multimedia, one way or the other. And when that happens, we know the audio will probably be compressed a little bit more.

Toby Mountain: I think most of what I believed about the importance of computers has come true. I came into digital mastering with the computer age from an academic background, so I saw what computers were capable of, and I saw that coming. By 1987, too, there were enough initial start-ups

that it was clear that was the way it was going. In terms of DVD, I don't think anybody could have prophesied that. I think some people thought, "Well, now we've got the CD. The next step will be some credit card-size music carrier in 15 or 20 years." People were talking about bubble technology and other things, but I'm not sure many people specifically foresaw DVD. As far as mastering itself goes, I don't think people really envisioned the amount of power that we would have and breadth and scope and the ability to change things—things like NoNoise and digital processing and getting into the high-resolution stuff, like 24-bit. I don't think people thought we would revise the CD standard, *per se*, even though there was some dissatisfaction with 16-bit. I think some people were willing to discard digital altogether and forge on with analog—and some people did do that. Others have learned to live with it and use it how they want to their own advantage, mixing it with analog and so on. In mastering, digital pretty much reigns now because most of the equipment mastering engineers are using now is digital, at least at some point, because obviously they have to send it off in a digital format.

Whether DVD is successful or not, I think the next big change will be that the music-only album is pretty much dead, and what we'll see change in the next five years will be that most things will come out on some music-plus format; in other words, music with multimedia, music with graphics, music with video. Even though the enhanced CD has not been particularly successful, that's just the beginning. It was a poor start, but there's much more to come, and if DVD takes hold you're going to see a lot more movement in the direction of presenting music in a different context. It's going to be awhile for the record industry to adopt DVD as a format, but I think it eventually will. DVD will be kick-started by the DVD-ROM industry, and the computer industry in a way is kick-starting everything else.

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Stephen St. Croix: Anybody who's been in the public eye and done predictions, and I've done both for some time, would be tempted to say, "Of course I knew all this was going to happen. I knew it was going to be 16-bit, and I knew it was going to suck. And I knew it was then going to be 24-bit and I knew we were going to go 96kHz." The truth is, when I first heard digital, I was in L.A. with Stevie Wonder. I think we were working on *Songs in the Key of Life*, and what we had was a Sony 1610, and around the same time I'd gotten a Sony 2000 Beta deck with a Sony 601 PCM interface, and then the Nakamichi DMP-100. These were the first 16-bit linears, and those were the days when 16 bits of audio were 16 levels of pain. They really were—you were actually hoping the next bit wasn't going to come along because it was probably just going to hurt some more. And even then, as horrible as everything sounded—it was like BBs in a broken glass—I turned to Stevie and said, "This is all there's gonna be." And Stevie said that wonderful thing he al-

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ways says: "Uh-huh!"

And even when I got my Delta T delay from Lexicon that Chris Moore designed—8-bit linear—and it sounded really bad. I listened to that and said, "Oh this is it! This is the only way it's going to go. All they have to do is make it sound good. There have to be some breakthroughs in removing the edges in conversion."

So, yeah, I saw digital as the future. What I didn't see, what I never would have guessed, is that the state of video quality would stay so suppressed for so long. I am astounded we live in a world of 400 theoretical scan lines, and you get half of them on your doorstep if you're really lucky. This is an embarrassment. There's no technical reason for this, of course. It's all economic and political. But the fact is, we don't have TV that doesn't give you a headache. We now have digital audio that is beginning to work. I can actually go out and buy a CD and listen to it without throwing up. I can't do that with video. DVD is really the first step toward abandoning archaic analog TV. We just have to give it up.

DVD, even with its crappy compression, as long as you're not trying to overcompress, blows the doors off of even videodisc because it's not analog.

We're in a time when huge, roll-off-your-chair-and-roll-around-on-the-ground-laughing-with-milk-squirting-out-your-nose mistakes are being made. Look at MiniDisc. Look at digital cassette. C'mon. These things kind of make you forget that wonderful all-time joke that we played on ourselves—8-track. That doesn't seem quite so bad in the light of these more recent mistakes. But the buying public, your readers, are not dumb. The public is educated now, and you can't slip these mistakes in like you used to. Companies try these things out, and the people say, "Oh no, no. This sounds terrible. This is a move backwards." And I'm proud of the industry for starting to stand up for their rights and saying, "Wait a minute. Just because Monster Company Number One has come out with product doesn't automatically make it sound good." They don't buy it, and the product goes away. This is what I've been fighting

for in *Mix* since I joined. The buyers are taking control, and that's how it should be.

The future is clear; it's simple. I cannot see how we can deviate from this prediction. I see it to be an inescapable necessity simply because it will be driven by everything that drives capitalistic future—profitability, reliability, simplicity and sex appeal. And the prediction is this: nothing, nothing, *nothing* will move. There will be no moving parts in the audio industry. All storage will absolutely be on some form of holographic crystal—a chunk of doped glass that will support quantum jumping or do an opacity or a chemical change when exposed to laser. So you scan 'em and write and scan 'em to nondestructively read. No power supplies, no refresh. It's just like the science fiction shows—like in *Star Trek* and *Deep Space Nine*, when somebody hands someone a crystal and says, "Here's the data you wanted." Terabytes in a sugar cube. When I started writing about this years ago, it was a dream, but now it exists. Two companies are actually making prototype interference solid-state memory now. So that's where we're going to go. We will be recording directly to this removable media! And that's the short-term—five years. Long-term, it's going to come to a fork—biological or inert memory, and I can't predict which way it's going to go.

Also, the audio industry as a business will eventually realize it can't go on stealing market share from itself indefinitely, and it's going to want to grab share from the real world, so it's going to move down-market using technology's greatest special effect: making insane amounts of power for embarrassingly low sums of money. I truly see a minimum-physical-interface recording studio. I think we are going to be sitting in an air-conditioned room with goggles and data gloves on, grabbing a chunk of audio floating above us with our right hands and another piece with our left hands, and sticking them together and instantly hearing the splice. I am betting my future involvement in this industry on it going that way; I believe in it that strongly. I'm actively researching true virtual environments. I think we could be working in fully virtual environments in about seven years, with it becoming really competitive in 12—when it's reliable and not just another technology freak show. ■



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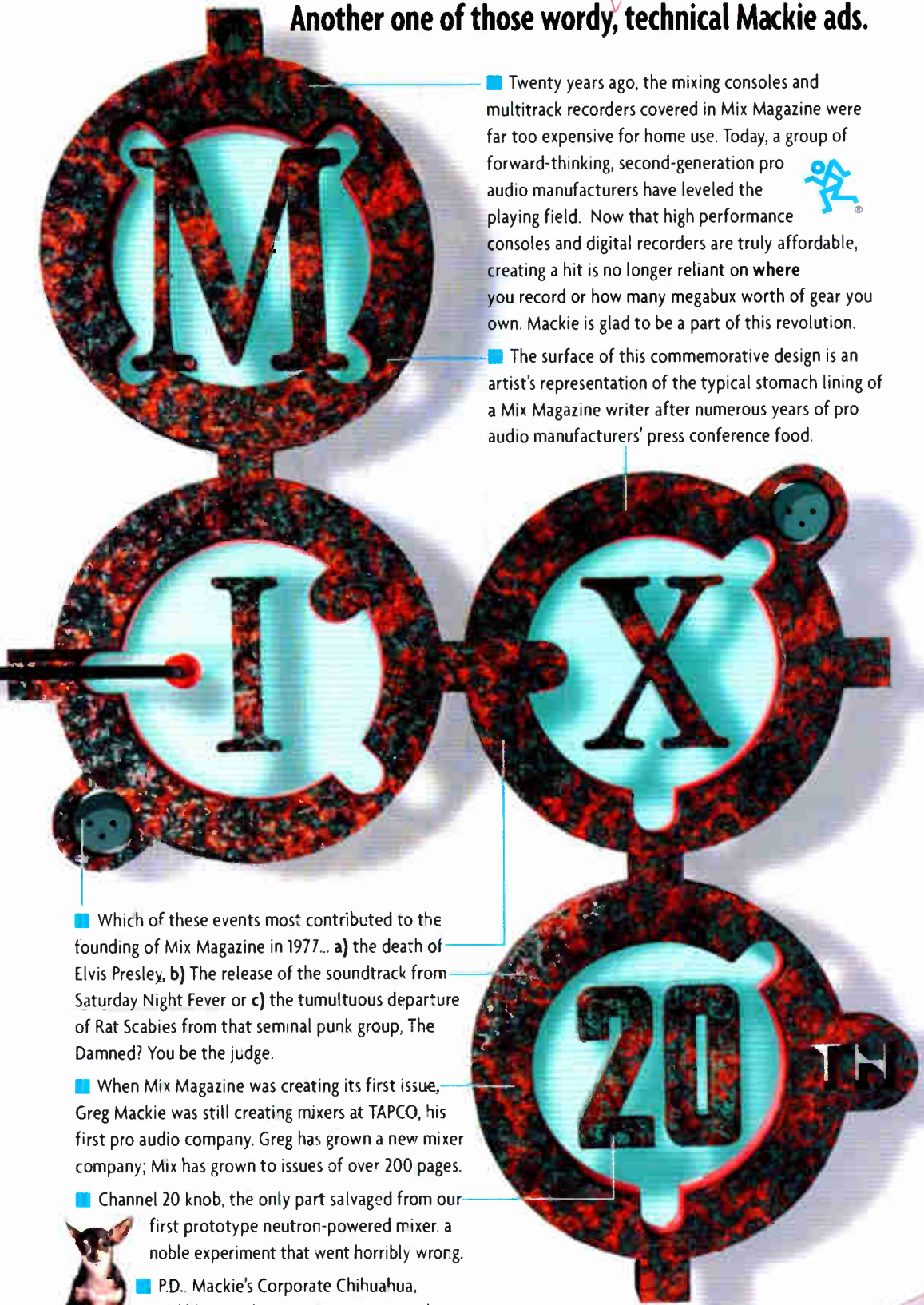
DCE
DAVID CARROLL ELECTRONICS, INC.
3219 PIERCE ST., RICHMOND, CA 94804
510/528-8054 • FAX: 510/526-1982

CIRCLE AD NUMBER ON PRODUCT INFO CARD

CONGRATULATORY

congratulatory

Another one of those wordy, technical Mackie ads.



■ Twenty years ago, the mixing consoles and multitrack recorders covered in Mix Magazine were far too expensive for home use. Today, a group of forward-thinking, second-generation pro audio manufacturers have leveled the playing field. Now that high performance consoles and digital recorders are truly affordable, creating a hit is no longer reliant on **where** you record or how many megabux worth of gear you own. Mackie is glad to be a part of this revolution.

■ The surface of this commemorative design is an artist's representation of the typical stomach lining of a Mix Magazine writer after numerous years of pro audio manufacturers' press conference food.

■ Which of these events most contributed to the founding of Mix Magazine in 1977... a) the death of Elvis Presley, b) The release of the soundtrack from Saturday Night Fever or c) the tumultuous departure of Rat Scabies from that seminal punk group, The Damned? You be the judge.

■ When Mix Magazine was creating its first issue, Greg Mackie was still creating mixers at TAPCO, his first pro audio company. Greg has grown a new mixer company; Mix has grown to issues of over 200 pages.

■ Channel 20 knob, the only part salvaged from our first prototype neutron-powered mixer, a noble experiment that went horribly wrong.



■ P.D.. Mackie's Corporate Chihuahua, would like to salute Mix Magazine on what she perceives to be their 140th anniversary.

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World Radio History



Below: a few of the 400+ folks at Mackie Designs who wish Mix Magazine a happy 20th Anniversary

**Most Tour Sound Systems
Take Years to Become Classics.
Some Are Just Born That Way.**

Introducing the Revolutionary New HLA Series Loudspeakers.

Once in a great while, an idea comes along that can be considered truly revolutionary. Well, it's once-in-a-great-while-time again. Introducing the HLA Series and its centerpiece, the 4895 Three-Way -- a metamorphosis in tour sound technology from JBL Professional.

At the heart of the series are two DCD drivers, a 10" and a 14", which offer the ultimate in performance at as little as 7 lbs. per driver.

This is accomplished with a new Neodymium magnet design and new voice coil topology which vastly reduce the need for steel. Dual Coil Drive was chosen because it has two magnetic gaps and two voice coils in each driver. This doubles their power-handling capabilities.

To provide each listener with better quality sound, JBL engineers designed a new, three-way MultiBand Waveguide™, powered by the two DCD drivers in a composite magazine with a large format compression driver. The composite magazine gives the drivers the rear compression load required to balance the acoustic resistance furnished by the waveguide. To minimize distortion, Optimized Aperture™ technology is used to

supply the longer path length required for precise pattern control. To make the most of this increased efficiency, we then placed the entire system in our patented SpaceFrame™ enclosure, which allows it to be easily tilted and aimed to give the audience even coverage with minimal overlap.

To keep pace with this extended performance, the HLA Series also features our powerful 4897 Subwoofer, which has an innovative composite enclosure made of carbon fiber and aluminum and new port technology. The net result is 3dB more output than any other 18" system in existence and dimensions conveniently equal to the 4895.

Put all its remarkable components together and the HLA Series represents a radical departure from any professional sound reinforcement system currently in use -- one that offers unparalleled flexibility, ease of setup and the most seamlessly uniform coverage ever. With this revolutionary, new tour sound system, JBL has given a whole new meaning to the already universally respected "JBL Loaded". If professional sound matters to you, write to JBL Professional or visit our website at jblpro.com. A change for the better never sounded so good.

4895 Three-Way



**HLA
Series**



Tilting the Balance

JBL Professional
8500 Balboa Boulevard
Northridge, CA 91329
www.jblpro.com

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