A SUPPLEMENT TO MIX MAGAZINE

20 TEC

CELEBRATING AUDIO EXCELLENCE
1985 2004

INTRODUCING
TECnology Hall of Fame

- *The Birth of the TEC Awards*
- *The TEC Almanac*
- *Healthy Hearing*

A PRIMEDIA Publication

World Radio History

Meyer Sound TEC Award Nominations

1985
Meyer Sound Labs MSL-3 Loudspeakers
Sound Reinforcement Technology

1986
Meyer Sound Labs Source Independent Measure (SIM)
Acoustics Technology
Meyer Sound Labs CP-10 Complementary Phase Parametric
Sound Reinforcement Technology

1989
Meyer Sound Labs MSL-3 Loudspeakers
Ancillary Equipment

1990
Meyer HD-1
Transducer Technology

1992
Meyer VX-1 Equalizer
Signal Processing Technology

1993
Meyer Sound Labs MSL-2A
Sound Reinforcement Loudspeaker Technology

1994
Meyer Sound Labs MSL-5
Sound Reinforcement Loudspeaker Technology

1995
Meyer Sound Labs HD-2
Studio Monitor Technology

1996
Meyer Sound Labs MTS-4
Sound Reinforcement Loudspeaker Technology

1997
Meyer Sound Labs CQ-1/CQ-2
Sound Reinforcement Loudspeaker Technology

1998
Meyer MSL-6
Sound Reinforcement Loudspeaker Technology
Meyer SB-1 Self-Powered Loudspeaker System
Sound Reinforcement Loudspeaker Technology
Meyer HM-1S
Studio Monitor Technology

1999
*Meyer PSW-6 Cardioid Subwoofer
Sound Reinforcement Loudspeaker Technology

2000
Meyer Sound UPM-1P
Sound Reinforcement Loudspeaker Technology

2001
Meyer Sound Labs X-10
Studio Monitor Technology

2002
Meyer M3D Line Array
Sound Reinforcement Loudspeaker Technology

2004
Meyer Sound MILO
Sound Reinforcement Loudspeaker Technology

*denotes a TEC category winner

judging by the past the

*To find out more about the MILO curvilinear line array, visit www.meyersound.com/milo

World Radio History

MIX®
mixonline.com
A PRIMEDIA PUBLICATION

PROFESSIONAL RECORDING
SOUND & MUSIC PRODUCTION

Associate Publisher
Erika Lopez TEL (818) 249-6809
EMAIL elopez@primediabusiness.com

Northwest/North Central
Greg Sutton TEL (847) 968-2390
EMAIL gsutton@primediabusiness.com

Southwest
Albert Margolis TEL (949) 582-2753
EMAIL amargolis@primediabusiness.com

East Coast/Europe
Michele Kanatous TEL (718) 832-0707
EMAIL mkanatous@primediabusiness.com

Classifieds
Kevin Blackford (West Coast)
Jason Smith (East Coast)
800/544-5530 or 510/653-3307
mixclass@primediabusiness.com

What makes *YOU* read a magazine?

Don't think about *Mix* for a second. Think about the one magazine that you can't wait for the mailman to deliver each month. Yeah, that one. The one mag that strikes a chord in you, engages you and brings out your passion for something. Whether it is investing, snowboarding or Martha Stewart, you must have one subject and magazine that you like above all others. ***Playboy*** doesn't count. I would just ask you to look inside yourself and ponder for a minute.....WHY.

We have magazines we have to read and magazines we look forward to reading. There also is a distinction between how we view the reading experience and how much quality time we spend in the pages of each. And yes, this is directly tied to how we are affected by the ads. Whether we act or don't. Whether we remember the product/brand or not, I'm here to suggest that the same ads in a want-to-read book affect us much differently than ads in the have-to-read book. Let's face it, there is a level of escapism that a want-to-read book brings, and these days, it's great to get lost in subject matter that excites and stimulates us. The reader's experience there is WAY different than when he's forced to read something that is not engaging. Engage the reader with journalism, entertain him while he's there and you win. This is *Mix*'s secret! Yes, I let it out of the bag!!!

Lets see how this applies to our world and our customers....the end-users and dealers who buy the pro audio gear and services we sell. Our third-party research states that *Mix* readers, the largest sample of single pro audio magazine readers, have read on average 3.6 copies out of the last four issues of *Mix*. It also states that they have read just 1.5 out of the last four issues of *Pro Sound News* and 1.4 issues of *PAR* and less than an issue of *Tape Op* out of the last four.

Why is that?

Certainly, from a pure circulation standpoint, there are almost twice as many *Mix* readers than any of these other magazines. But it's more than that. It's the editorial approach: *Mix* = Journalism

Not just press releases

Not just reviews

Not just ramblings on the industry

JUST PURE JOURNALISM

Sure it would be easy (read CHEAP) to have a magazine that just puts out press releases or just reviews, but **IT WON'T ENGAGE THE READER THE WAY A JOURNALISTIC APPROACH WILL.** When you have a staff of writers, who in many cases have been at *Mix* for over 20 years, you form a relationship with the readers that is unmatched anywhere. Just read one Stephen St.Croix piece like this month's on page 22 and you will see what I mean. Or take George Petersen's Technology Spotlight on NHT Monitors pg 106 and you'll see the perspective and depth that more than 20 years at Mix brings to his writing style.

I propose to you, my esteemed pro audio colleagues: **This is Journalism....This is Mix**

Erika Lopez
Associate Publisher
Mix Magazine

World Radio History

World Radio History

20 TEC YEARS

future sounds great

Congratulations to the TEC Awards for honoring the best in our business for the past 20 years. Meyer Sound is proud to mark it's 25 year anniversary with another nomination* and is looking forward to the next 25 years.

CELEBRATING A QUARTER CENTURY OF GREAT PERFORMANCES

Meyer® Sound

World Radio History

Welcome to TEC 20

It seems that when a particular industry comes of age, one of the first things it does is establish an awards show to recognize the movers and shakers. Of course, someone has to actually go to the trouble and expense of launching the event, and as often as not it is a trade magazine, which is in the unique position of knowing just about everyone. And so it was, in 1985, that *Mix* launched the Technical Excellence and Creativity Awards to honor outstanding achievement in professional recording and sound.

Much like the magazine itself, starting the TEC Awards was something that turned out to be a lot more work than the publishers of *Mix* ever envisioned. After producing the last 19 TEC Awards ceremonies, there's one thing we can tell you: Outside of the military, there are few enterprises known to man that have more moving parts than an awards show. But when the last ticket is sold, the program is printed, the lights go down and the band kicks in with its intro number, it's all worth it.

There's something special about honoring a person whose work has affected us all—a Sam Phillips, a Tom Dowd, a Geoff Emerick or a Brian Wilson—and seeing that icon approach the stage to a standing ovation, feeling the appreciation that rises from the audience like a tangible entity. That's what makes the TEC Awards unique. It validates who we are and what we do for a living, and reminds us why we got into sound and music in the first place. And it inspires us to try even harder to be the best.

Thank you all for coming, and enjoy the show.

Hillel Resner
President, Mix Foundation
Executive Producer, TEC Awards

Karen Dunn
Executive Director, TEC Awards

Contents

4 The Birth of the TEC Awards

8 TEC Awards Voting Procedures

8 The Mix Foundation for Excellence in Audio

10 Lifetime Achievement Awards: The Hall of Fame and Les Paul Award Winners

12 The TEC Almanac: 20 Years in Pictures

22 Introducing! The TECnology Hall of Fame

37 The Hearing Connection: The House Ear Institute

40 The Legend of Les

Technical Excellence & Creativity

A PRIMEDIA Publication

PRESIDENT, MIX FOUNDATION Hillel Resner
MANAGING EDITOR Karen Dunn
EDITORIAL DIRECTOR George Petersen *gpetersen@primediabusiness.com*
EDITOR Tom Kenny *tkenny@primediabusiness.com*
SENIOR EDITOR Blair Jackson *blair@blairjackson.com*
SENIOR EDITOR/FEATURES Sarah Jones *sjones@primediabusiness.com*
TECHNICAL EDITOR Kevin Becka *kbecka@earthlink.net*
SENIOR ASSOCIATE EDITOR Sarah Benzuly *sbenzuly@primediabusiness.com*
ASSISTANT EDITOR Breean Lingle *blingle@primediabusiness.com*
EDITORIAL ASSISTANT Heather Johnson *hjohnson@primediabusiness.com*

SENIOR ART DIRECTOR Dmitry Panich *dpanich@primediabusiness.com*
ART DIRECTOR Lizabeth Heavern *lheavern@primediabusiness.com*
ASSOCIATE ART DIRECTOR Kay Marshall *kmarshall@primediabusiness.com*
PHOTOGRAPHY Steve Jennings
INFORMATIONAL GRAPHICS Chuck Dahmer

SENIOR VICE PRESIDENT Pete May *pmay@primediabusiness.com*
PUBLISHER Dave Reik *dreik@primediabusiness.com*
ASSOCIATE PUBLISHER Erika Lopez *elopez@primediabusiness.com*

EASTERN ADVERTISING DIRECTOR Michele Kanatous *mkanatous@primediabusiness.com*
NORTHWEST/MIDWEST ADVERTISING MANAGER Greg Sutton *gsutton@primediabusiness.com*
SOUTHWEST ADVERTISING MANAGER Albert Margolis *amargolis@primediabusiness.com*

CLASSIFIEDS/MARKETPLACE ADVERTISING DIRECTOR Robin Boyce-Trubitt *rboyce@primediabusiness.com*
WEST COAST CLASSIFIEDS SALES ASSOCIATE Kevin Blackford *kblackford@primediabusiness.com*
EAST COAST CLASSIFIEDS SALES ASSOCIATE Jason Smith *jasmith@primediabusiness.com*

MARKETING DIRECTOR Christen Pocock *cpocock@primediabusiness.com*
MARKETING MANAGER Angela Rehm *arehm@primediabusiness.com*
MARKETING TRADESHOW COORDINATOR Megan Koehn *mkoehn@primediabusiness.com*
ONLINE SALES AND MARKETING DIRECTOR Samatha Kahn *skahn@primediabusiness.com*

DIRECTOR, SPECIAL PROJECTS Hillel Resner *hresner@primediabusiness.com*

VICE PRESIDENT, PRODUCTION Lisa Parks *lparks@primediabusiness.com*
GROUP PRODUCTION MANAGER Melissa Langstaff *mlangstaff@primediabusiness.com*
SENIOR ADVERTISING PRODUCTION COORDINATOR Liz Turner *lturner@primediabusiness.com*
CLASSIFIED PRODUCTION COORDINATOR Jennifer Kneebone-Laurie *kneebone@primediabusiness.com*

SR. DIRECTOR AUDIENCE MARKETING Susi D. Cordill *scordill@primediabusiness.com*
GROUP AUDIENCE MARKETING DIRECTOR Phil Semler *psemler@primediabusiness.com*
AUDIENCE MARKETING MANAGERS Jef Linson *jlinson@primediabusiness.com*
Craig D'amantine *cdamantine@primediabusiness.com*

HUMAN RESOURCES DIRECTOR Julie Nave-Taylor *jnave-taylor@primediabusiness.com*
RECEPTIONIST/OFFICE COORDINATOR Lara Duchnick *lduchnick@primediabusiness.com*

COPYRIGHT 2004
PRIMEDIA Business Magazines & Media Inc.
ALL RIGHTS RESERVED.

FOUNDED IN 1977 BY DAVID SCHWARTZ AND PENNY RIKER

TEC Awards and Technical Excellence & Creativity Awards are registered trademarks of the Mix Foundation for Excellence in Audio.

World Radio History

SL4000

XL 9000 K•SERIES

Modern Audio Production Defined

When Solid State Logic introduced the SL4000 console at the 1977 AES Convention, audio production was changed forever. Mix parameters and tape machine transports came under integrated computer control, and producers and engineers enjoyed a previously unimaginable degree of control over signal routing and dynamics.

This innovative thinking continues to drive SSL forward. The XL9000 K Series, with unique SuperAnalogue circuitry and powerful surround tools, sets new standards in creative audio performance for emerging production formats such as DVD-A and SACD.

Now the AWS 900 continues this tradition. A revolutionary integrated console combining a fully featured SuperAnalogue signal path with a comprehensive DAW controller, it provides everything you need to record, edit and mix professional projects when used with the workstation of your choice.

Celebrating the proud occasion of the SL4000's induction into the Mix TECnology Hall of Fame, we say thank you for the continuing support of more than 3000 SSL-equipped facilities around the world.

Solid State Logic

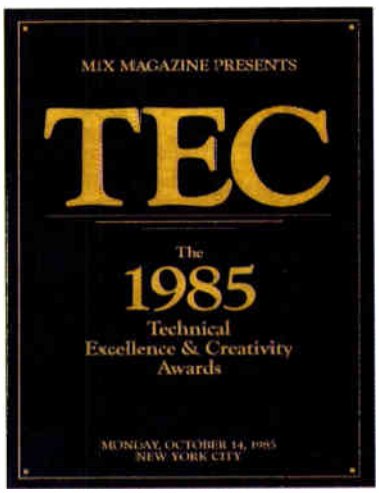
Oxford +44 (0)1865 842300 New York +1 (1)212 315 1111
Los Angeles +1 (1)323 463 4444 Paris +33 (0)1 3460 4666
Milan +39 039 2328 094 Tokyo +81 (0)3 5474 1144

www.solid-state-logic.com

World Radio History

Honoring Excellence for 20 Years

By Hillel Resner



It started out, as many successful products or projects have, as nothing more than an interesting idea. This particular idea belonged to David Schwartz and Penny Riker, the publishers and co-founders of *Mix*, who had amasssed a pretty successful string of good ideas at the time. The year was 1984, and *Mix* was just seven years old—not yet the Number One magazine for audio professionals, but well on its way and always looking for ways to make a splash, to do something that no one else in the industry was doing.

One day, Schwartz was lunching with audio pioneer John Meyer, the founder of Meyer Sound Labs (a *Mix* neighbor in Berkeley, Calif.) and one of the most inquiring minds in pro audio. The two were talking about how professionals could tell the great inventions from the so-so, when Schwartz suggested, "What if we were to start an awards show?"

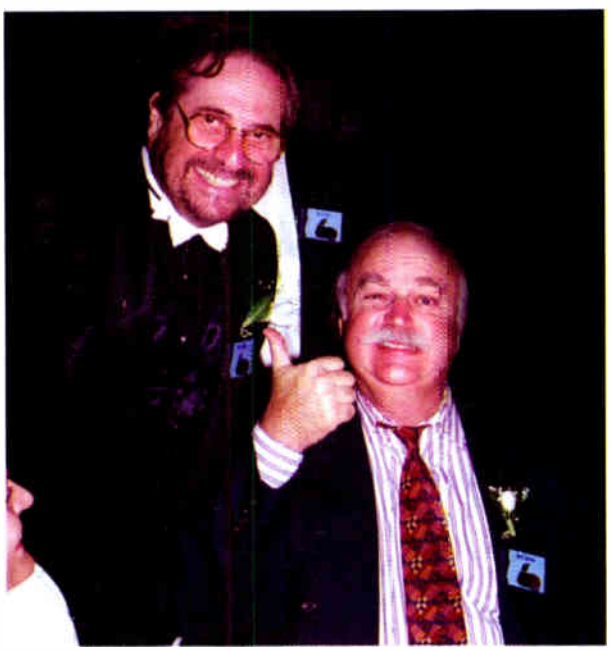
The founders of the Foundation, from left: Mix *co-founders David Schwartz and Penny Riker, and then-*Mix *associate publisher Hillel Resner*

World Radio History

From left, Jeff "Skunk" Baxter uses an early model cell phone to let friends know he is hanging with the legend himself, Les Paul. Mix founder David Schwartz and Mix publisher Hillel Resner worked their way into yet another photo op.

From there, Schwartz, Jacob and the *Mix* staff (I was associate publisher at the time) were off to the races. Names were bandied about (one early entry was the "Mitzvah Awards"), and plans were laid for an inaugural ceremony during the AES Convention in October of the following year. Nowadays, there would be focus groups, a business plan and a preliminary budget, most likely leading to the decision to kill it. But back then, things were different. We were entrepreneurs and this was a great idea.

The First Annual Technical Excellence & Creativity Awards was held in New York City on October 14, 1985, during the AES Convention. Looking back, it took a certain amount of *chutzpah* to throw an awards show during AES, which at that time still had an annual banquet that included the presentation of awards. However, the AES did not honor products, and because *Mix* devoted most of its content to audio tools and techniques, there didn't seem to be any conflict.



Phil Ramone and Bruce Swedien

You Had to Be There

The first TEC Awards was held in a remarkable venue—the Puck Building, a colonnaded 19th-century structure in New York's SoHo district. Riker served as executive producer, and longtime pro audio advertising maven Ron Neilson was producer/director. As befitting a "technical" event, tons of audio and video equipment was loaded in for the ceremony, which featured a buffet dinner, followed by the awards and a post-show performance by Herbie Hancock and the Rockit Band. Unfortunately, the proceedings were late getting started, as it took an inordinately long time to feed the 500 or so guests—so long, in fact, that a number of attendees got tired of standing in line and sent out for Chinese food and pizza!

When the ceremony began, however, it became obvious to those in attendance that something special was taking place. Though the production values were minimal at best, the presenters often nervous and the pacing—like the dinner—a bit slow, the TEC Awards was a definite "first." The show's host, actor Howard Hesseman ("Johnny Fever" of *WKRP in Cincinnati*), introduced a stream of industry luminaries—from Chris Stone, then-owner of the Record Plant, to Betty Bennett, later the co-founder of Apogee Electronics—who presented awards in 17 categories of Technical, Creative and Institutional Achievement.

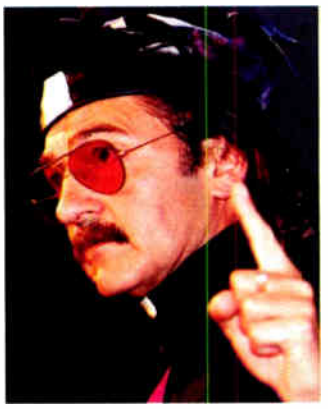
Alone and in pairs, the winners trooped to the stage to accept the TEC statue, fashioned in the image of a sine wave. There was polite applause, raucous catcalls and quite a bit of backslappping. Ours is a small industry, and the TEC Awards provided the ideal venue for this coming together of a community of tremendously creative people. To an outsider, it might have seemed kind of odd to see someone become emotional about receiving an award for inventing a black box with flashing LEDs and an unpronounceable name—but to this audience, TEC was a long-overdue forum for recognizing the people and innovations behind the ever-improving *sound* of records, concerts, motion pictures, etc. The universal feeling was: "It's about time!"

Changing Times

From the start, the TEC Awards was structured to recognize everyone involved in the audio production chain. Outstanding Creative Achievement singled out the *individuals*

Phil Proctor, 1989

Al Kooper, 1997



Father Guido Sarducci, 1998

Godfrey, 2000

World Radio History

The Birth of the TEC Awards

in the creative process: recording engineer, record producer, sound reinforcement engineer, mastering engineer, *et al*. Outstanding Institutional Achievement recognized the contributions of the *facilities* where the production process takes place: recording studios, mastering houses, etc. Outstanding Technical Achievement honored the *products* employed by professionals in the creative process: microphones, loudspeakers, recording devices, signal processing gear and so on.

Laurie Anderson

Dividing the awards into these major categories was an arrangement that lent itself to modification, which turned out to be a good thing. As audio technology and the production process itself underwent changes, they were mirrored by the various subcategories of the TEC Awards. Recording Technology morphed into Recording Devices and Storage Technology, and later spun off Workstation Technology as a discrete category. Microphone Technology split into Studio and Sound Reinforcement categories, and, as pesky cables disappeared, spun off Wireless Technology. With the advent of the project studio, Console Technology soon divided into Small Format and Large Format. And Signal Processing, reflecting the plug-in revolution, divided into two categories—Hardware and Software. Over the years, there have been numerous other changes as well. What a long, strange trip it's been.

Richard Belzer, 1989

Harry Shearer, 2002

The Creative and Institutional categories have undergone changes of their own. While these categories have consistently acknowledged the achievements of the industry's most accomplished professionals and facilities (people and companies such as Bob Clearmountain, Ed Cherney, Bob Ludwig, Record Plant and Clair Brothers have received multiple awards), their structure did not lend itself well to spotlighting the work of younger faces and newer companies. To correct this, in 2001, the TEC Awards abolished the category of Institutional Achievement and reinvented the Creative Achievement category to honor outstanding audio *projects* and all the technical people and companies who work on them. This has resulted in recognition for engineers, mixers, studios and others who might not have been noticed previously. For example, in 2003, the highly talented engineer Trina Shoemaker won awards for both the album and title track from Sheryl Crow's *C'mon, C'mon*, and the audio production crew of *Austin City Limits* won the TEC Award for Television Sound Production.

As in so many other things, the only constant in professional audio seems to be change, and the TEC Awards—or, more specifically, the voters who choose the winners—have seen to it that the brightest people and most innovative products get the recognition they deserve. Moreover, the TEC Awards has helped to raise the overall profile of the industry—a tiny "niche" that provides entertainment and inspiration for millions. It's interesting what can happen when you start handing out little gold statues. ■

Hillel Resner is the president of the Mix Foundation and executive producer of the TEC awards.

And the TEC Award Goes To...

If you've ever been in the reception area of a big pro audio manufacturer and seen a display case full of awards, you've probably noticed a TEC Award or two (or three or eight or 11). The fact is, there are a few select companies that probably don't have a display case large enough to hold all their TEC Awards. Excellence in technological innovation isn't an accident—it's something to which many companies in the pro audio industry have dedicated themselves. And achievement tends to breed more achievement, as in the case of the companies on this list who have won five or more TEC Awards.

COMPANY	AWARDS	NOMINATIONS
Yamaha	15	40
Digidesign	13	28
JBL	11	26
Apogee	9	13
Lexicon	8	26
Alesis	8	23
Mackie	8	22
TC Electronic	8	19
Solid State Logic	7	22
TASCAM	7	20
Kurzweil	6	11
Genelec	6	8
Sony	5	32
AKG	5	20
Crown	5	20
MOTU	5	16
AMS Neve	5	15

NOTE: Awards are through 2003; nominations through 2004

World Radio History

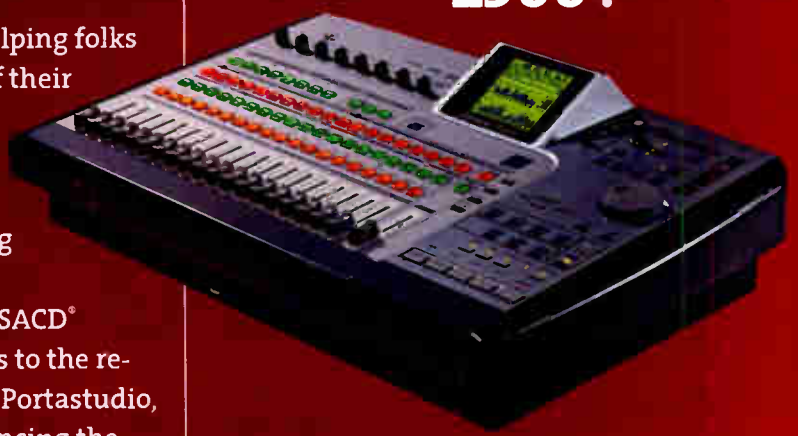
OLD! A-3340S

4 tracks, 15 i.p.s, Simul-Sync: $3689*

"It's actually an evolution, starting in 1969, with the few custom-made sync 4-tracks modified from TEAC's quadraphonic 4010 decks into the overdub-capable Simul-Sync TCA 40. But the REAL revolution was in 1972, with the debut of the mass market A-3340S ¼" 4-track reel-to-reel machines. That changed EVERYTHING!"

— GEORGE PETERSEN, MIX

24 tracks, 24-bit digital: under $1500**.



Still has Simul-Sync.

2488 Portastudio™

- Simultaneously record up to 8 channels in studio quality 24-bit/44.1kHz digital
- 24 total recording tracks plus 250 virtual tracks for comping
- Built-in CD-RW drive!
- Hi-speed USB 2.0 port
- 64-voice MIDI sound module
- Twenty 45mm faders
- Four XLR/¼" mic/line inputs with phantom power
- Four ¼" mic/line inputs (one of which is also a Hi-Z guitar input)
- 3 aux sends (one internal, two external)
- Built-in guitar multi-EFX processor
- Internal stereo EFX processor
- Up to 8 assignable dynamics processors
- 36-input-to-stereo mixdown
- S/PDIF digital In/Out
- Balanced ¼" Monitor Out
- RCA stereo outputs
- Built-in power supply

We've been helping folks get songs out of their heads and onto magnetic recording media for a long time.

From 192kHz SACD® DTRS™ recorders to the remarkable 2488 Portastudio, we're still advancing the state of the art.

Visit your TASCAM dealer, e-mail us at *tascamlit@teac.com* or log onto our web site for complete information on all our recording products.

Sorry, we're fresh out of A-3340S brochures.

TASCAM®

*2004 equivalent of A-3340S's 1972 $849** MSRP. A tip of the propellor-head beanie to The Inflation Calculator, available online at www.westegg.com/inflation.

**MSRP. Street price may vary. Your life may vary. Heck we may all perish in a collision with an asteroid while you're on your way to your nearest TASCAM dealer.

©2004 TASCAM All Rights Reserved. All specifications are subject to change without notice.

DJ AND PRODUCER

www.tascam.com

CONTRACTOR

PROFESSIONAL AUDIO

World Radio History

Who Picks the Winners, Anyway?

As with any awards show, the most scrutinized and controversial aspect of the TEC Awards has always been the process of nominating and selecting the winners. Not surprisingly, many of the people displeased with the results have no idea how the process works. So here, for the edification of anyone who might be curious, is the "official" explanation:

At the beginning of each year, a postcard and/or e-mail is sent to a couple of thousand audio professionals, not limited to subscribers of *Mix*, inviting them to serve on the TEC Awards Nominating Panel. The Nominating Panel usually consists of about 200 people, ranging from studio owners, engineers and live sound mixers to studio designers, marketing professionals and educators. A review of some of the folks who served on the very first panel, in 1985, provides a good insight into the kind of person who helps pick the nominees. Panelists included: George Augspurger, renowned studio designer; Hal Blaine, "the world's most recorded drummer"; Jeep Harned, now-deceased developer of the MCI console; Bernie Leadon, guitarist with the original Eagles; Ken Pohlmann, respected audio journalist and longtime professor at the University of Miami; and Joe Tarsia, legendary founder of Sigma Sound in Philadelphia. Last year's nominating committee had members of comparable stature and experience.

After the committee makes its nominations (due by April 30), they are tabulated by the Mix Foundation staff and the results are reviewed by the editorial board of *Mix*. The board, headed by editorial director George Petersen, ensures that nominees fall within the eligibility year, have not been nominated previously, and (in the categories under Technical Achievement) that products are in commercial use and not simply being beta-tested.

The nominees with the highest number of votes in each category appear on the Voting Ballot, which is affixed to the cover of the September issue of *Mix*. Only BPA-qualified subscribers (people whose job titles and business activities have been verified by the business magazine industry's auditing agency) receive the ballot. It is not mailed to overseas subscribers and does not appear on newsstand copies.

Mix readers mail their ballots directly to a certified public accounting firm, which tabulates the votes and forwards the results to the TEC Awards executive director. The winners' names are kept in confidence until the night of the awards ceremony.

The Mix Foundation For Excellence in Audio

The Mix Foundation for Excellence in Audio is a 501(c)(3) public charity established in 1990 by the publishers of *Mix* to promote excellence in the audio, video, music and other communications media arts, and to address health and occupational issues of concern to those professions. Through the Technical Excellence & Creativity Awards and other programs, such as the annual Mix L.A. Open golf tournament, the Foundation supports organizations that work to educate professionals and the public about the growing problem of noise-induced hearing loss in the music environment. The Foundation also endows numerous scholarship programs for students of the communications media arts.

Since 1990, the Mix Foundation has contributed more than half-a-million dollars to hearing conservation and audio scholarship programs. The Foundation also offers an annual TEC Awards Scholarship to deserving students of the audio arts and sciences. For more information, or to contribute to the work of the Foundation, visit www.mixfoundation.org, or write to: Mix Foundation, 1547 Palos Verdes Mall #294, Walnut Creek, CA 94597.

Hillel Resner, Karen Dunn, Penny Riker and David Schwartz

World Radio History

AKG ACOUSTICS

Legendary Products. Legendary Status.

C 12

C 414B-TLII

C 12 VR

C 900

K 271 S

C 414B-ULS

In 1987, the TEC Awards added a new category called "Transducer Technology" and the first winner was the AKG C 414B-ULS. Since then, 19 AKG products have been nominated and 8 of them have won TEC Awards thus far. This year, our C 12 microphone, introduced 35 years ago is being inducted into the TEC Hall of Fame as one of the 25 most influential products in audio history.

It makes us especially proud when an organization dedicated to recognizing the achievements of audio professionals and the tools they use singles out our products from the many great ones available.

AKG would like to thank the Mix Foundation for Excellence in Audio for 20 great years and we look forward to many more.

AKG

World Radio History

TEC Awards Lifetime Achievement

TEC Awards Hall of Fame

The TEC Awards Hall of Fame was established in 1988 to recognize those individuals, living or deceased, whose careers have exemplified the spirit of technical and creative excellence in recording and sound.

1988 • Bob Liftin, Les Paul

1989 • Wally Heider, George Martin, Rupert Neve

1990 • Deane Jensen, Quincy Jones, George Massenburg

1991 • Ray Dolby, Bill Putnam, Bruce Swedien

1992 • Bob Moog, Bill Porter, Phil Ramone

1993 • Rudy Van Gelder

1994 • Frank Zappa

1995 • Phil Spector

1996 • Willi Studer

1997 • Al Schmitt

1998 • Colin Sanders

1999 • Tom Dowd

2000 • Sam Phillips

2001 • Roy Halee

2002 • Geoff Emerick

2003 • Eddie Kramer

2004 • George Lucas, Elliot Scheiner

The Les Paul Award

Named for one of the music industry's most revered personalities (and the inventor of both the solid-body electric guitar and multitrack recording), the Les Paul Award was created in 1991 to honor individuals or institutions that have set the highest standards of excellence in the creative application of audio technology.

1991 • Bob Ludwig, Clair Brothers, Power Station

1992 • Bob Clearmountain

1993 • Peter Gabriel

1994 • Herbie Hancock

1995 • Alan Parsons

1996 • Brian Wilson

1997 • Stevie Wonder

1998 • Neil Young

1999 • Sting

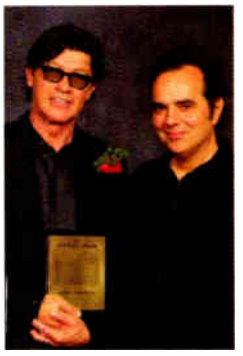
2000 • Paul McCartney

2001 • Steely Dan

2002 • Robbie Robertson

2003 • Bruce Springsteen

2004 • Jimmy Jam, Terry Lewis



Robbie Robertson and Daniel Lanois

Ray Dolby

Herbie Hancock

Stevie Wonder

World Radio History

what happened?

find out at obedia.com

World Radio History

TEC Awards Almanac

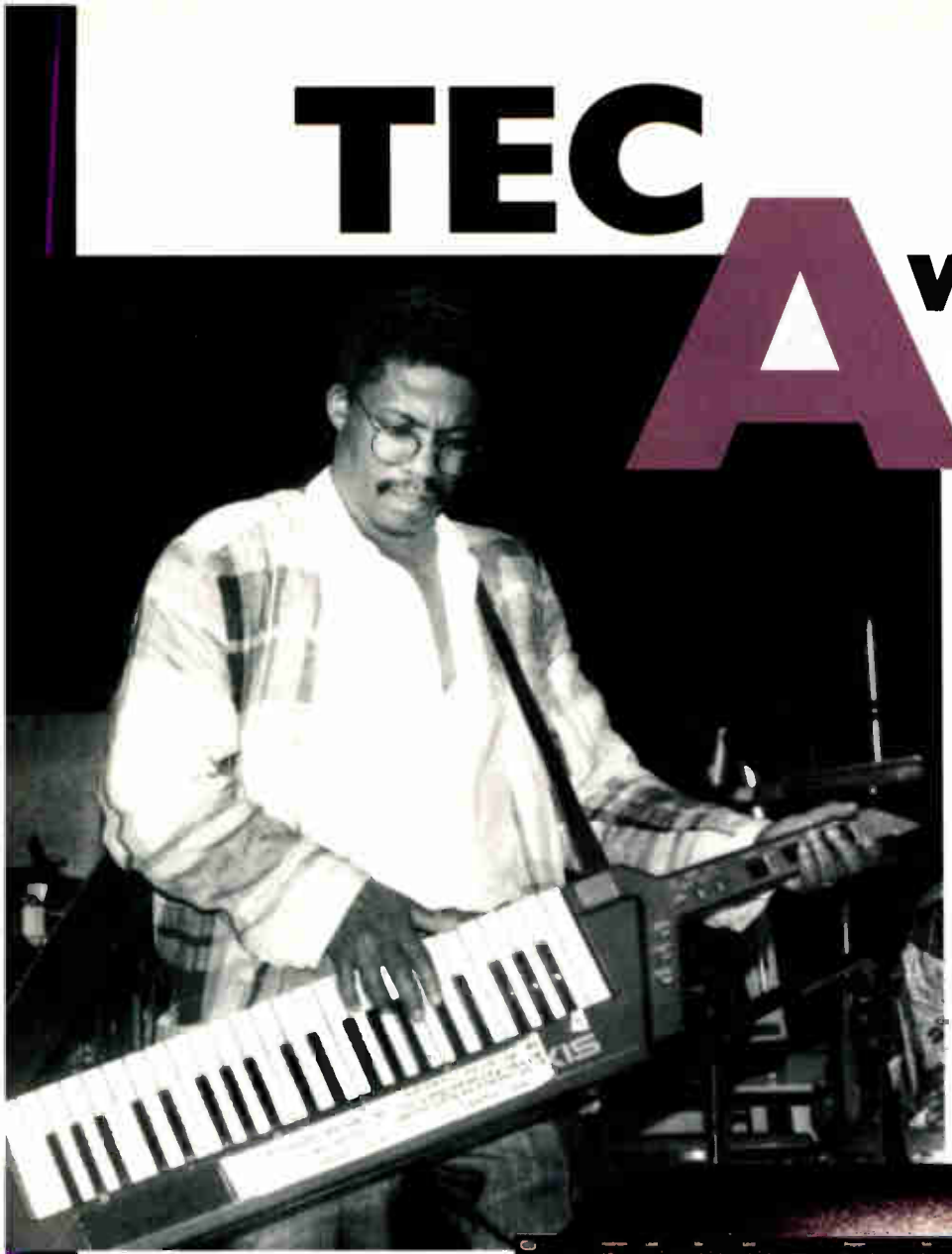


PHOTO: GEORGE PETERSEN

OCTOBER 14, 1985

The Puck Building, New York City
HOST: Howard Hesseman
HIGHLIGHTS: Bob Clearmountain wins the first TEC Award for outstanding recording engineer. Herbie Hancock and the Rockit Band cap the show with a rousing performance. Lexicon's low-cost PCM60 digital reverb takes the TEC Award in Recording Technology, beating out high-end digital multitracks from Mitsubishi and Sony.

NOVEMBER 13, 1986

Hyatt Regency, Los Angeles
HOST: Ray Hanna
HIGHLIGHTS: Comedian/actor Cheech Marin presents the awards for Creative Achievement. Renowned mastering engineer Bob Ludwig (at right, with Doors keyboardist Ray Manzarek, in 1991) receives one of his 10 TEC Awards. Lucasfilm's The Droid Works division wins a TEC Award for SoundDroid—a touchscreen, moving fader DAW that debuted 10 years before Pro Tools.

World Radio History

OCTOBER 16, 1987

Manhattan Center Ballroom,
New York City
HOST: Ray Hanna
HIGHLIGHT: To a standing ovation, the great guitarist and inventor Les Paul makes the first of his many appearances at the TEC Awards. David Hewitt (above) accepts a TEC Award for remote recording engineer; many more were to follow. New England Digital's Synclavier Direct to Disk (a $200,000 8-track digital recorder) wins a TEC Award—digital would be a *lot* more affordable in the years to come...

OCTOBER, 19, 1989

Manhattan Center Ballroom,
New York City
HOST: Richard Belzer
HIGHLIGHT: Television producer Norman Lear (center in group photo), whose company bought *Mix* that year, surprises the audience with an *a cappella* rendition of "There's a Song in My Heart." Rupert Neve is inducted into the Hall of Fame (above). Sony's TEC-winning PCM-3348 puts 48 tracks of audio on ½-inch digital audio tape; it's $240,000, and sales take off like a rocket. Beatles producer Sir George Martin was inducted into the Hall of Fame.

NOVEMBER 3, 1988

The Biltmore, Los Angeles
HOST: Phil Proctor
HIGHLIGHT: The TEC Awards Hall of Fame is inaugurated with Les Paul and Bob Liftin (below) as its first inductees. With a TEC win, Tannoy's PBM 6.5 monitors usher in the age of low-cost studio monitors.

SEPTEMBER 23, 1990

The Biltmore, Los Angeles
HOST: Phil Proctor & Mr. Bonzai
HIGHLIGHTS: Herbie Hancock accepts the Hall of Fame award on behalf of Quincy Jones from engineer Bruce Swedien (below). Also inducted is producer/engineer George Massenburg, who receives his award from producer Peter Asher (below right). Meyer Sound Labs takes an award for its HD-1 studio monitors, which opens the market for high-powered, precision near-fields.

World Radio History

TEC Awards Almanac

OCTOBER 5, 1991

Grand Hyatt, New York City

HOST: "Weird Al" Yankovic (flanked by bassist Will Lee, Les Paul and Art Garfunkel)

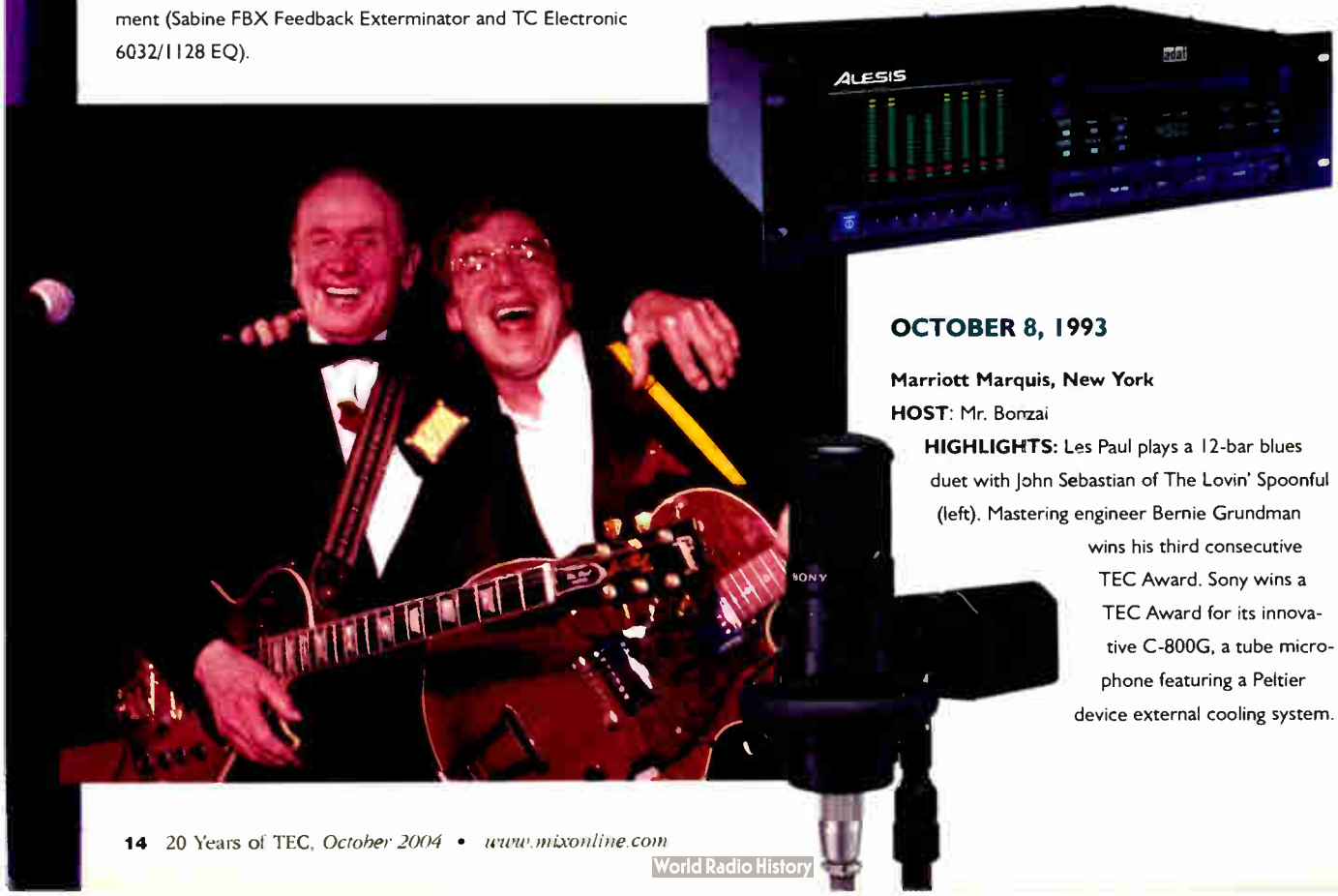
HIGHLIGHT: The Les Paul Award is inaugurated and Les himself presents the award to Clair Brothers, Bob Ludwig and Power Station. For the first (and only time) in TEC history, there are ties in three categories: Acoustics/Studio Design Company (Russ Berger Design Group and Walters-Storyk Design); Musical Instruments (Alesis SR-16 drum machine and Roland S-770 sampler); and Sound Reinforcement (Sabine FBX Feedback Exterminator and TC Electronic 6032/1128 EQ).

OCTOBER 2, 1992

Westin St. Francis, San Francisco

HOST: Bud E. Luv

HIGHLIGHT: Having thoroughly shaken the industry, the Alesis ADAT (below) wins two TEC Awards. Later, while inducting synth pioneer Robert Moog into the Hall of Fame, Devo's Mark Mothersbaugh (above) drops to his knees and bows to Moog in a gesture of "I am not worthy." Fellow HOF inductee Bill Porter regales the TEC audience with tales of engineering Elvis.



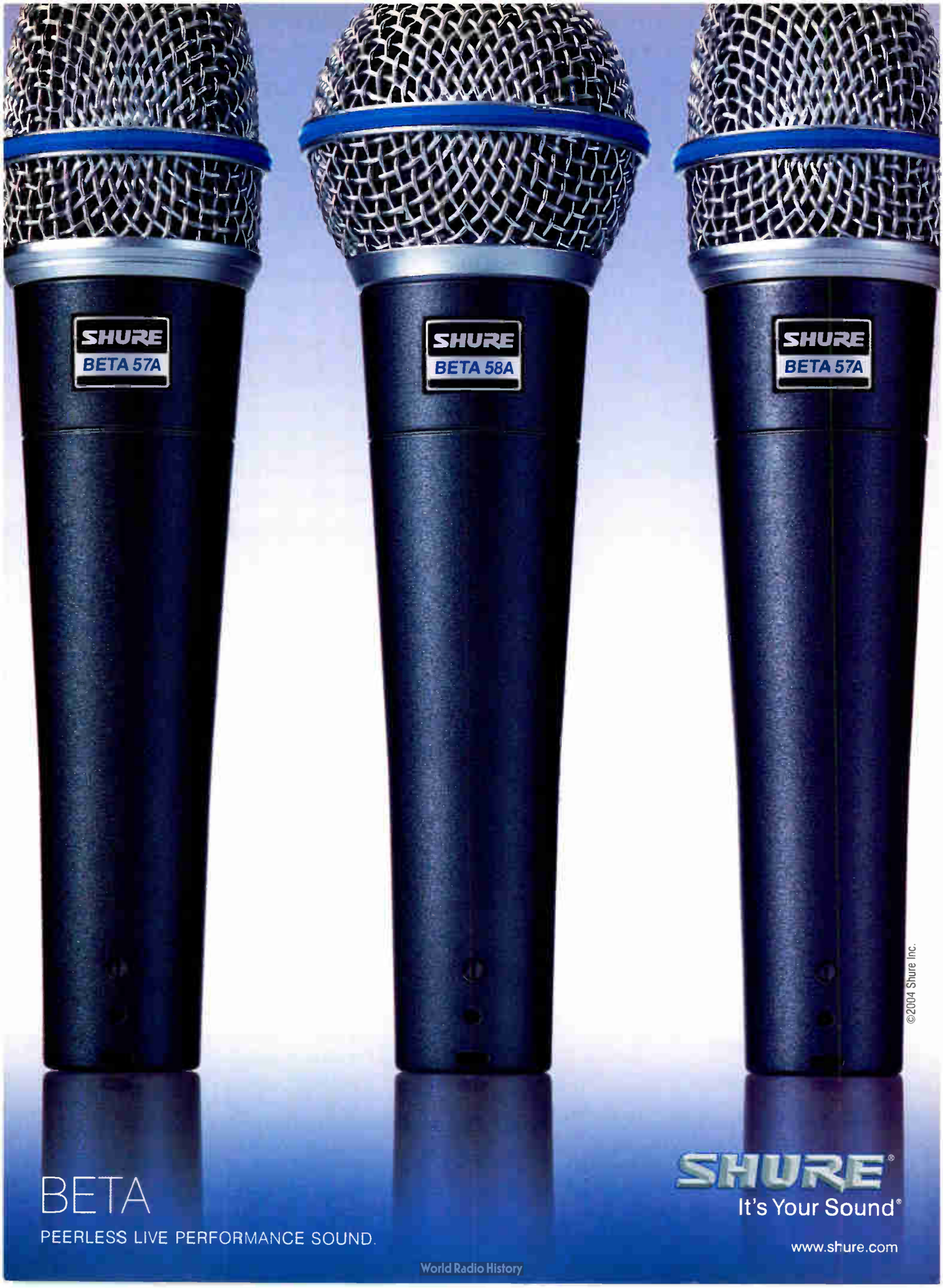
OCTOBER 8, 1993

Marriott Marquis, New York

HOST: Mr. Bonzai

HIGHLIGHTS: Les Paul plays a 12-bar blues duet with John Sebastian of The Lovin' Spoonful (left). Mastering engineer Bernie Grundman wins his third consecutive TEC Award. Sony wins a TEC Award for its innovative C-800G, a tube microphone featuring a Peltier device external cooling system.

World Radio History



BETA

PEERLESS LIVE PERFORMANCE SOUND.

SHURE®

It's Your Sound®

www.shure.com

©2004 Shure Inc.

World Radio History

TEC Awards Almanac

NOVEMBER 11, 1994

Westin St. Francis, San Francisco
HOST: Father Guido Sarducci
HIGHLIGHTS: Guitar icon Carlos Santana (right) presents the Les Paul Award to jazz great Herbie Hancock. A pickup band composed of Booker T Jones, Boz Scaggs, Don Was and Ray Benson improvises on "Green Onions" and "Sittin' on the Dock of the Bay." Mackie's TEC-winning 8-Bus analog console shatters the console price barrier and becomes a best-seller.

NOVEMBER 9, 1996

The Biltmore, Los Angeles
HOST: Father Guido Sarducci
HIGHLIGHTS: Musician/producer Don Was wins the TEC Award for Outstanding Producer, and then presents the Les Paul Award to Brian Wilson of the Beach Boys (above). Yamaha continues its long TEC Award-winning tradition with its groundbreaking 02R digital console (right).

OCTOBER 6 1995

Marriott Marquis, New York City
HOST: Al Kooper
HIGHLIGHTS: TEC-winner Opcode Studio Vision Pro brings digital audio manipulation/editing into the realm of the computer sequencer. Bandleader Paul Shaffer of *Saturday Night Live* inducts his friend Phil Spector (above) into the TEC Awards Hall of Fame. Spector then mesmerizes the audience with a nearly 20-minute speech.

SEPTEMBER 27, 1997

Marriott Marquis, New York
HOST: Greg Fitzsimmons
HIGHLIGHT: An emotional Stevie Wonder accepts the Les Paul Award. He wears a tuxedo created especially for the occasion, with different colored patch cords hanging from it like fringe (above). Also in 1997, Neumann wins a TEC Award for its M149—the company's first new tube mic in decades.

World Radio History

Be a part of audio history...

20 YEARS TEC

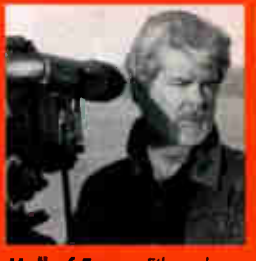
Technical Excellence & Creativity Awards

Saturday, October 30
San Francisco Marriott
San Francisco, California

A Benefit for Hearing Conservation and Audio Education

The Mix Foundation for Excellence in Audio invites you to join us on the third night of the AES Convention in celebrating 20 years of achievement in professional audio.

Les Paul Award: *Producers Jimmy Jam & Terry Lewis*



Hall of Fame: *Filmmaker George Lucas*

Hall of Fame: *Engineer/ Producer Elliot Scheiner*

HOSTED BY

HARRY SHEARER

(*Spinal Tap*, "The Simpsons," *A Mighty Wind*)

TICKET INFORMATION
Karen Dunn – 925-939-6149
karen@tecawards.org

SPONSORSHIP INFORMATION
Eric Geer – 414-967-0104
Visit www.mixfoundation.org

SAN FRANCISCO

World Radio History

TEC Awards Almanac

SEPTEMBER 27, 1998

Fairmont Hotel, San Francisco
HOST: Father Guido Sarducci
HIGHLIGHT: Neil Young (above), after accepting the Les Paul Award from Alan Parsons, delivers an electrifying speech attacking the shortcomings of digital audio. As if in response, EveAnna Manley wins her company's first TEC Award for the (very) analog Manley VoxBox.

SEPTEMBER 23, 2000

The Biltmore, Los Angeles
HOST: Godfrey
HIGHLIGHT: Sun Records founder Sam Phillips, who first recorded Elvis, is inducted into the Hall of Fame by his former musical director Ike Turner (below). Phillips tells the assembled producers and engineers, "Every one of you is an extension of Thomas Edison." The TC Electronic 6000 wins for Signal Processing Technology/Hardware (below left).

SEPTEMBER 27, 1999

Marriott Marquis, New York
HOST: Father Guido Sarducci
HIGHLIGHTS: Legendary engineer Tom Dowd (right) is inducted into the Hall of Fame by Atlantic Records founder Ahmet Ertegun. Sting (above), recipient of the Les Paul Award, is presented with a custom-made Les Paul guitar and tells the audience: "I always wanted a Les Paul, but I never dreamed I would get one from the man himself."

World Radio History

Always listening

Audio-Technica—Audio pioneer in electro-acoustic design

Established in 1962, Audio-Technica is a leading innovator in electro-acoustic design and manufacturing. Initially known for state-of-the-art phonograph cartridges, A-T now creates high-performance microphones, headphones, wireless systems, mixers and electronic products for home and professional use.

Winner of numerous industry awards, Audio-Technica products set quality, durability and price/performance standards for live sound tours, broadcast and recording studios, corporate and government facilities, house-of-worship venues, and more. A-T microphones are chosen for critical installations in the U.S. House of Representatives and Senate. Audio-Technica microphones and wireless systems dominate the GRAMMY® Awards and the Rock & Roll Hall of Fame induction ceremonies.

Audio-Technica products have provided seamless audio coverage and technical support in presidential debates since 1988. A-T mics also deliver versatile solutions at high-profile sports broadcasts, including the Super Bowl and World Cup Soccer, as well as the Summer Games in Athens (2004), Sydney (2000), and Atlanta (1996), and the Winter Games in Salt Lake City (2002).

With operating companies in the U.S., Japan, Europe, Singapore and Hong Kong, Audio-Technica today is a global leader in its field, committed to providing superior performance and exceptional value for customers around the world.

Audio-Technica is proud to participate in the TEC Awards as a Gold Sponsor, and to support the Mix Foundation's work promoting excellence in audio, video, music and other communications media arts. We are also honored that four innovative A-T products have been recognized with 2004 TEC Award nominations: AT3060 cardioid phantom-powered tube microphone; MB 3k unidirectional dynamic vocal microphone; ATH-M20 closed-back dynamic stereo monitor headphones; and the AEW-4250 UHF wireless handheld dynamic microphone system.

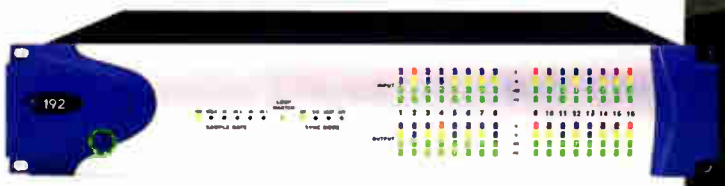
audio-technica®

always listening™

www.audio-technica.com

World Radio History

TEC Awards Almanac



OCTOBER 7, 2002

Wilshire Grand Hotel, Los Angeles

HOST: Harry Shearer

HIGHLIGHTS: Famed producer Daniel Lanois presents Robbie Robertson of The Band with the Les Paul Award (right). Engineer/producers George Massenburg and Al Schmitt induct Beatles engineer Geoff Emerick into the Hall of Fame. Digidesign wins a TEC Award for Pro Tools|HD (above), a product that opened the era of 24-bit/192kHz production.

OCTOBER 11, 2003

Marriott Marquis, New York City

HOST: Brad Zimmerman

HIGHLIGHTS: Janie Hendrix, sister of Jimi, inducts engineer Eddie Kramer into the Hall of Fame (below). Engineer Trina Shoemaker (below, right) wins two TEC Awards for her work with Sheryl Crow on *C'mon, C'mon*. Vintage reissue products take center stage, with TEC Awards going to the Universal Audio 6176 mic preamp and the Telefunken USA Ela-M 251 studio mic.

DECEMBER 1, 2001

Marriott Marquis, New York City

HOST: Father Guido Sarducci

HIGHLIGHT: Just 10 weeks after 9/11, the TEC Awards return to New York City. The Creative Awards, has reconfigured to recognize outstanding projects. B.B. King and Eric Clapton's album, *Riding With the King*, takes home the first award for Record Production /Album. Steely Dan's Donald Fagen and Walter Becker receive Les Paul Awards (below).

World Radio History

ACCELERATE YOUR SOFTWARE WITH MACKIE HARDWARE.

MACKIE CONTROL
UNIVERSAL

Most professionals know that control surfaces are a great thing — letting you record and mix music much faster than with a mouse and keyboard alone. But much like software, all hardware is not created equal. And that's why you owe it to your music to check out Mackie Control Universal, the industry standard in professional, full-featured software control surfaces.

Unlike other controllers, Mackie Control Universal is a robust, fully expandable system featuring top-notch components like 100mm Penny + Giles motorized touchfaders, multi-function V-Pots for fast tweaking of panning and effects, a full meter display with track names and parameters, plus a bright LED timecode display. It also offers the industry's widest software compatibility, letting you control everything from Pro Tools, Logic and Nuendo to Cubase SX/SL, Performer, Sonar, Audition and more.

And when it's time to grow, you can easily expand Mackie Control Universal for up to 32 faders or more of realtime control*. So if you're ready to accelerate your software with serious hardware, get your hands on a Mackie Control Universal. Visit mackie.com to learn more.

NOW CONTROLS DIGIDESIGN PRO TOOLS | APPLE EMAGIC LOGIC PRO STEINBERG CUBASE SX/SL, NUENDO | ADOBE AUDITION CAKEWALK SONAR | MOTU DIGITAL PERFORMER and more...

* Maximum number of faders depends on software. Details at mackie.com.

800.898.3211 (Toll free within U.S.)
425.487.4333 (Outside U.S.)
info@mackie.com

MACKIE.
www.mackie.com

World Radio History

TECnology Hall of Fame

25 Audio Innovations That Changed The (Pro Audio) World

By George Petersen

Compared to medicine or agriculture, the history of professional audio has been a comparatively short 125 years or so—barely a ripple in geologic time. But a whole lot has happened in that century and a quarter. True, other innovations also emerged in that era—from automobiles to aviation, telephones to television, exploring outer space to cyberspace—but for we true devotees, *audio* is what counts.

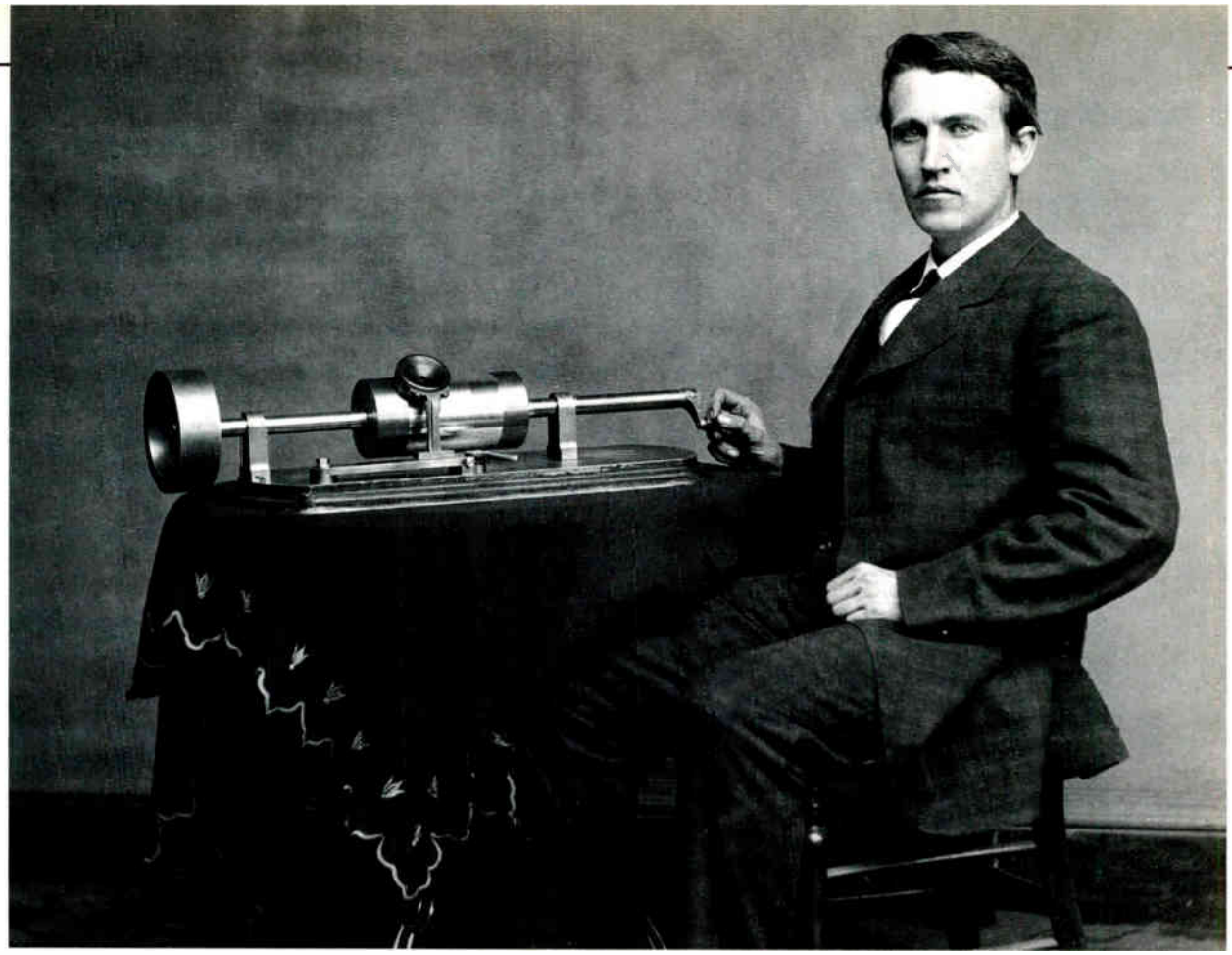
To recognize technical excellence and creativity in professional audio, the TEC Awards was established two decades ago. During the years, the TEC Hall of Fame and Les Paul Awards were added to honor individuals who made important contributions to our industry. The HOF members include Ray Dolby, Tom Dowd, Geoff Emerick, Roy Halee, Wally Heider, Deane Jensen, Quincy Jones, Eddie Kramer, Bob Liftin, George Lucas, George Martin, George Massenburg, Bob Moog, Rupert Neve, Les Paul, Sam Phillips, Bill Porter, Bill Putnam, Phil Ramone, Colin Sanders, Elliot Scheiner, Al Schmitt, Phil Spector, Willi Studer, Bruce Swedien, Rudy Van Gelder and Frank Zappa,

To expand the scope of the 20th annual TEC Awards, the Mix Foundation created a TECnology Hall of Fame to spotlight the long and rich history of the pro audio industry. Selecting just 25 inductees from a 125-year heritage turned out to be a difficult task, indeed. An elite committee of more than 50 industry leaders, engineers, producers, designers, educators, journalists and historians volunteered their time to help in this endeavor, and each was asked to pick 25 innovations (10 pre-1950 and 15 from 1950-1994), with the only "rule" being that any selections must be at least 10 years old.

Once the results were in, I was given the honor of tabulating the results and writing narratives that put each into a historical context. It wasn't easy: Many manufacturers are long since out of business. At some companies, no one remains who has any knowledge of the product. Worst of all, the history of pro audio—our very lineage—is woefully neglected and sources are scarce, if not impossible to find.

As you read these, bear in mind that this is the *first* year of the TECnology Hall of Fame, and we plan to add more honorees in the future. So if your personal fave—such as the 1996 J-Con ¼-inch-to-3-pin AC plug adapters—wasn't included, there's always next year. Send your comments/suggestions/corrections to mixeditorial@primediabusiness.com or hillel@mixfoundation.org. In the meantime, set your time machine (analog, of course) *waaaay* back and enjoy this magic carpet ride through the annals of audio.

World Radio History



Thomas Edison with his phonograph/talking machine

THOMAS EDISON

Cylinder Recorder (1877)

There is no doubt that Thomas Alva Edison (1847-1931) played a major role in the development of recorded sound. Besides holding patents for more than 1,300 inventions such as incandescent lighting, the stock-ticker, fuses, electrical distribution systems and the kinetoscope "peep show" viewer, Edison's landmark patent (USA #200,251) filed on Christmas Eve, 1877, eventually gave rise to an entire industry—even though the cylinder format that he developed was comparatively short-lived.

According to legend, Edison replayed the words "Mary had a little lamb" on the prototype "phonograph/speaking machine." This first device was crude, using a diaphragm with a sharp point to etch variable-depth indentations in tinfoil wrapped around a hand-cranked cylinder, and the sound was replayed by a lighter diaphragm/needle combo tracking those same grooves. The cylinders were not removable, although Edison proposed removable foil sheets that could be reproduced by creating masters from Plaster of Paris molds.

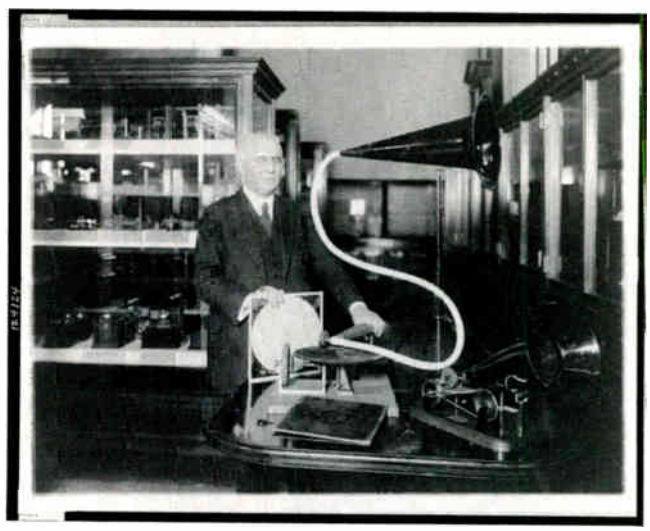
In later patents, including the British BP 1644/1878 in late 1878, Edison proposed dozens of other phonograph concepts, including using discs rather than cylinders, wax materials rather than tinfoil, double-sided discs, electromagnetic recording/playback, electroplating and pressing manufacturing/replication, and even an amplification system based on compressed air. However, Edison was late in filing for Stateside protection on these claims and his U.S. patent was refused, leaving these concepts unprotected.

Meanwhile, Bell unveiled its Graphophone based on removable wax-paper cylinders; Edison countered with his 1888 "Perfected Phonograph," which used a removable solid-wax cylinder. Other than making archival recordings, the main use of the Edison recorders was for transcription. All of this changed around the turn of the century, when molded cylinders became a reality and suddenly the market for music recordings opened up. Eventually, the popularity of cylinders began to fade (although Edison made them until 1929), and Edison reluctantly debuted his first commercial disc phonograph in 1912.

EMILE BERLINER

Gramophone Disc Recorder/Player (1887)

The origin of recorded audio is frequently attributed to Edison, yet Emile Berliner invented the flat-disc Gramophone that was the precursor to the modern record. Born in Hanover, Germany, Berliner (1851-1929) worked after school



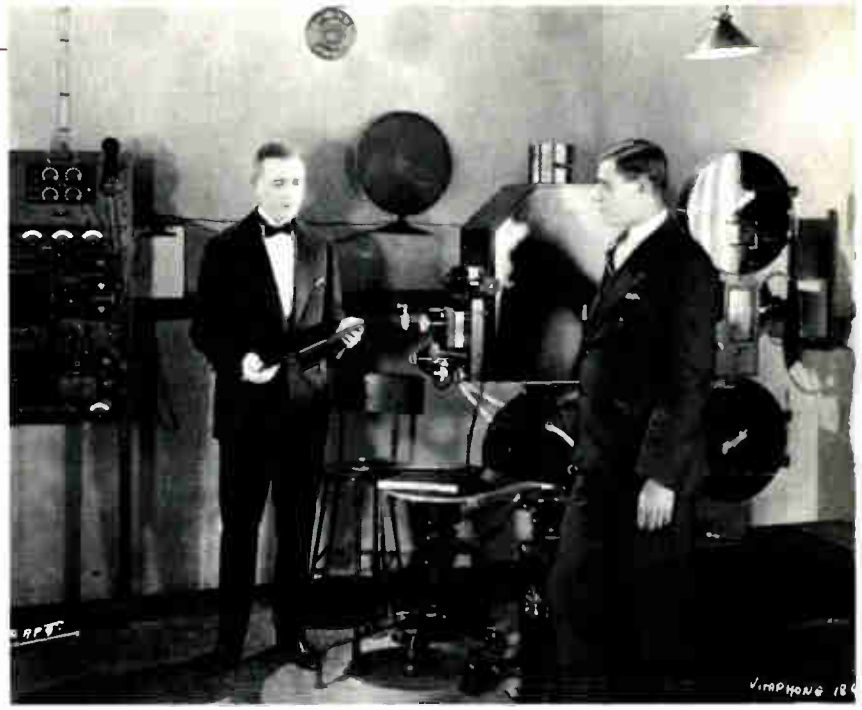
Emile Berliner demos the flat-disc Gramophone.

World Radio History

to help support his 10 brothers and sisters, but at age 19 was offered the opportunity to emigrate to America. He set off for the new land and ended up with a cleaning job in New York at the lab of saccharine developer Constantine Fahlberg. With America's centennial in 1876, he moved to Washington, D.C., where he saw a demonstration of the Alexander Graham Bell telephone. Believing that its weakness was the transducer, he developed the loose-contact transmitter—essentially the carbon microphone—and sold the rights to American Bell Telephone, which hired him on as a research assistant.

After a few years, Berliner left to find his own research company. In 1886, he began examining Edison's cylinder machines, looking for ways to improve their shortcomings, such as the fragile wax grooves and the difficulty of replicating discs. Rather than continue with the cylinder design, Berliner proposed a flat-disc system in 1887 (U.S. patent #372,786) using a wax-coated zinc disc as the recording medium. After the recording machine traced the stylus movements in the soft wax, the disc would be dipped into an acid bath that permanently etched the pattern into the zinc. A separate playback machine was required, and Berliner christened the system the "Gramophone." Electroplating the master zinc disc would result in a stamper that could be used to create copies.

PHOTO PROPERTY OF AT&T ARCHIVES. USED BY PERMISSION



Western Electric engineer E. B. Craft (holding disk) demos the Vitaphone system. Note the synchronized turntable (on pedestal at rear of projector) and Western Electric 1B mic at top of photo.

At first, the Gramophone was only released as a children's toy, using small discs, but with Berliner's formation of United States Gramophone Company, the world began to see the promise of recorded sound for the masses and the record industry was born. Berliner also had numerous other inventions, ranging from gyroscopic motors to "Parquet Carpet" floor coverings to acoustic tiles (1926 patent #1,573,475). Yet perhaps one of his most lasting acts was trademarking Francis Barraud's now-classic "His Master's Voice" painting of a terrier listening to a Gramophone (the company had the artist paint over the original cylinder player in the picture, replacing it with a Berliner disc reproducer), which became the well-known symbol for the Victor Talking Machine Company after it acquired Berliner's business in 1902.

LEE DE FOREST

Triode Vacuum Tube (1906)

If audio would have followed the course of every other technology, then vacuum tubes would have been long forgotten by now. Yet anyone who's ever plugged into a Marshall JTM45, Fender Twin Reverb, Vox AC30, Teletronix LA-2A or any other of hundreds of classic tube devices should give a silent nod to Lee De Forest.

PHOTO HISTORY SAN JOSE. USED BY PERMISSION

Born in Council Bluffs, Iowa, in 1873 and reared in Alabama, De Forest had an aptitude for science from an early age. After receiving a Ph.D. from Yale in 1899, he turned his attention to the seminal field of radio.

Seeking to create a detector for electromagnetic radiation, De Forest began by examining John Fleming's invention of the "electronic valve" (diode), which was fairly insensitive to variances in electromagnetic radiation. By simply adding a third electrode (grid) between the cathode (filament) and the plate (anode) of a diode, the conductance of the tube proved controllable. In this case, a fairly minute signal (voltage) at the grid would result in huge changes in the plate voltage, and the first amplification device was born. De Forest referred to his triode invention as "Audion" and received U.S. patent #879,532 for his discovery in 1907.

De Forest was granted some 300 patents during his life, including Phonofilm, a 1922 method of recording synchronous sound onto film that was unable to garner any interest in the film community. Eventually, the industry adopted an optical sound-on-film system that was similar to De Forest's, but that was years after his De Forest Phonofilm company went bankrupt.

WESTERN ELECTRIC/BELL LABS

Vitaphone Film Sound (1926)

In terms of upheavals, the biggest revolution in 20th-century audio was surely the talking motion picture. In a matter of years, careers were spawned and ruined, and entire industries created and dismantled—all based on the rise of the "talkies." Vitaphone (a 1925 co-venture between Warner Bros. and Western Electric) wasn't the first—or even the last—film sound format to arise out of this new craze, but once the public had a taste of synchronous theater audio, there was no turning back.

Working in the Vitagraph Studio in Brooklyn, N.Y., Western engineers worked with a team from Bell Labs to create Vitaphone, a format using 16-inch discs running at 33⅓ rpm on a projector-driven turntable, for a running time of about 10 minutes, which matched a single 1,000-foot reel of 35mm film. The format was less than ideal: A skip in the record or a film splice meant loss of sync; the system bandwidth was only about 4 kHz; and Vitaphone required an extreme needle force of 85 to 170 grams(!), meaning the life of the shellac disc was limited to a couple dozen plays, at best.

There were earlier film sound systems, ranging from General Electric's Pallophotophone to Lee De Forest's Phonofilm and a variety of earlier systems created at Western Electric. These were doomed mostly by studio/the-

World Radio History

GENELEC®

Genelec

Congratulates

the TEC Awards

for their

recognition of

Technical

Excellence

for twenty

great years.

Kiitos!

8000 MDE™ Series

It's not about being good enough.
It's about exceeding expectations.

www.genelecusa.com

World Radio History

ater owners' reluctance to make the substantial investment in playback equipment. But it was the Vitaphone touch on the 1927 *The Jazz Singer* that created a worldwide demand for film sound. Even with talking parts in a only few sections (mostly song numbers), the success of this Al Jolson mega-hit marked the beginning of the end for the silent screen.

The Vitaphone film+disc system that created the revolution was short-lived, replaced by the sound-on-film systems such as the GE/RCA variable-area soundtracks (the forerunner of today's optical tracks) and Fox's variable density system. But one key to the success of the Vitaphone was the availability of Western Electric sound systems, which not only helped popularize theater sound, but catalyzed the development of modern sound reinforcement systems. Ironically, the film+disc concept was revived 65 years later with the DTS (Digital Theater Systems) release of *Jurassic Park* in 1992, in which 6-channel audio on CD-ROM was locked to timecode on the film. *[Note: The Vitaphone Project was formed to assist in the restoration of Vitaphone-format films—many of which exist today with picture intact but without sound disks. Contact www.vitaphoneproject.com for more info.—Ed.]*

HARRY NYQUIST

Nyquist Theorem (1928)

It's hard to imagine that a man born on February 7, 1889, in the small town of Nilsby, Sweden, would have such an enormous impact on modern digital production. Emigrating to the United States, Harry Nyquist attended the University of Dakota, receiving B.S. and M.S. degrees in Electrical Engineering before completing his studies with a Ph.D. from Yale in 1917. After graduation, he took a job with AT&T, doing research in improving the state of transmitting telegraph picture and voice signals.

PHOTO: PROPERTY OF AT&T ARCHIVES. USED BY PERMISSION

But the (digital) world was forever changed in April 1928, when Nyquist published a lengthy paper in the *AIEE Transaction*. Entitled "Certain Topics in Telegraph Transmission Theory," this unassumingly named article continued his earlier report about improving the speed of telegraph transmissions, but also proposed the basics of sampling continuous analog signals and converting them to a digital form. One of the tenets of digital audio, this Nyquist Theorem specifies that the highest reproducible frequency in a digital system is equal to or less than one-half of the sampling frequency. In real terms, for a digital system to reproduce the entire frequency range of human hearing—20 to 20,000 Hz—then the system has to sample the incoming signal at two times the highest input frequency, or 40 kHz. This doubled figure is known as the sampling rate or sampling frequency.

In 1934, AT&T's Department of Development and Research was folded into Bell Telephone Laboratories where Nyquist continued his work in transmission engineering until retiring in 1954. Altogether, he received 138 patents during his tenure with the Bell System. Nyquist died in 1976—just as the digital era was beginning.

ALAN DOWER BLUMLEIN

Stereo Patent (1931)

Born in London in 1903, Alan Dower Blumlein lived a short life, but during those 38 years, he changed the way that an entire world listens. After receiving his B.S. degree in 1923, he worked at Standard Telephones and Cables, but his main contributions to audio came after he joined the Columbia Graphophone Company in 1929. His early innovations included a moving-coil wax cutter head for gramophone lathes and a moving-coil microphone. Throughout the audio world, he is best known for his 1931 patent, simply entitled "Improvements In and Relating to Sound-Transmissions, Sound-Recording and Sound-Reproducing Systems."

In this patent (British #394,325), Blumlein examines the physiology of the human binaural hearing process and the spatial illusion produced by "two or more loudspeakers"; describes the use of multiple microphones—including the crossed figure-8 (now known as the Blumlein technique) and Mid-Side stereo-miking methods; details a dual 45/45-degree phono cutter head for producing stereo record masters; and proposes a means of transmitting stereo radio. Many of the concepts in this patent did not reach fruition for decades to come, but all have had an enormous impact on the evolution of audio. Around the time of the patent, Columbia Graphophone Company merged with Gramophone Company (HMV), forming Electric and Musical Industries (eventually, this became EMI) and Blumlein stayed on, researching vacuum cathode ray tubes used in the Iconoscope for early TV cameras.

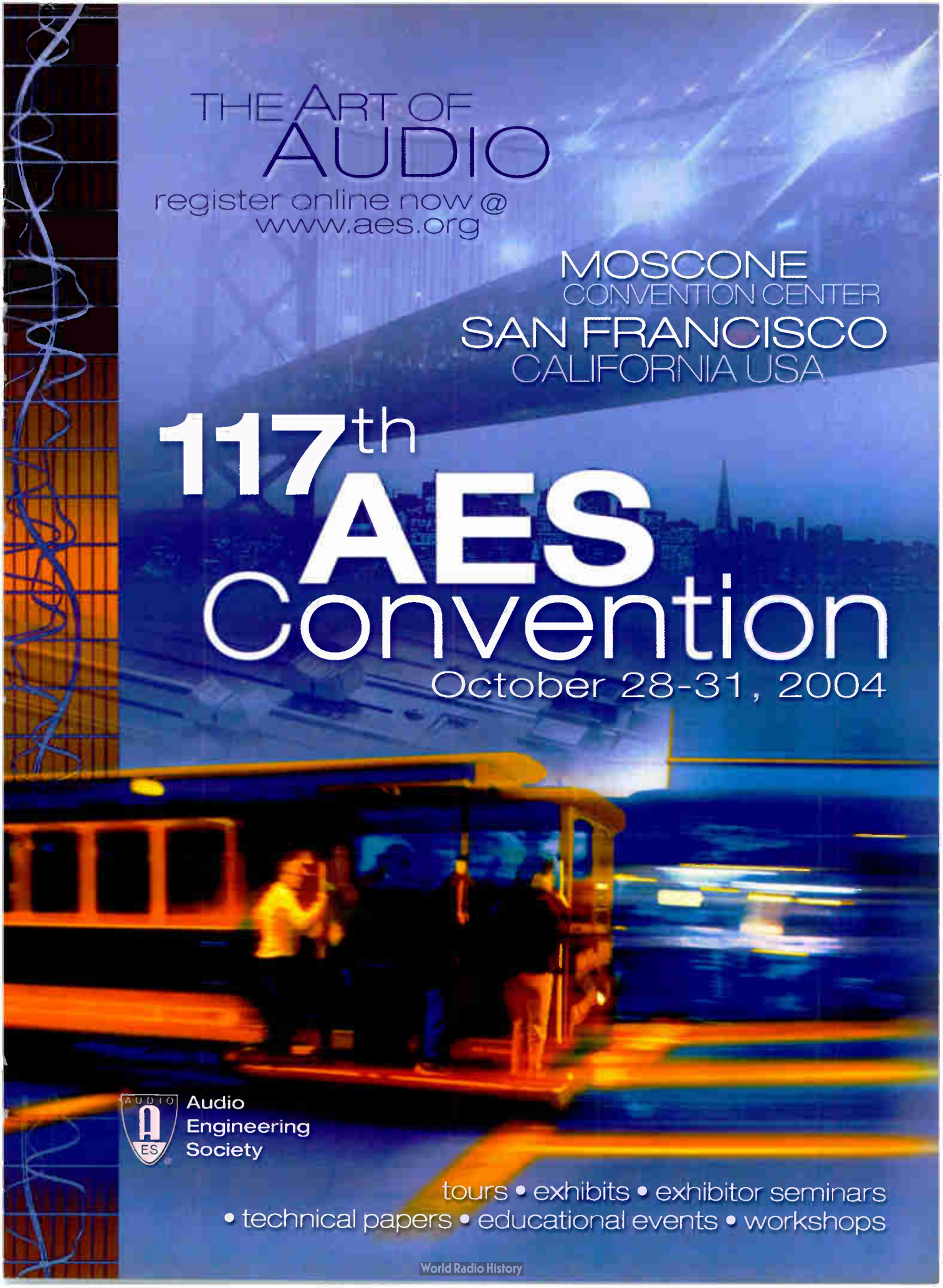
Blumlein was granted some 128 patents on subjects such as antennas and radar systems. In fact, it was such research that led to his death in 1942, when he and 10 others were killed during a secret flight testing a radar system. One can only guess at what wonders Blumlein could have devised had he lived another 38 years.

AEG

Magnetophon Tape Recorder (1935)

The genealogy of the tape recorder can be traced back to Valdemar Poulsen's early demonstration of magnetic sound recordings on a steel wire in 1899. Wire recorders never sounded very good, so in the 1920s, German inventor Kurt Stille came up with the concept of recording in steel ribbon—an improvement—but the medium was expensive and still couldn't match the fidelity of a 78 rpm disc. In 1928, Fritz Pfleumer was granted a

World Radio History



World Radio History

German patent for long paper strips coated with a magnetizable powder, which reduced the cost of ribbon recordings. In 1932, AEG chairman Hermann Bucher hired Pfleumer to work with Theo Volk and BASF chemist Friedrich Matthias to develop a magnetic tape recording system.

Innovations were many during the Magnetophon's three-year development. In 1933, Eduard Schuller invented a ring-shaped magnetic head that created a concentrated magnetic field without touching the tape surface. The BASF group put carbonyl iron powder on a tough cellulose acetate-base material that could easily be edited, yet was strong enough to handle the torque of the transport motors.

In August 1935, the Magnetophon K1 was unveiled at the Berlin Radio Fair. The first serious recording using this portable, self-contained recorder was in November 1936, with Sir Thomas Beecham conducting the London Philharmonic at BASF's concert hall near its manufacturing plant in Ludwigshaven. Other improvements followed, such as BASF's ferric-oxide tape in 1939 and Walter Weber's rediscovery and application of high-frequency AC biasing, which had been known since the 1920s, giving the 1941 Magnetophons a bandwidth of 10 kHz.

Bing Crosby with his beloved Ampex 200A recorders

ALTEC LANSING

Voice of the Theatre Speakers (1947)

From the big cities to the farms and small towns, American life in the post-WWII era was good. Besides the return of thousands of GIs from overseas, an end to wartime shortages and rationing meant that people could live it up and enjoy life without feeling guilty. Hollywood was booming and the theater business prospered, offering an evening of entertainment everyone could afford. So the timing was perfect when Altec co-founder Alvis A. Ward announced the original Voice of the Theatre Series in 1947.

Designed by John Hilliard, Voice of the Theatre was a line of high-performance, two-way cabinets made up of a number of huge (9- to 10-foot-tall) low-frequency enclosures that put one to four 15-inch Model 515 woofers on a wide-flare bass horn. The LF boxes supported large multicell horn(s) with the new Model 288 HF compression drivers, and could be mated with bolt-on wing panels that extended the bass response. It worked. In fact, the sonic improvements that Voice of the Theatre speakers offered made them an immediate hit with studios, theater owners and the general public. Approved by the Research Council at the Academy of Motion Picture Arts and Sciences, they became the industry standard for decades.

In the early 1950s, Altec unveiled the Voice of the Theatre A7, a compact (5-foot/180-pound!) two-way product suited for smaller cinemas and multichannel installs in the burgeoning stereo theater market, as well as for studio monitoring and home systems—the latter offered in a walnut cabinet model. The A7's high 103dB (1W/1m) sensitivity made them an ideal match for the low-wattage power amps available at the time, and they became the popular P.A. choice of a zillion bars, dubs and rock bands throughout the 1960s and '70s. More recently, Altec has reissued the A7 in a special "A7 Legacy" edition for the home stereo/pro market.

AMPEX

Model 200A Tape Recorder (1948)

The story of the 200A—the first tape recorder from Ampex—is inextricably linked to the history of the German Magnetophon. After World War II, an engineer by the name of John Mullin brought two older Magnetophons back as war souvenirs, modified them for HF bias and demonstrated them to Bing Crosby, who used them to record, edit and play his weekly ABC radio shows. Helped in part by the U.S. government's declaration that all German and Japanese patents were invalid, the decks were studied by the fledgling Ampex Corp., which launched its own recorder program.

The Ampex engineering team for the 200A included Harold Lindsay and Myron Stolaroff, who kept many of the Magnetophon's basic features such as 30 ips operation and a B-wind design, in which the tape was wound with the oxide facing out. Unlike the portable Magnetophon, the Model 200A tape had a huge polished black wooden console and heavy anodized-aluminum fixtures and fittings. Recording one track across the full width of the ¼-inch tape, the 200A was capable of performance that was flat within 0.5 dB from 30 Hz to 15 kHz.

In October 1947, the first 200A prototype was demo'ed at Radio Center in Hollywood; the enthusiasm by those who heard this wonder machine was apparent, and Ampex moved forward into regular production,

World Radio History

Introducing the all-new

MIX ONLINE

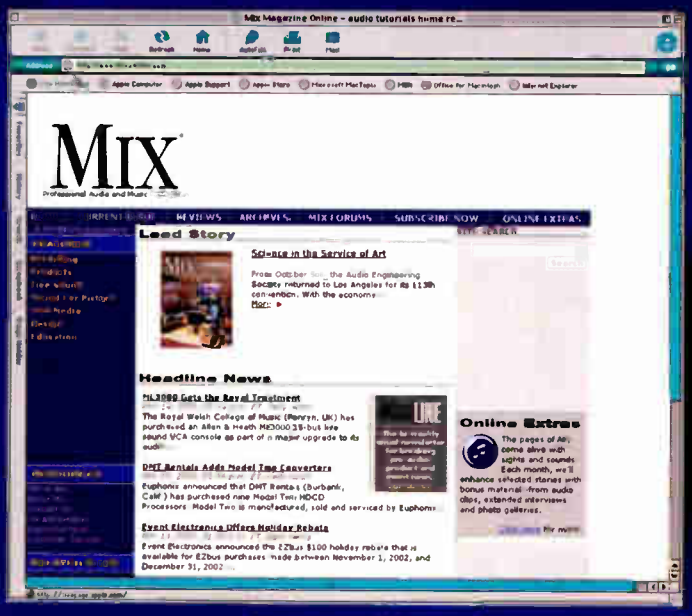
THE PAGES OF MIX COME ALIVE WITH SIGHTS AND SOUNDS!

IMPROVED NAVIGATION provides fine-tuning of searches.

ONLINE EXTRAS enhance selected stories with bonus material from audio clips to extended interviews and photo galleries.

FEATURED CONTENT CATEGORIES offer broader and categorized content searches in the fields of Recording, Products, Live Sound, Sound For Picture, New Media, Design, and Education.

EXPANDED applications, daily news, current issue previews, access to reviews, archives and subscriber resources.



There is so much to see on the new mixonline.com, you won't believe your eyes. Or your ears.

WWW.MIXONLINE.COM

World Radio History

with units serial #1 and #2 delivering in April 1948 in time to record and edit the 27th Bing Crosby show of the 1947-'48 season. A 200A retailed at $4,000—nearly as much as a house at that time—but the convenience of editing and the ability to time-delay performances appealed to Crosby, who no longer had to perform separate shows each week to reach different time zones. Weeks later, ABC ordered 12 more recorders and other broadcasters soon followed. In all, only 112 of the 200A recorders were made (the $1,500 model 300 followed it), but the impact of the benefits of tape-based production was felt throughout the world.

NEUMANN

U47 Microphone (1949)

The U47 was not Neumann's first microphone or even its first mass-produced condenser mic; those honors go to the CMV3 "bottle" condenser mic, which first appeared when Georg Neumann founded the company in 1928. However, as the first *multipattern* condenser, the U47 ushered in the era of the modern studio mic, and even more than 50 years after its birth, it remains one of the world's most sought-after and desirable studio tools.

The U47 featured a high-performance (and now nearly impossible to find) VF14 tube and the dual-diaphragm M7 capsule—essentially back-to-back cardioid capsules that combine to create an omni pattern, or can be used singly for a cardioid pickup.

But the birth of the U47 was far from easy: Soon after the war, Neumann moved its plant back to Berlin in a rented building on Genestrasse, where the 10 Neumann employees had replaced the blown-out windows with cardboard, as no glass was available in the capital. But the company was determined, and Georg Neumann had a backlog of new ideas (such as his invention of the sealed NiCad battery) and was anxious to contribute to the reconstruction of Europe.

Due to distribution issues with Telefunken and post-war production snags, the U47 officially debuted in 1949. The Telefunken U47s—which other than the logo, were 100% identical to the models bearing the Neumann name—were sold to European broadcasters and to the U.S. market, where they soon replaced RCA ribbons as the studio mic of choice. Over the years, the accolades for Neumann products have been many. The company has garnered an unprecedented seven TEC Awards for microphone excellence, and received a Technical Grammy® Award in 1999 for the contributions of the Georg Neumann company over the years.

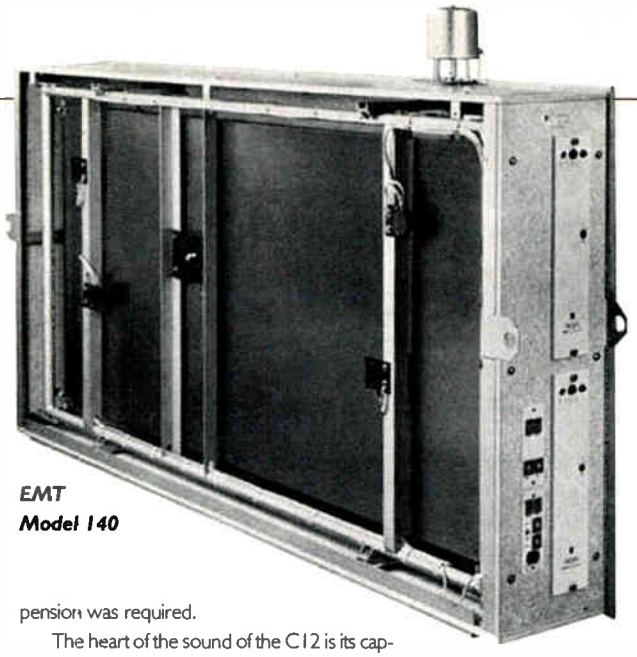
AKG

C12 Multipattern Tube Microphone (1953)

Besides making history as the first true multipattern microphone with remote polar control, AKG's C12 sounded great (and is still highly prized today) and laid the foundation for more than a half-century of future AKG mic designs. Developed by AKG engineer Konrad Wolf, the C12 included an external box for selecting any of nine polar patterns, and its slender tubular housing was more compact than Neumann's U Series and featured internal shock-mounting, so no external elastic suspension was required.

The heart of the sound of the C12 is its capsule, which uses a dual-backplate design invented by two Siemens engineers and results in consistent on-axis sensitivity when the polar pattern is changed. The C12's CK-12 capsule paired the dual-backplate approach with two 10-micron diaphragms. (Two years later, the CK-12 capsule was upgraded to 6-micron Mylar capsules.) To expand AKG's postwar distribution, the mic was also re-branded by Telefunken as the M251 and as Siemens' SM 204. In the 1960s, as tube mics were losing popularity to the "convenience" of solid-state FET designs, the C12 was discontinued, later to resurface in slightly different forms. In 1983, "The Tube" used a C-414 capsule with the original C12 tube electronics but in a smaller body. The C12 finally reappeared in a more accurate re-creation in 1994, as the C-12VR (vintage reissue), which paired the C12 electronics with a re-tuned CK-12 capsule that simulated the acoustic signature of the orignal C12.

A stereo version of the C12, the C24, was created in 1959 by stacking two identical capsules that could be rotated to vary the stereo perspective. As with the C12, the polar patterns of both C24 capsules can be changed—again, nine choices are offered—so the mic is capable of X/Y, Mid-Side or Blumlein (crossed figure-8) stereo-miking.



EMT Model 140

EMT

Model 140 Plate Reverb (1957)

Today, with the proliferation of low- and high-end digital reverberation, room simulators and the like, it's hard to recall a time when adding a little 'verb to a track was a complicated undertaking. Natural reverb has always been available, and it was always possible to create reverb while tracking using a distant room mic or placing your sound source in a reverberant space, such as a bathroom or stairwell. A few studios even went so far as to build reverb chambers—hard-surfaced rooms equipped with a mic or mics to pick up a speaker feed. Less well-heeled studios could always use their hallways in a pinch. However, electronic reverberation finally appeared with the debut of the Model 140 from German company EMT (Elektromesstechnik).

Developed by Dr. Walter Kuhl at the Institute for Broadcast Technology in Hamburg, the EMT 140 used the concept of vibrating a large, thin metal sheet (about 1x2 meters and half a millimeter in thickness). The metal plate was suspended by springs from a rigid metal frame enclosed in a heavy wooden case. The vibrations were generated by a center-mounted transducer (essentially a speaker-style driver) that was amplified and fed from an effects send, with the reverb output coming from a mic-style pick-up transducer placed at the outside of the plate. The system's "reverb time" was controlled (or at least kept from going out of control) by a damping pad that pressed against the plate.

World Radio History

Our Sound Arts Program is the fastest way to move from behind the bar to the front of the soundboard. Want to record live music? Author DVD's? Learn all about post-production for film & TV? Then Ex'pression is exactly where you want to be.

Everything here is hands-on. No other school can match our incredible, state-of-the-art, digital and analog equipment. For two years, you'll do nothing but eat, sleep and dream in stereo. (Maybe even 5.1 surround?) And after you get your degree, you'll have a career waiting. Rather than just waiting around for tips.

Ex'pression College For Digital Arts > expression.edu > 1.877.833.8800

Visit us at AES, Booth # 309

World Radio History

The results hardly sounded like a cathedral but were thick and diffuse, and well-suited to vocals and drums. Given their massive size, 400-plus-pound weight and need to be placed in a vibration-free/noise-free space, plates were hardly the perfect solution but sounded far better than spring reverbs and were much cheaper than building acoustic chambers. In 1961, EMT debuted the Model 140S, which added a second output pickup for a stereo effect. Even with the power of modern DSP to conjure up almost any space, nearly all of today's digital reverbs include plate reverb programs.

Dolby A301 A-type noise-reduction unit

TELETRONIX

LA-2A Leveling Amplifier (1965)

Some 40 years after its invention, the story of the Teletronix LA-2A continues to be written, but one thing that remains constant is the demand for this mono optical tube compressor limiter, even in these days of digital production. Originally patented by Jim Lawrence in 1965, the LA-2A was produced by Teletronix in Pasadena, Calif., which soon after became a division of Babcock Electronics. A few years later, Babcock's Broadcast Products division was acquired by Bill Putnam's Studio Electronics Corporation, shortly before he changed the company name to UREI.

The LA-2A's gain control scheme was revolutionary: Gain reduction was controlled by applying the audio voltage from a tube peak detector to an electroluminescent panel that glowed onto a light-sensitive, cadmium-sulfide resistor, with a second matched photoconductive cell controlling the metering section. With up to 40 dB of smooth gain limiting, flat 30 to 15,000Hz (±0.1dB) frequency response and low-noise performance, the LA-2A soon became a studio standard.

By 1969, tube gear had fallen out of favor, and the LA-2A was replaced with the "improved" solid-state LA-3A. Later, UREI was purchased by Harman Professional, which made a couple short (200-unit) reissue runs of the LA-2A—first in the late-'70s and then in the 1980s. In 1999, the sons of Bill Putnam regained the UREI brand from Harman and began manufacturing meticulously hand-built LA-2As, 1176s and other UREI studio gear under the Universal Audio brand, delivering the first products in May 2000. The industry's reaction to these classic re-creations has been overwhelmingly positive. Imagine that.

SHURE

SM57 Dynamic Microphone (1965)

How exactly does a $99 microphone become a Hall of Fame inductee? Well, if that mic is the Shure SM57, the answer comes easy. For four decades, the SM57 has proven itself in perhaps the most demanding application of all: delivering solid, dependable performance placed in front of amp stacks or an inch or so above (and below) snare drums, where the excruciatingly high sound pressure level would cripple lesser mics. Yet that same mic has been the presidential microphone of choice, capturing press conferences and speeches for every U.S. chief executive since Lyndon Baines Johnson. In fact, Shure even offers a "VIP Dual Microphone Kit" that includes all of the hardware and cabling to use two SM57s side-by-side for fail-safe vocal coverage of important events.

The lineage of the SM57 began when Shure engineer Ernie Seeler developed the Unidyne III capsule, a cardioid dynamic design that continued the evolution of Ben Bauer's original 1939 Unidyne (the first single-element unidirectional mic). After three years of hard work and hundreds of tests involving dropping, throwing, cooking, salt spray immersion and submerging, the SM Series was born, and Seeler's same capsule design was employed for the SM57 and its vocal counterpart, the SM58.

It's somehow ironic that Seeler—a classical music devotee who despised rock 'n' roll—created two of the mics that 40 years later remain a mainstay of rock music. Today, it's the rare session—rock, pop, R&B or country, onstage or in-studio—that doesn't have an SM57 on a drum kit somewhere, even when far-more expensive microphones are available.

RAY DOLBY

Dolby A-Type Noise Reduction (1966)

Ray Dolby has lived and breathed audio since his earliest years. While still in high school, he worked at Ampex, first doing mundane chores such as copying alignment tapes for its new 200A tape recorder, and later as part of the company team that developed the first pro video recorder. After earning his BSEE from Stanford, he did postgraduate work at Cambridge, receiving a Ph.D. in Physics in 1961, followed by two more years of advanced studies. Dolby then spent two years working for UNESCO in India, during which time he considered ways of applying his thesis findings (on means of improving X-rays for clearer images) to noise-reduction methods for audio.

In 1965, he founded Dolby Laboratories to develop systems for reducing the background noise inherent in tape recording. The company's first product was the A301, which debuted in 1966 and provided one channel of A-type noise reduction. This sophisticated audio com-

World Radio History

pression/expansion system dramatically reduced background hiss inherent in pro recorders without discernible side effects. Unlike single-ended approaches, Dolby's treated low-volume signals only, leaving the loud signals that naturally mask noise unprocessed and divided the spectrum into multiple bands to prevent the pumping (noise modulation) common to conventional wideband companders.

The effect of Dolby noise reduction on the world's audio community—consumer and pro—was profound. It opened the possibilities of narrow-gauge/low-speed recording on formats such as the cassette tape and pro video recorders, as well home VCRs that would follow later. But on the pro audio side, Ray Dolby's invention helped fuel the fire of a multitrack recording revolution—something we can all appreciate.

TEAC

¼-Inch Simul-Sync 4-Tracks (1969)

Go back 35 years and there was no home recording market. In 1969, the first 24-tracks were becoming available, but choices for musicians were few—either go the full pro route or limit home recordings to stereo reel-to-reels, either with or without a "sound-on-sound" feature for layering new elements while recording over original creations, a "no-undo" process that required persistence and luck. At the same time, 4-channel consumer reel-to-reel decks for the quad market arrived; yet, with no provision for listening to earlier tracks while adding new tracks, overdubs were impossible.

Among those companies making quad recorders was TEAC, and in 1969, Dr. Abe and a small team of techs and marketing pros founded TEAC Audio Systems Corp (TASC, which in 1971 became TASC America or TASCAM) in a small office in Marina Del Rey, Calif. After opening as a custom shop to modify TEAC 4010 quad decks into the overdub-capable Simul-Sync

TCA 40 Series, TASCAM soon began making mixers and recorders for the home recording market and first exhibited its products at the 1973 AES show. Eventually, the 2340 and 3340 lines sold tens of thousands of units to a growing market of musician-recordists, almost single-handedly launching the home recording revolution.

Long before audio education became an industry unto itself, TASCAM gear provided a learn-by-doing sort of self-guided audio apprenticeship. Untold numbers of today's top recording engineers and producers learned the basics of multitrack music production (punch-ins/outs, console routing, optimizing gain structure, etc.), honing their skills on products such as TASCAM's Model 2, Model 5 and Model 15 mixers. And as small format 4, 8 and 16-track recorders emerged, a new industry of garage recording was born, with hundreds of today's large studios starting out from such humble beginnings.

LEXICON/GOTHAM

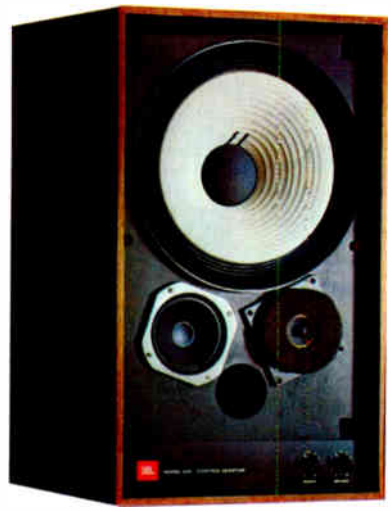
Delta T-101 Digital Delay (1971)

Pro audio was forever changed when Lexicon introduced the world's first commercial digital audio processor in 1971. The story began at MIT, where Dr. Francis Lee developed a digital delay unit for heartbeat monitoring. A teaching assistant, Barry Blesser (who years later would design the EMT 250—the world's first practical digital reverb), suggested that they try running audio through the system. The experiment resulted in a 100ms audio delay line, which was state-of-the-art for that time. Once the late Steve Temmer of New York City's Gotham Audio heard about it, he commissioned 50 units to help overcome live sound propagation delays and as a pre-delay for plate reverbs.

Thus, the Delta T-101 was born, with "Gotham Audio" on the front nameplate and "Lexicon" on the back. The original unit offered a 10k-Hz bandwidth and a 60dB signal-to-noise ratio—less than stellar, but remarkable for its time. Lexicon definitely felt that the specs were capable of improvement and the result was the Delta T-102 (sold under the Lexicon name), which pushed the noise down to an acceptable -90 dB and helped convince the industry that digital audio was a viable proposition.

JBL

4311 Studio Monitors (1974)



Once upon a time—meaning about 30 years ago—monitors in U.S. studios were either custom designs (typically developed from JBL or Altec components), Altec 604E coaxials in "utility" cabinets or JBL's large 4320 two-way horn systems. Based on the success of the 4320s, which had been designed with Capitol Studios and later developed a worldwide following, even being adopted as the standard studio monitor for Britain's EMI, JBL began looking into other studio products to ex-

World Radio History

pand its market share. The answer was the 4310, a high-powered three-way, all-cone system that was small enough to be suspended or placed on a shelf or console top.

The 4310 was a hit, but some at JBL felt that the 4310's popularity in the consumer realm would dilute its appeal to professionals. The 4310 then morphed into the L100, a hugely successful home product with the cool sculpted foam grilles; and JBL developed the 4311—an "all-pro" successor to the 4310.

The 4311 was built ground-up to be a "studio" monitor: It was available in textured gray or walnut finishes; the 12-inch 2213 cast-frame woofer had a 3-inch voice coil and a beefy 6.5-pound magnet structure; the 1.4-inch cone/dome tweeter had a foam surround to reduce diffraction effects; and it had easy-access, front panel presence and brilliance controls. But the 4311 had one feature not found on any of JBL's home speakers: Offering tightly clustered components that provided coherent imaging when the speakers were used in close-in listening, the 4311 was ideal for near-field applications such as meter bridge placement. In a matter of years, survey after survey from trade magazines noted that JBL monitors consistently led all others in its share of the studio monitor market.

With Visa card in hand, Abbey Road Studio manager Ken Townsend buys an SSL 4000 from Colin Sanders.

SOLID STATE LOGIC

SL 4000 Series Studio Console (1977)

There are many terms used to describe innovators in technology, but "visionary" certainly applies to Colin Sanders. More than 25 years ago, his design for the Solid State Logic SL 4000 mixer defined the modern recording console and changed an entire industry.

Sanders founded SSL in 1969 at age 22 to build electrical control systems for church organs. By the early '70s, SSL moved out of Sanders' parents' house in Oxford to a nearby village where a workshop and studio were set up. When Sanders decided to upgrade the studio for multitrack capability, he launched an intensive R&D project, studying existing consoles, while planning to add advanced features such as computerized automation, dynamics and transport control. Clearly, the board was designed for production-scale manufacturing from the very start, and the basis for a commercial product was underway.

At the 1977 AES convention in Paris, SSL debuted the first 4000 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 was sold in August '77 to Dick Cadbury's private studio near Oxford. The mixer had all the earmarks of the 4000 range: inline channels, small faders, track-arming and dynamics on every channel, computer-controlled automation and tape machine control. Later models continued the refinements (the current version is the SL 4000 G+) and today there are more than 3,000 SSL-equipped studios and facilities worldwide.

Sanders left SSL in 1991 to pursue various non-audio projects, including high-tech induction cooking systems and water filtration technologies. Sanders, an avid pilot, died in 1998 when his helicopter crashed outside his estate in a light fog.

THOMAS STOCKHAM

Soundstream Digital Recording System (1977)

For those who believe "digital" began with digital audio workstations in the late 1980s, it's important to remember that the first commercial digital recordings were made using Dr. Tom Stockham's Soundstream Digital system in 1977. 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 Fugueing* album on his Town Hall label. It worked, and later in the year, it was followed by recordings of the Philadelphia Symphony, Virgil Fox and the Boston Pops.

The Soundstream system was a 50kHz/16-bit process that stored audio on a high-speed instrumentation tape recorder. One of its most important features was its extensive and powerful editing and crossfade capabilities. The system—initially available only through rental on a per-project or hourly basis—remained in use for more than a decade.

Always looking ahead, Stockham's paper in the October 1977 *Journal of the AES* predicted future records on pocket-sized, 490MB digital discs, holding 60 minutes of music sampled at 42.5 kHz. Five years later, Sony/Philips would debut the CD, a pocket-sized digital disc format storing 60-plus minutes on a 540MB disc at a sampling rate of 44.1 kHz. Stockham—an AES president from 1982 to 1983—died earlier this year at the age of 70, but received many accolades during his life for his tireless contributions to audio, including an AES gold medal, SMPTE's Poniatoff Gold Medal, a Technical Grammy® Award and an Emmy Award.

World Radio History

NEW ENGLAND DIGITAL

Synclavier (1978)

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. But the story of the Synclavier began years before when a group of engineering students (Sydney Alonzo, Cameron Jones and Judd Burnham) in the Digital Hardware Lab at Dartmouth College created a small digital synthesizer to give computer-aided instruction in music with some composition language software and ear-training exercises. Based on the response to their simple prototype, the group applied for a grant to create a larger, multi-user system, and was able to license FM synthesis from Yamaha. In 1976, the students formed New England Digital and got a contract from the Norlin Corp. (which had just purchased Moog Music) to create some marketing prototypes.

Early in 1977, Norlin dropped the funding, NED got its technology back and with the availability of new 5.25-inch floppy disks, the group decided to create a portable musical instrument known as the Synclavier. The early units were fairly crude, but with the later debut of the Synclavier II, which offered polyphonic sampling and powerful synthesis capability (still favored by many top sound designers worldwide), NED was on the way.

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. In 1992, NED ran into financial difficulties and folded, abandoning hundreds of purchasers of these $100,000-plus systems, but a group of loyal owners formed a user's group to provide support and software updates. That spirit continues today at www.synclavier.com.

MEYER SOUND LABS

UPA-1 Arrayable Trapezoidal Speaker (1980)

Since its earliest days, sound reinforcement has traditionally been a very conservative market that was slow to acccept change. However, everything changed in 1980, when John Meyer unveiled the UPA-1, a compact, high-output, low-distortion two-way system with a little extra. From the outside, the UPA-1 was decidedly different: It was the first trapezoidal speaker (U.S. patent D271,967), now a common practice within the industry. Its sloped sides allowed the creation of tightly packed, wide-coverage horizontal arrays to minimize the comb-filtering effects that occur when spaced drivers reproduce the same frequencies.

But the real revolution in the UPA-1 was less obvious to the eye. The speaker was designed to operate as a system, with the then-revolutionary concept of using an outboard active electronic controller. Placed just before the amplifier, the controller provided far more than mere crossover functions, also incorporating circuitry to optimize the system frequency response, phase response/driver alignment and signal limiting protection. Preset at the factory, the controller parameters were designed to optimize the performance of the system and not just the drivers themselves, allowing the UPA-1 to function like a much larger speaker.

The era of the modern sound reinforcement speaker began with the UPA-1 and continues its evolution today in the form of the UPA-1P, a version with 700 watts of onboard bi-amplification.

MACKIE

CR-1604 Mixer (1990)

Go back to 1989, and you'll enter an audio world that was pre-ADAT and pre-Pro Tools—even the first digital audio sequencer (Opcode's Studio Vision) was a year away, and an "affordable" digital 8-track was Yamaha's $30,000 DMR8. Yet the MIDI keyboard revolution was well underway, and musicians needed a mixer that was affordable, solid and good-sounding. The outlook seemed bleak for anyone looking to make decent music on a budget. Fortunately, help came in the form of Tapco founder Greg Mackie, who, in 1989, launched a new company bearing his name and sold a couple hundred of its first LM-1602 line mixers. But it was Mackie's CR-1604 compact 16-channel mixer, unveiled about a year later, that spawned a revolution of its own.

Besides offering rock-solid construction (frequently described as "built like a tank"), the CR-1604 ushered in some slick new concepts. Although a rack-mount design, it could easily be used as a desktop mixer: Its Rotopod chassis allowed connections to be accessed either from the front or the top of the

World Radio History

unit. The CR-1604 also had a rugged internal power supply, a feature that's almost unheard of in a market flooded with budget mixers using flimsy wall warts. But best of all, the CR-1604 did the impossible: It sounded great and carried a rock-bottom price.

Soon, Mackie had sold tens of thousands of the mixers. The audience included not only struggling bands and musicians, but also working pros everywhere who used them as submixers in high-end studios, on top tours, in post-production for feature films and covering live broadcast events such as the Olympics.

ALESIS

ADAT Modular Digital Multitrack (1991)

The Alesis ADAT changed the entire recording industry, beginning a revolution of affordable recording tools. Overnight, the cost of digital studio recording plummeted from a sizable $150,000 for the Sony PCM-3324 24-track to a relatively modest $12,000 for three ADATs at their original $3,995. The ADAT project was a collaboration of a huge design team, headed on the hardware side by Alesis founder Keith Barr (formerly the president of MXR) and with software development from Marcus Ryle (founder of Line 6) of Fast Forward Designs.

Unveiled at the Winter NAMM show in Anaheim, Calif., on January 18, 1991, ADAT was a compact studio recorder that could store eight tracks of digital audio (at better-than-CD quality) on an S-VHS tape, and could be interlocked with up to 15 other ADAT units, providing up to 128 tracks in all. ADAT finally delivered more than a year later, but in that time, ½-inch analog 8-track sales came to a virtual standstill, and for a while, every conversation in the industry seemed to be centered around this newcomer on the digital multitrack block.

The advantages of ADAT's modular digital recording approach were many: The system used inexpensive, commonly available S-VHS tapes; the machine sync was sample-accurate; creating clone safety backups was easy; and users just bought/borrowed/rented more transports for more tracks. Meanwhile, ADAT simplified long-distance recording with session players and opened up the concept of megatracking, in which as many additional takes as possible could be recorded simply by switching tapes in a multi-transport system. The original 16-bit/48kHz ADAT was later upgraded to 20 bits, and other companies (Fostex and Studer) adopted the format. Eventually the popularity of the ADAT (and competing Tascam DA-88) diminished, mostly due to the rise of inexpensive disk recording systems, but its legacy lives on in the innovative Lightpipe 8-channel, fiber-optic standard that remains in everyday use.

DIGIDESIGN

Pro Tools (1991)

On January 20, 1989, Digidesign founders Evan Brooks and Peter Gotcher unveiled Sound Tools, a Mac-based (SE or Mac II) 2-track digital recording/editing system. Offering outboard converters, Sound Designer II software and a $3,995 price tag, Sound Tools was ideal for editing DAT tracks, and its SD II file format became (and remains) a worldwide standard for digital file exchange.

In 1991, Digidesign made a giant step with its debut of Pro Tools, a Mac-based system that integrated multitrack digital audio recording/editing, DSP and onscreen digital mixing. The platform originally supported four to 16 independent I/O channels, analog and digital I/O and SMPTE sync; systems were priced from $5,995 (less the $6,700 for a Mac IIci—including 4 MB of RAM and an 80MB hard disk). The system has since evolved fifty-fold, expanding to provide full 192kHz/24-bit resolution, MIDI sequencing, TDM DSP plug-ins and cross-platform (PC/Mac) support. The latest iteration is the current Pro Tools|HD, and recent upgrades include a variety of controllers, from compact, all-in-one Digi002 systems to ICON, a fully integrated console environment featuring the D-Control™ tactile worksurface.

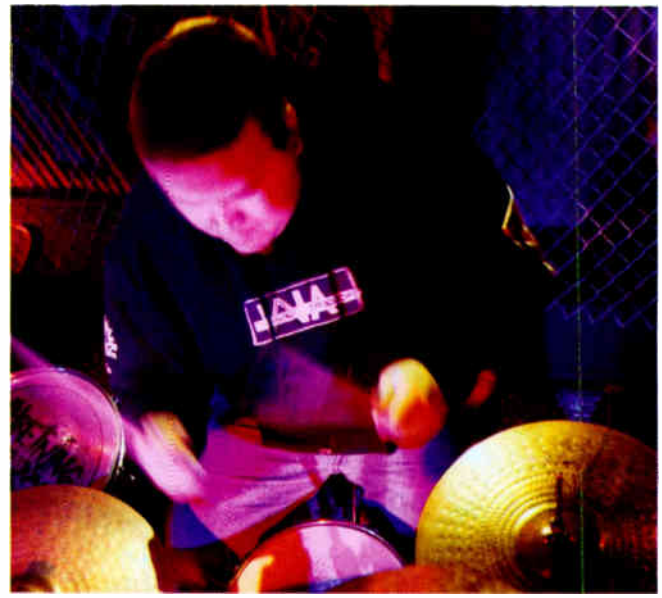
Today, with tens of thousands of users worldwide, Pro Tools has become the audio production standard for music and post pros, and accolades include Academy® and Grammy® Awards, as well as an unprecedented string of five consecutive TEC Awards. ■

When not researching audio history at Mix, George Petersen is building a WiFi Elcassette-to-Edison cylinder converter for transferring PCM-F1 tapes to wire recorder format. He also reminds readers that digital audio can be transmitted using semaphore flags (Red up = 0, White up = 1), but warns that 192kHz transfers can be slow.

World Radio History

The Hearing and Sound Connection...

The House Ear Institute Targets Audio Professionals



By Marilee Potthoff

Only a few years ago, when hearing professionals at the House Ear Institute asked people in the audio and music industries if they would consider wearing hearing protection, the response was typically a laugh and a, "Are you kidding? No one worries about that!" Or, more commonly, "Hey, I'm already deaf."

There now exists a whole generation of professional sound veterans and musicians whose careers began during the early days of loud rock 'n' roll, and who have suffered irreversible damage to their hearing. But, until recently, they had access to little or no information about the dangerous connection between high-decibel sound exposure and permanent hearing loss. As a result, some of these professionals, now in their 40s and 50s, have a level of hearing loss that affects their ability to communicate.

Sound Partners to the Rescue

It was in this climate that, in 1997, with the support of the Mix Foundation, the House Ear Institute launched its Sound Partners hearing conservation program for audio engineers, musicians and other sound professionals. The program began as an offshoot of an earlier effort developed in 1986, the Institute's Hearing Is Priceless (HIP) program, whose goal it was to provide teaching aids for elementary school health classes around the country. At that time, *Mix*, through its foundation, took an active leadership role in the Institute's educational outreach by designating the HIP program as a major beneficiary of proceeds from the TEC Awards.

During the decade that followed, the HIP program saturated 1,000 school districts across the country with its "HIP Talk" video program and supporting educational tools. Through its support of the HIP program, the Mix Foundation and its industry supporters began to recognize the need to educate their audio industry colleagues about the seriousness and risks of noise-induced hearing loss and what tools were available to protect themselves.

Building Awareness

In 1997, at the Audio Engineering Society Convention in New York, the House Ear Institute joined with the Mix Foundation to produce the Sound Partners hearing conservation program for audio and music professionals. No other comprehensive program of its kind was available to educate the industry about what had already become a serious and pervasive problem for thousands of industry professionals.

Over the ensuing seven years, the overall awareness level and receptivity to learning about the risks and prevention of noise-induced hearing loss has experienced remarkable changes. Many of the audio professionals, who were at one time quick to dismiss the notion of hearing conservation practices in their work environments, are now among the first to sign up for the free hearing screenings at trade shows and help spread the hearing conservation message to their colleagues. Many return on an annual basis to have their hearing screened at industry trade events.

"The level of awareness among audio professionals about sound exposure and hearing health has grown exponentially since the issue was introduced in earnest to the industry in 1997," said James D. Boswell, CEO of House Ear Institute. "The Institute recognizes how important hearing

In a TEC Awards reversal, Charlie Lahaie of the House Ear Institute presents the Mix Foundation with a certificate of appreciation. From left: Lahaie, David Schwartz, Karen Dunn, Hillel Resner and Penny Riker.

World Radio History

conservation education is to those who are working in pro sound, and we continue to broaden our Sound Partners program outreach efforts to ensure this positive educational trend continues."

The challenge to individuals in recognizing risk to their hearing is compounded by the advances in audio technology. Today's digital audio allows listeners to turn the volume up without experiencing the same signal distortion that occurred at extreme decibels with analog audio. While everyone benefits from the clearer, cleaner signals, the improvements have blurred the ability to distinguish when loud sound may be too loud for our auditory system to tolerate.

New Study of Audio Pros

This past April, the House Ear Institute announced the findings of the first study of its kind to analyze the impact and prevalence of noise-induced hearing loss within the audio and music industries. The study, conducted by Rachel Cruz, M.A., CCC-A/FAAA, a research audiologist at House Ear Institute, utilized data compiled from thousands of hearing screenings conducted at audio and music industry trade shows over the course of seven years, as part of the Sound Partners program.

The study indicated that high-frequency hearing loss from noise-induced inner ear damage is evident in this sector of the population that is repeatedly exposed to high levels of sound. Even when thresholds were within normal limits, all groups shared a characteristic "noise-notch," or loss of hearing sensitivity, around the 4 to 6kHz frequency range. The study further confirmed that compared to the general population, both men and women in music and sound careers show more hearing loss across all age groups. This study reinforces the need for a strong hearing conservation educational program and guidelines that industry professionals across the board can apply to their work.

While the program will continue to expand its educational efforts targeting the music and audio professions, the Institute is preparing to launch a multi-tiered public hearing health campaign next year that targets teens and young adults, who also are at significant risk of noise-induced hearing loss, but who lack real awareness of the facts.

Tools for Hearing Health

One of the biggest priorities for Sound Partners in 2005 is to expand the educational information and resources available on its Website, which is becoming an increasingly powerful conduit for hearing conservation information, including downloadable classroom tools.

"Our goal is to offer a comprehensive selection of educational materials on hearing conservation to people wherever they are in the world," said Boswell. "Whether the need is technical information for the audio professional, class materials for professors to download, or quick facts for the listening public, people will be able to easily find this information, along with many other hearing health topics, directly from our Website at www.hei.org."

Visitors can already take an online, state-of-the-art hearing test, called the HINT, or try out the hearing loss simulator and get the latest online facts about NIHL (noise-induced hearing loss). An online hearing conservation course is also under development for use by educators and sound industry professionals, and will be available on the Website within the next two months.

Sound Partners also offers a selection of printed materials, including educational brochures, earplugs, hearing conservation fact sheets and wall posters that provide customers and employees with the decibel levels of everyday sound-related activities at a glance. At the same time, Sound Partners continues to increase its visibility and resources at audio and music trade shows and in the news media.

As Sound Partners moves ahead with new outreach opportunities, it is exploring innovative ways for audio industry professionals to become stronger advocates of hearing conservation and the hearing health of the listening public. Log on and visit; your ears will thank you. ■

To learn how you or your organization can become involved in the Sound Partners hearing conservation program, or for additional educational information, contact Marilee Potthoff, director of marketing and outreach, House Ear Institute at mpotthoff@hei.org.

House Ear scientists research the inner ear's structure

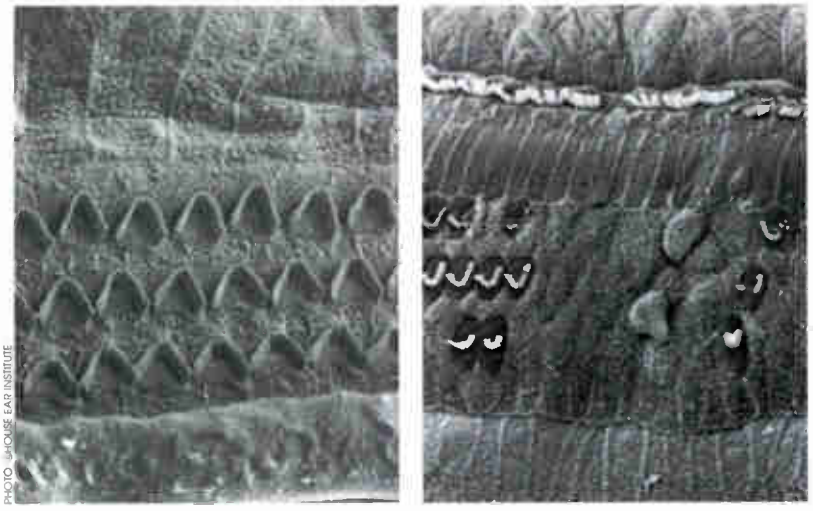


PHOTO: ©HOUSE EAR INSTITUTE

Left: Healthy inner ear cells
Right: Damaged inner ear cells

World Radio History

Ad Index

Advertiser Name	Website	Page
AKG Acoustics	www.akgusa.com	9
Audio-Technica	www.audio-technica.com	19
Ex'pression Center for New Media	www.expression.edu	31
Genelec	www.genelec.com	25
Mackie	www.mackie.com	21
Meyer Sound	www.meyersound.com	IFC-1
Mix Foundation	www.mixfoundation.org	17
MOTU	www.motu.com	BC
Neumann/USA	www.neumannusa.com	IBC
Obedia	www.obedia.com	11
Shure	www.shure.com	15
Solid State Logic Ltd.	www.solid-state-logic.com	3
Tascam	www.tascam.com	7

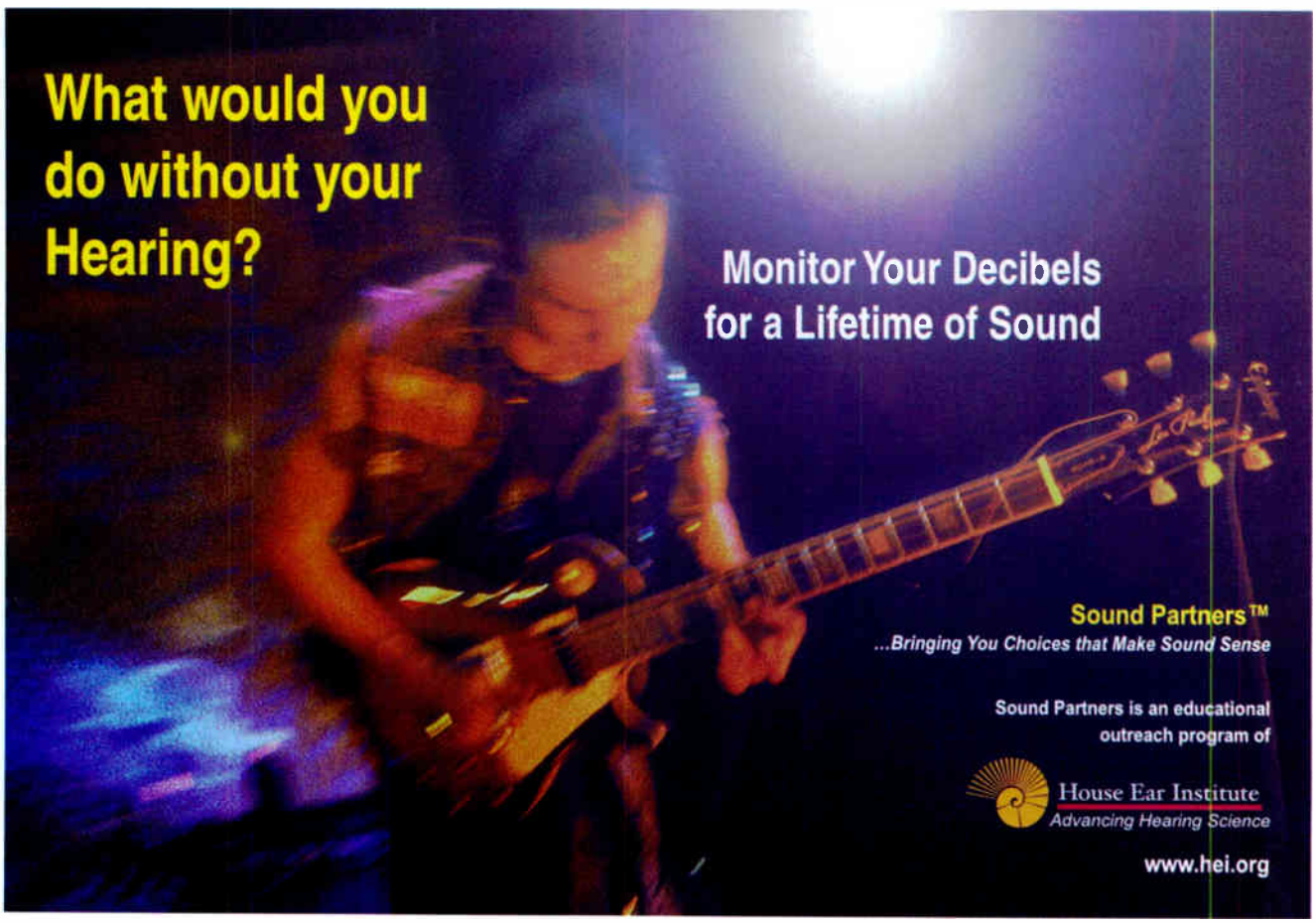
MIX ADVERTISER SALES REGIONS AND REPRESENTATIVES

Northwest/North Central
Greg Sutton
847/968-2390
gsutton@primediabusiness.com

Southwest
Albert Margolis
949/582-2753
amargolis@primediabusiness.com

East Coast/Europe
Michele Kanatous
718/832-0707
mkanatous@primediabusiness.com

Classifieds
Kevin Blackford (West Coast)
Jason Smith (East Coast)
800/544-5530 or 510/653-3307
mixclass@primediabusiness.com



World Radio History

The Legend of Les

PHOTO © 1975 WILLIAM P. GOTTLIEB WWW.JAZZPHOTOS.COM USED BY PERMISSION

In the spirit of Technical Excellence and Creativity, we'd like to offer a tip of the hat to musician/innovator extraordinaire Les Paul, (shown here in 1947) who invented the solid body electric guitar and the multitrack recorder. Keep those great ideas coming, Les!

World Radio History

20 Years of TEC Awards

75 Years of Great Neumann Mics

Last year, Neumann celebrated its 75th anniversary. Since its inception, Neumann has continued to expand its offerings, providing the absolute finest microphones for any application (and winning six TEC awards in the process).

Neumann is honored to be inducted into the TEC Awards TECnology Hall of Fame for our U 47. Thanks to the Mix Foundation for providing such a valuable resource, and thanks to Neumann users the world over.

Neumann USA

www.neumannusa.com

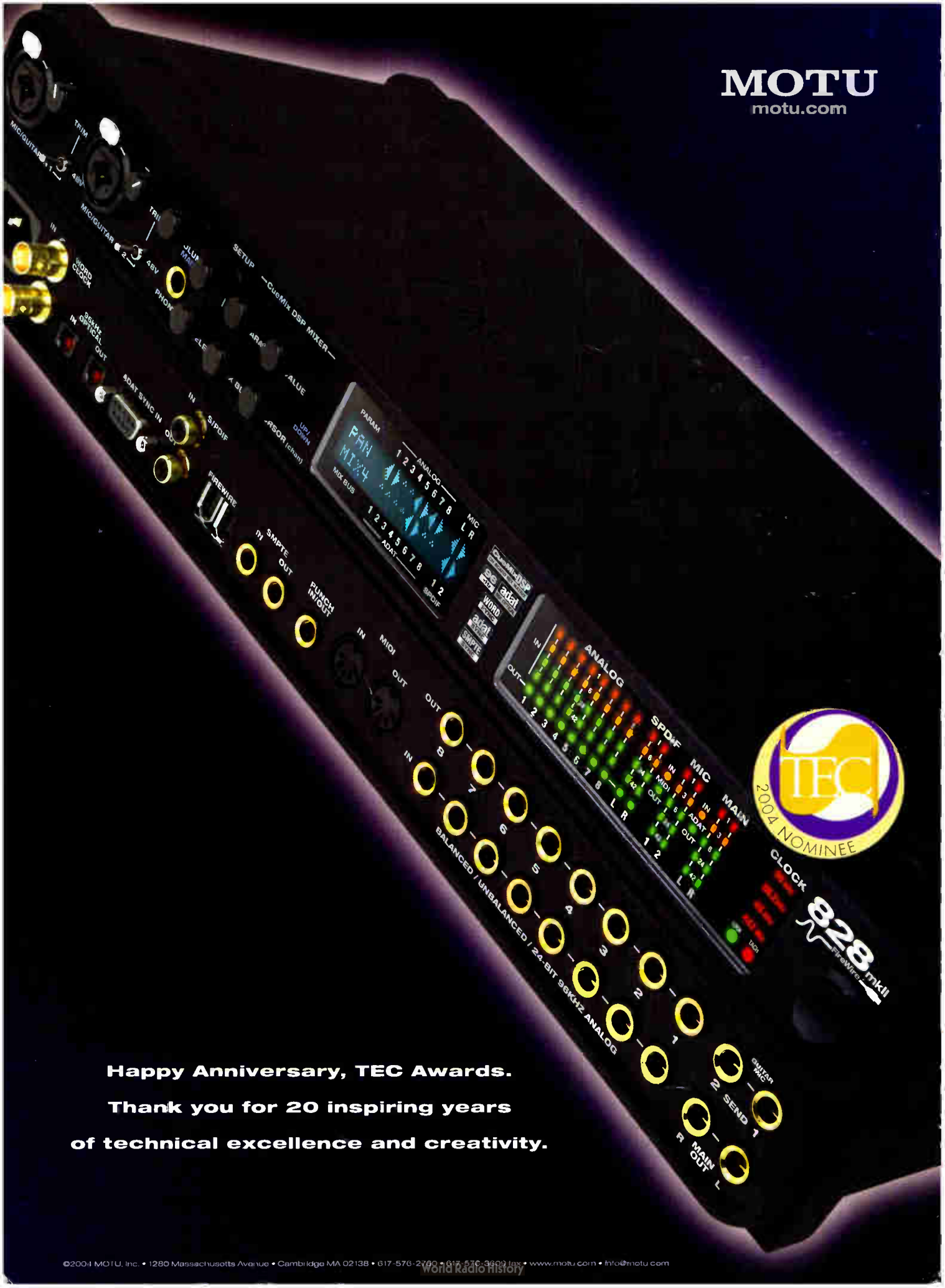
Distributed by Sennheiser

USA: Tel: 860 434 5220 • Fax: 860 434 3148

Canada: Tel: 514 426 3013 • Fax: 514 426 3953

Latin America: Tel: 52 55 5638 1020 • Fax: 52 55 5639 9482

World Radio History



©2004 MOTU, Inc. • 1280 Massachusetts Avenue • Cambridge MA 02138 • 617-576-2760 • 617-576-3609 fax • www.motu.com • info@motu.com
World Radio History