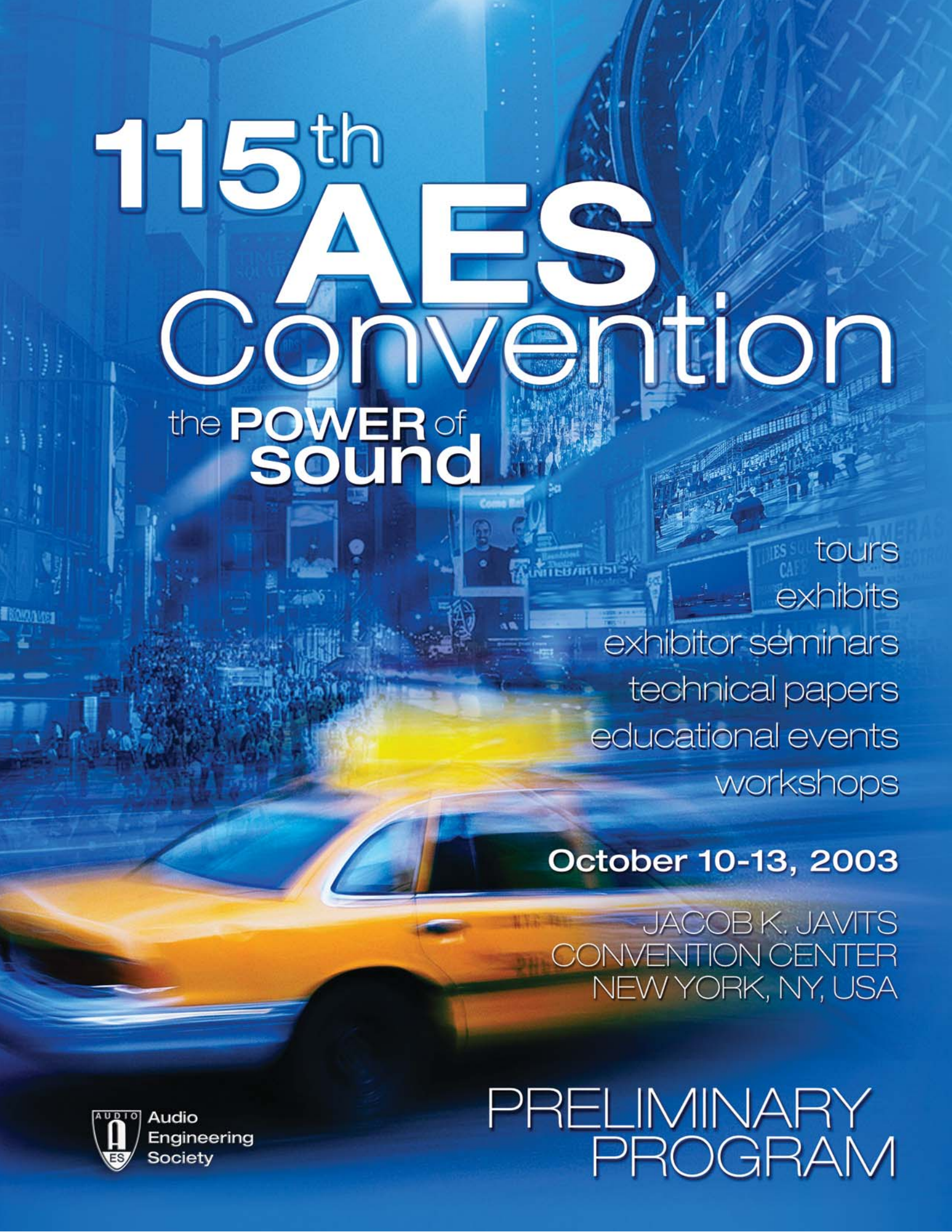
115th AES Convention
the POWER of sound
tours
exhibits
exhibitor seminars
technical papers
educational events
workshops
October 10-13, 2003
JACOB K. JAVITS CONVENTION CENTER
NEW YORK, NY, USA
PRELIMINARY PROGRAM
Audio Engineering Society

CHAIRMAN'S WELCOME

The AES 115th Convention is a collection of extraordinary events, drawing upon the latest developments in audio technology. This year's technical program will offer more selections than ever before, and illustrates how far reaching the "Power of Sound" can be.

Especially exciting are the new additions to the AES Convention program. For the first time at a US show, Exhibitor and Tutorial Seminars will be presented, offering convention visitors a chance to see detailed showcases of products, and take advantage of lectures and presentations on a wide range of topics. The AES furthers its role as an educator this year, with a new student design competition. This competition will encourage the design engineers of tomorrow to become even more involved in the industry.

The opening ceremonies are a chance for the industry to recognize and salute those luminaries who have contributed to the audio industry. Our keynote will be Arif Mardin, one of the prime architects of contemporary music for more than four decades. Mardin's discography reads like a who's-who in the history of rock, soul, and rhythm and blues. Mardin recently scored another bulls eye with the massive success of new artist Norah Jones.

As the live sound arena continues to thrive, we are pleased to be showcasing the latest in surround sound technology with the presentation of Surround Live! This is the first time an AES convention has featured a comprehensive event devoted exclusively to the creation, production and reproduction of live performance audio in multi-channel surround. It's being offered as a one-day interactive workshop, and is a don't miss for those live sound engineers.

By joining your colleagues at the 115th Convention of the Audio Engineering Society, you are assured an experience that is both informative and entertaining and the opportunity to be a part of the premier audio event of the year. The AES looks forward to seeing you in bustling New York City!

Zoe Thrall
115th AES Convention Chair

The AES returns to New York! The 115th AES Convention, the premier audio event of the year, will explore the latest technological advances in the audio world. A comprehensive showcase of audio technology combined with a stellar line up of papers sessions, tutorials, workshops, technical tours and special events make the AES an invaluable resource for today's audio professional.

While addressing the issues our industry is faced with today, the AES also looks ahead to the future of audio. From breakthroughs in coding technology to the impact surround sound production has on today's mastering engineer, the AES has it covered.

ADVANCE REGISTRATION

Advance registration for the complete program and exhibits is highly recommended and offered at a reduced registration fee. To register in advance, please complete the enclosed form and fax or mail to the address indicated or register online at www.aes.org, where a secure server makes registration and payment by credit card easy.

The latest news and updated schedules can also be found at the AES web site.

Please note: The deadline for advance registration is September 30, 2003.

AT THE CONVENTION

The on-site Registration Desk will be located in the Crystal Palace at the Convention Center. Cash or credit cards (Amex/MasterCard/Visa) may be used for on-site registration.

INDIVIDUAL WORKSHOP, PAPERS, TUTORIAL SEMINARS AND TECHNICAL TOURS TICKETS

Attendees who are registered for exhibits can purchase individual tickets to workshops, papers, tutorial seminars and technical tours at the Education Desk located in front of the 1E Hall:

Workshops and Papers: **$35.00**

Tutorial Seminars and Technical Tours: **$20.00**

CONVENTION INFORMATION

Exhibit Hours

Friday, October 10th	Noon – 6:00 pm
Saturday, October 11th	10:00 am – 6:00 pm
Sunday, October 12th	10:00 am – 6:00 pm
Monday, October 13th	10:00 am – 4:00 pm

A list of participating exhibitors to date can be found on the back cover.

TRAVEL, HOTELS, AND ENJOYING NEW YORK

A number of hotel rooms in New York have been reserved for convention attendees at special meeting rates. For more information on the locations available, see the separate form and enclosed map. Please use this housing form to book your hotel. It is highly recommended that this be done as early as possible.

Reservations may also be secured online by visiting www.aes.org/events/115 and clicking on the Hotel Information link.

MEETINGS HELD IN CONJUNCTION WITH THE 115TH CONVENTION

Annual AES Business Meeting:
FRIDAY, OCTOBER 10, 8:30 AM - 9:00 AM—open to all AES members in good standing.

Technical Committee Meetings:
Coordinated by the AES Technical Council, the technical committees track trends in audio in order to recommend to the Society special papers sessions, standards, projects, publications and awards in their fields.

The TC meetings are open to all convention registrants and a meeting schedule will be available at www.aes.org (Technical Council).

Standards Committee Meetings:
Audio Engineering Society Standards Committee meetings, subcommittee meetings and working groups are open to the public. The working group meetings begin two days before the opening of the Convention.

The time and locations of the meetings are updated regularly on the AESSC web page.

SPECIAL EVENTS

Thursday, October 9
10:00 AM—6:00 PM

SURROUND LIVE!

Chair: *Fred Ampel,* Technology Visions

Vice-Chairs: *Keith Clark,* Live Sound International;
Mark Herman, Live Sound International;
Doug Jones, Columbia College, Chicago

Surround Live! Is the first ever, comprehensive event devoted exclusively to the creation, production and reproduction of live performance audio in multi-channel surround.

Offered as a one-day interactive workshop, on Thursday, October 9, 2003 in conjunction with the 115th Audio Engineering Society Convention in New York City, Surround Live! will take place at the Manhattan Center Studios complex's Grand Ballroom.

Surround Live! will bring together working professionals from the Tour Sound, Broadway Theater, Broadcast and Recording Industries to discuss the issues and technological challenges created by presenting music, drama, and theater in full multi-channel surround audio formats to an audience. Attendees will be able to experience the process of creating and

Thursday, October 9
10:00 AM—6:00 PM

Special Events are free of charge and open to all registered attendees, unless otherwise noted.

A variety of events covering a broad range of interests are planned to encourage all attendees, from students to seasoned professionals, to participate.

presenting multi-channel audio for a variety of live applications, and how this differs from the processes associated with multi-channel work done in a post-production environment.

EVENTS:

9:00 am–10:00 am: Registration at Manhattan Center
10:00 am–12:00 noon: Formal presentations
12:00 noon–1:00 pm: Lunch (included)
1:00 pm–2:00 pm: Formal presentations
2:00 pm–5:00 pm: Live performance demo and workshop on surround mixing
5:00 pm–6:00 pm: Panel discussion and conclusion

Registration Fees:

AES Members: USD 80 advance, USD 100 on site;

Non-members: USD 100 advance, USD 120 on site.

This fee includes coffee breaks and lunch and access to all four days of the 115th AES Convention Exhibits at the Jacob Javits Convention Center. *There are price reductions available to students or if you combine this Symposium with the Full Program registration for the 115th AES Convention.*

You are encouraged to register in advance, as there is a limit to the number that can be admitted to this symposium.

This event is in part sponsored and supported by Digico, Meyer Sound Labs, Shure and the TC Group.

Friday, October 10
11:30 AM—1:00 PM

OPENING CEREMONIES AND AWARDS PRESENTATIONS

The opening ceremonies include the AES awards presentation, which acknowledges the work of individuals whose outstanding contributions to the Society enhance our industry. A list of award recipients will appear in the Convention Program.

Keynote Address: ***Arif Mardin***, General Manager of Manhattan Records

Arif Mardin, has been one of the prime architects of contemporary music for more than four decades. A skilled pianist, arranger and composer, Mardin's discography reads like a who's-who in the history of rock, soul, and rhythm and blues: Young Rascals, Aretha Franklin, Barbra Streisand, Patti LaBelle, Bee Gees (yes, he's the guy who first got Maurice Gibb to sing in falsetto!), Average White Band, Hall and Oates, Roberta Flack, Bette Midler, Chaka Khan, and Phil Collins, to name just a few. Mardin recently scored another bull's eye with the massive success of new artist Norah Jones.

FRIDAY

Friday, October 10
1:30 PM—4:00 PM

REBUILDING OF NEW YORK BROADCASTING

Organizers: *David K. Bialik,* Systems Engineering Consultant
Howard Price, ABC

Panelists: *Joe Giardina,* DSI; *John Lyons,* Durst Organization; *Kevin Plumb,* WABC, WPLJ; *Steve Shultis,* WNYC Radio; *Thomas Silliman,* ERI Inc.

The effect of the events of September 11 marked the first time in recent history that a US major market needed to redesign an entire city's broadcast transmission system. Transmission facilities existing at the World Trade Center and Empire State Building before and after September 11 will be discussed, and the solutions implemented immediately after systems were disabled that day will be presented.

The event will also explore the transmission systems currently in place and feature a look at the new plans for the Empire State Building, 4 Times Square, and Freedom Tower.

Friday, October 10
4:00 PM—6:00 PM

15TH ANNUAL GRAMMY® RECORDING SOUNDTABLE

The National Academy of Recording Arts & Sciences, Inc. will present the 15th Annual GRAMMY® Recording SoundTable. This has become a very popular feature of AES conventions and this one promises to continue that trend. Further details will be available shortly.

Friday, October 10
7:00 PM—9:00 PM

AES MIXER

The AES Mixer is an informal get-together where you can your industry friends and colleagues in a social atmosphere after the day's activities.

Saturday, October 11
9:00 AM—11:00 AM

LIBRARY OF CONGRESS

Moderator: *George Massenburg*

Panelists: *Peter Alyea,* LOC;
Samuel Brylawski, LOC

The panel will discuss the criteria used to select the first fifty recordings for the National Registry of Recorded Sound. This is the first part of an ongoing project.

Saturday, October 11
11:30 AM—2:00 PM

AUDIO PROCESSING FOR BROADCAST

Moderator: *Joe Capobianco,* Cross-Country Communications

Panelists: *Marvin Caesar,* Aphex;
Mike Dorrough, Dorrough
Frank Foti, Omnia Audio;
Rocky Graham, Dolby
Leonard Kahn, Kahn Communications;
Thomas Lund, TC Electronics;
Robert Reams, Neural Audio;
David Reaves, Translantech

Once audio is mastered and sent to the broadcaster, passes thru various audio processors, affecting the presentation of the product. This event will feature discussion by leaders and pioneers of broadcast audio processing on compression, expansion, equalization curves and psychoacoustics.

SATURDAY

Saturday, October 11
12:30 PM—2:00 PM

PLATINUM PRODUCERS

How has the art of music recording changed over the past four decades? What is the state of the art today, and where is recording going? Join us for a lively, fascinating discussion as some of the world's top record producers talk about how far we've come and get out their crystal ball for a glimpse into the future.

Saturday, October 11
4:00 PM—6:00 PM

SPARS BUSINESS PANEL

Moderator: *TBA*

Panelists: *TBA*

The Society of Professional Audio Recording Services (SPARS) is a twenty-four-year-old professional organization dedicated to sharing practical, hands-on business information about audio facility ownership, management, and operations.This event, which is co-hosted by the AES, features an elite panel of studio owners and managers who will explore strategies for adapting your business to changing times.

(Special Events continued on page 4)

Saturday, October 11
6:40 PM—
8:30 PM

RICHARD C. HEYSER MEMORIAL LECTURE AND RECEPTION, FEATURING RAY KURZWEIL

The Richard C. Heyser Memorial Lecturer this time is Ray Kurzweil. His presentation will be followed by a Reception hosted by the AES Technical Council

Presentation Title:

"The Future of Music in the Age of Spiritual Machines."

Music is the only cultural expression common to every human society that we are aware of. Musical expression has always used the most advanced technologies available, from ancient drums, the cabinet-making crafts of the eighteenth century, the mechanical linkages of the nineteenth century, the analog electronics of the mid twentieth century, the digital technology of the 1980s and 1990s to the artificial intelligence coming in the twenty-first century. Communication bandwidths, the shrinking size of technology, our knowledge of the human brain, and human knowledge in general are all accelerating. Kurzweil's keynote will illustrate how the concepts and process of music will be transformed once again.

Sunday, October 12
12:00 NOON—
2:30 PM

DIGITAL BROADCASTING IN THE UNITED STATES

Moderator: *David K. Bialik,* Systems Engineering Consultant

Panelists: *Leonard Kahn,* Kahn Communications; *Mark Kalman,* Sirius; *David Layer,* NAB; *Tony Masiello,* XM; *Dr. H. Donald Messer,* International Broadcast Bureau—Voice of America, Digital Radio Mondiale; *Robert Reams,* Neural Audio ; *Dave Wilson,* CEA

The arrival of Digital Television, Satellite Radio, and In Band On Channel (IBOC) in the United States has made a reality of Digital Broadcasting. Many consumers and broadcasters are migrating to the new technologies, and the AES NY convention has been presenting the facts on the digital broadcast revolution for more than a decade.

This year's event will feature a look at Radio Mondiale as the next step to creating a digital shortwave service, a review of Codec technology, and a discussion of the availability of receivers for consumer consumption.

SUNDAY

Sunday, October 12
12:30 PM—
2:00 PM

PLATINUM ENGINEERS

We've gathered some of today's hottest engineers together; join as they discuss the tricks, techniques, mindset, and technologies that allow them to carry out their role—and how you can apply this information to your own situation.

Sunday, October 12
3:00 PM—
6:00 PM

SOUND SYSTEMS AND HUMAN HEARING—HOW TO MAXIMIZE SYSTEM PERFORMANCE FOR THE REAL WORLD

Moderator: *Frederick Ampel,* President & Principal Technology Visions, Overland Park, KS (Opening remarks and session overview theme)

Panelists: *Jeanne Stiernberg,* Principal Stiernberg Consulting, Los Angeles, CA (Audiological issues overview); *Matthew. Bakke,* Gallaudet University, Washington,D.C. (Audiology Segment); *Ted Uzzle,* Columbia College, Chicago. IL (Room Acoustics/Noise and Intelligibility); *Peter Mapp,* Peter Mapp & Associates, Essex, UK (Speech Intelligibility issues and measurement); *Durand Begault,* NASA/Ames Research Center, Moffett Field, CA (Hearing, Perception and understanding)

Understanding how the human ear hears a sound system, and the kinds of limitations and damage that exist within the listening population is not often considered in current sound system tuning and optimization practice.

This first ever presentation/workshop supported by data from the House Ear Institute and presented by a panel of world recognized experts including Audiology and hearing disabilities authority Jeanne Stiernberg and Frederick Ampel who has more than 3.5 decades of sound systems experience, will define and discuss the knowledge available to take advantage of how the ear perceives sound and compensate for the actual hearing and perceptive capabilities of real populations.

Sunday, October 12
6:30 PM—
7:15 PM

CENTRAL SYNAGOGUE TOUR

This tour will be followed by an ORGAN CONCERT by Graham Blyth.

Sunday, October 12
7:30 PM—
8:30 PM

ORGAN CONCERT BY GRAHAM BLYTH

This concert will be given in the Central Synagogue, following the tour.

Monday, October 13
10:30 AM—
12:00 NOON

TEMPLES OF SOUND

All great music has a birthplace. "Temples of Sound" tells the stories of the legendary studios where musical genius and a magical space came together to capture some of the most exciting records ever made. Authors Jim Cogan and William Clark will be our guide.

Monday, October 13
12:30 PM—
2:00 PM

ROAD WARRIORS: LIVE SOUND

This freewheeling panel of touring professionals will cover the latest trends, techniques, and tools that shape modern sound reinforcement. The all-star panel will cover subjects ranging from gear to gossip, in what promises to be an entertaining and educational 90 minutes, with the engineers on the business side of the microphone, saying something besides "testing" and "check" for a change!

Monday, October 13
2:30 PM—
4:00 PM

ROAD WARRIORS: LIVE RECORDING TIPS AND TECHNIQUES

Moderator: *Randy Ezratty,* Effanel Music, New York

Panelists: *John Alagia, Guy Charboneau, Dave Hewitt,* Remote Recording Services

Until recently, live multi-track recordings and broadcasts were the exclusive domain of a small, specialized group of "mobile recording studios". But as in every other segment of our industry, technological advances have created other viable (and some dubious) methods for capturing live performances.

This workshop will highlight the pros and cons of traditional and burgeoning methodologies (along with a few real-world "war stories" from the road).

MONDAY

Friday, October 10 9:00 AM—11:30 AM

TS-1: MICROPHONE TECHNIQUES FOR STEREO AND SURROUND

Chair: *Geoff Martin,* Bang & Olufsen A/S, Struer, Denmark

How have the demands of surround sound affected microphone techniques? This seminar will explore the way that microphones can be used to enhance surround sound mixing.

Friday, October 10 1:00 PM—3:30 PM

TS-2: THE BASICS OF DIGITAL AUDIO: A SEMINAR WITH DEMONSTRATIONS

Presenters: *Stanley P. Lipschitz, John Vanderkooy*, University of Waterloo, Canada

This is an introductory-level seminar aiming to explain and demonstrate with "live" examples the two fundamental aspects of any digital audio system—sampling and quantization. These two operations will be discussed and illustrated in real-time using a custom-built sampler and quantizer. This will enable us to present some of the pathologies of such systems, which should not normally be audible, and also show that, when properly implemented, a digital system has analog characteristics. This will make the presentation interesting to newcomers and "old pros" alike.

Friday, October 10 3:30 PM—5:00 PM

TS-3: POWERED LOUDSPEAKERS

Chair: *John Meyer*, Meyer Sound Laboratories, Inc., Berkeley, CA, USA

The use of self-amplified loudspeakers has dominated the designs of studio monitors. More recently a large number of both small and large format powered loudspeakers have been designed to serve live reinforcement applications. These speakers vary from inexpensive plastic boxes to high tech, systems with networkable DSP on-board.
This seminar will explore the advantages and design and use implications of self-powered loudspeakers.

Friday, October 10 5:00 PM—6:30 PM

TS-4: GROUNDING AND SHIELDING

Chair: *Bill Witlock*, Jensen Transformers, Van Nuys, CA, USA

Grounding and shielding techniques, at both the equipment and system level, have profound effects on immunity to interference. High-performance professional audio systems routinely encounter interference ranging in frequency from 50/60 Hz utility-power up to several GHz. A tutorial overview will explain basic interference coupling mechanisms as well as widely used grounding and shielding strategies.

Expert panelists will discuss tradeoffs involved in these strategies, results of various equipment and cable tests, and recommendations for equipment and system designers. A question and answer session will follow.

Saturday, October 11 9:00 AM—11:30 AM

TS-5: SURROUND SOUND MIXING—TIPS AND TECHNIQUES, A WORK IN PROGRESS

Chair: *Randy Ezratty*, Effanel Music, Inc., New York, NY, USA

Panelists: *Kevin Killen*, Independent Engineer/Producer; *Bob Ludwig*, Gateway Mastering & DVD, Portland, ME, USA; *Elliot Scheiner*, Independent Engineer/Producer

Mixing for surround, both in the studio and for live broadcast, presents many challenges and creative opportunities.

This seminar addresses the surround mixing process—technically and philosophically. Topics to be addressed include: The overall soundscape, the role of the sub-woofer, surround panning, effects in surround, and the unique requirements for broadcast.

Saturday, October 11 11:30 AM—1:30 PM

TS-6: ALL ABOUT: A/D CONVERTERS

Chair: *Dan Lavry*, Lavry Engineering, Seattle, WA, USA

Panelists: *Robert Adams*, Analog Devices; *Richard Cabot*, XFRM Inc.; *David Smith*, Sony Music Studios, NYC, USA

This tutorial workshop will review the key issues regarding the design and use of A/D converters. Almost no other type of gear garners more discussion and impassioned loyalty than these devices. Topics to be addressed: What gives an A/D converter its sound? How does converter architecture, clocks, jitter and bits impact sound? What are the issues beyond the generic specification sheet?

Saturday, October 11 2:00 PM—3:30 PM

TS-7: ALL ABOUT: COMPRESSORS

Compressors are commonly used in all aspects of the audio signal chain, in live performances, broadcast and in the studio.

This seminar is designed to explain how compressors work, where and how they can best be used, as well as discussing recent developments in compressor design, including the role of side chain analysis and multi-band compressors.

Saturday, October 11 3:30 PM—5:00 PM

TS-8: ALL ABOUT: MICROPHONE PREAMPLIFIERS

Presenters: *Eric Blackmere*, Earthworks; *John Lagrou*, Millenia, Placerville, CA, USA

Microphone preamplifiers have become a critical component in both the live and recording worlds. Few audio products have a wider cost spread with such similar specifications.

This seminar addresses the key issues in microphone preamplifier design, selection and use. Issues to be reviewed are: The use of transformers, amount of gain, self-noise, impedance, distortion and perceived sonic differences.

Saturday, October 11 5:00 PM—6:30 PM

TS-9: ALL ABOUT: EQUALIZERS

Presenters: *Dennis Bohn*, Rane Corp., Mukilteo, WA, USA; *Bruce Jackson*, *Don Pearson*, Ultra Sound-Pro Media, San Rafael, CA, USA

Equalizers are perhaps the most commonly used tools in recording, broadcast and live audio. This seminar will review the key issues of: design, configuration, digital vs. analog, parametric & graphic and real-world use of equalizers.

Sunday, October 12 9:00 AM—11:00 AM

TS-10 AUDIO NETWORKS

Chair: *Deb Britton*, Peak Audio, Halifax, Nova Scotia, Canada

The ability to move digital audio from one place to another via networks has taken several forms. Audio Networks now connect the live mixing consoles with the stage, inter-connect studios, distribute audio and control signals around large facilities and move audio across the Internet. Being part of the computer revolution, this technology is always in flux.

This seminar is designed to explore how this technology works and where it is headed.

(continued on page 6)

Sunday, October 12, 11:00 AM—12:30 PM

TS-11: SYSTEM OPTIMIZATION

Chair: *Michael Goodman*, Centrance Inc, Morton Grove, IL

Most sound systems are not well optimized. While this is commonly regarded as true, just what is an optimized system? System optimization involves setting up a system to make sure that a system has 'optimum' interaction with both itself and its acoustical environment. In recent years a number of new tools have become available for helping engineers optimize system performance.

This workshop will review the concept of system optimization and what areas of a system can be optimized once installed and which require alteration of the system or acoustical environment.

Sunday, October 12, 1:30 PM—3:00 PM

TS-12: ALL ABOUT: FIREWIRE & USB

Chair: *Michael Goodman*

Firewire and USB connections are two of the most commonly used ways to connect audio interfaces and storage devices to a computer. USB has recently been upgraded to 2.0 while Firewire has become increasingly common on all types of personal computers. This seminar will review the capabilities, limitations and advances of these two standards.

Sunday, October 12, 3:00 PM—4:30 PM

TS-13: ALL ABOUT: PERSONAL STAGE MONITORING

Chair: *Marty Garcia*, Futuresonics, Pineville, PA, USA

Personal stage monitoring has become a staple of both broadcast and live sound. This seminar will review the key issues in how the performance of personal stage monitors is defined and how these units can best be used.

Sunday, October 12, 4:30 PM—6:30 PM

TS-14: RIGGING FOR DUMMIES

Hanging equipment above performers and audiences is extremely commonplace. However, most audio engineers are not familiar with the basic principles of safe rigging. This seminar will introduce these principles, and review safety practices.

Monday, October 13, 9:00AM—10:30 AM

TS-15: ALL ABOUT: TIME DOMAIN MEASUREMENTS

Presenter: *Sam Berkow*, SIA Acoustics/WSDG, NYC, NY, USA

Most audio measurements are made in the frequency domain. However in many cases, making time domain measurements can be very informative in ways that frequency domain measurements are not. Time domain measurements can be critical in applications ranging from loudspeaker alignment to measurements of room acoustics. This seminar will focus on the value of time domain measurements.

Monday, October 13, 10:30 AM—12:30 PM

TS-16: WORKING WITH MICROPHONES—A PRACTICAL REVIEW

Presenter: *Ron Streicher*, Pacific AV Enterprises, Pasadena, CA, USA

The focus of this seminar will be a hands-on demonstration of many of the practical aspects of using microphones: mounting hardware, shock isolation, pop screens, cables, powering systems, etc. Techniques for rigging or "flying" microphones and arrays also will be presented. What will not be discussed is how or where to put a microphone for the best pickup of [insert your favorite instrument here.] That is an entirely different tutorial session. However, once you've chosen the microphone and its location, if you want to know how to get the microphone into that position most effectively and obtain optimum performance—free from intrusive mechanical noises, wind pops or blasts—this seminar is for you.

Monday, October 13 1:30 PM—6:00 PM

TS-17: LISTENING TESTS IN PRACTICE

Chair: *Nick Zacharov*, Nokia Research Center, Audio-Visual Systems Laboratory, Tampere, Finland

Panelists: *Søren Bech*, Bang and Olufsen a/s, Struer, Denmark; *Durand Begault*, NASA Ames Research Center, Mountain View, CA, USA; *William L. Martens*, McGill University, Montreal, Canada; *Sean Olive*, Harman International Industries, Inc., Martinsville, IN, USA; *Gilbert Soulodre*, Communications Research Centre, Ottawa, Ontario, Canada; *Thomas Sporer*, Fraunhofer IIS/AEMT, Ilmenau, Germany

This workshop presents a short but effective guide to preparing, performing and analyzing data for listening tests. The first part of the workshop will provide a general overview of experimental design methods that are generically applicable to all types of listening tests. The second part of the workshop will specifically consider three main types of listening test categories, providing examples of how they are correctly performed/analyzed and what is their scope of applicability.

HISTORICAL EXHIBIT

VINYL GOES DIGITAL

Friday, October 10 12:00 noon - 6:00 pm

Saturday, October 11 10:00 am - 6:00 pm

Sunday, October 12 10:00 am - 6:00 pm

Monday, October 13 10:00 am - 4:00 pm

The exhibit will feature nuts-and-bolts, hands-on living history that will graphically and sonically trace the tricky transition from vinyl biscuits to binary bits. During the four days some of the movers and shakers who nursed that revolution will be on hand. They will explain and demonstrate some of the vintage gear that sliced and diced analog waveforms into byte-sized pieces that computers could digest and sort out. Top recording engineers and record producers will play back master Recordings and talk about how they were created.

NEW EXHIBITOR SEMINARS

These will be presentations by Exhibitors at the 115th convention giving more in-depth information about their products than they are able to give on their booth. It is a unique opportunity for exhibitors to be able to explain the technical background and features of a product to an audience in a seminar style.

Exhibitor Seminars were first held at the AES 114th convention in Amsterdam earlier this year and were a tremendous success and so we expect them to be very popular in New York. Many exhibitors have already asked to be included in this program of seminars and a full listing will be published soon at www.aes.org.

FRIDAY

Friday, October 10
9:00 AM—11:00 AM

W1: DIGITAL AUDIO WORKSTATIONS

Chair: *David Malecpour,* Pro Audio Design, Boston, MA, USA

Panelists: Chris Athens, Sterling Sound, NYC, USA

The Digital Audio Workstation has become the centerpiece of many recording studios, acting as recorder, mixer, editor, router, effects rack and even a host of virtual instruments. The way that DAWs are used in studios is currently evolving at an extremely rapid pace. This workshop will explore the configuration of the DAW and how it fits into the studio and even live environments.

Friday, October 10
1:00 PM—4:00 PM

W2: HIGH RESOLUTION AUDIO—DEAD OR ALIVE?

Chair: *Alan Silverman,* Arf! Digital

Panelists: *David Chesky,* Chesky Records*; Malcolm Hawksford*

Practicing audio engineers are faced with a dizzying array of competing present and future high-resolution formats. The dilemma is now compounded by the question of whether high-res audio is even relevant to the general consumer. This ambitious and forward-looking workshop will present new developments and strategies driving technologies such as SACD, DVD-A, Blue Ray DVD, and broadband streaming along TCP/IP networks.

The workshop is intended to be of vital interest to working engineers, studio owners, broadcasters and educators with an interest in the future possibilities of high-resolution audio.

Friday, October 10
4:00 PM—6:30 PM

W3: AUDIO FOR GAMES

Chair: *Martin Wilde,* Motorola, Inc.

Games have long been a staple of the PC computer world. Once exhibiting only paltry audio support, modern computers and native gaming platforms now sport very high quality audio specifications and capabilities. With the advent of multichannel games, these systems are increasingly being hooked up to home theater systems. On the development side, there is increasing pressure to ship game titles on all the major platforms simultaneously, and gaming on the Internet has exploded. In the midst of all this change, it has become an increasingly important and difficult challenge to handle the audio across all of these different channels. This workshop delivers the goods on all of these issues, and more.

Attendees who are registered for exhibits can attend individual workshops by paying a $35 fee at the Educational Desk.

SATURDAY

Saturday, October 11
9:00 AM—11:00 AM

W4: DESIGN OF TECHNICAL SYSTEMS FOR SPORTS FACILITIES

Chair: *Jack Wrightson*, WJHW

Panelists: *Dan Abelson*, IGS, Inc.; *Will Parry*, SPL; *Brad Ricks*, Harman Professional Systems

Production values of sports facilities have long been on the rise. Speech intelligibility is no longer the only requirement for most new sports facilities, where full impact music reproduction is also a large part of the production.

This workshop will address the various configurations of systems being used in sports facilities, the differences, between sports, logistical issues in dealing with such large facilities and operational issues.

Saturday, October 11
11:00 AM—1:00 PM

W5: SOUND FOR BROADWAY

Chair: *Scott Lehrer*

Panelists: *Tom Clark*, ACME; *Peter Fitzgerald*, Sound Associates*; Lou Meade*, Independent

Broadway sound systems are a unique blend of leading edge technology and old-school theatrical production values. From a large numbers of wireless microphones, to complex loudspeaker systems, to sometimes-difficult talent, designing for Broadway presents unique challenges. This workshop explores how some of Broadway's leading designers address this set of challenges.

Saturday, October 11
2:00 PM—4:30 PM

W6: AUTOMOTIVE AUDIO

Chair: *Richard S. Stroud,* Chairman AES Automotive Audio Technical Committee

Developers of automotive audio systems, both OEM designers and the aftermarket installers share the goal of customer satisfaction. Their customers want great sound and, in the aftermarket, the restrictions of cost and space are somewhat modified. Additionally, the expectations of power and bass are magnified. This workshop will give the AES's OEM-heavy audience a look at opportunities and challenges in the world of aftermarket automotive audio.

Saturday, October 11
4:30 PM—6:30 PM

W7: LINE ARRAYS

Chair: *Dave Gunness, EAW*

Panelists: *Mark Engenbretson*, JBL

The use of line arrays, long a part of sound reinforcement, has become the dominant configuration of concert loudspeaker cluster designs. In the past years, improvements in rigging, DSP control, self powered units and understanding of usage, all have lead to further improvements in line arrays. This workshop will review the state of the art in line array technology.

SUNDAY

Sunday, October 12
9:00 AM—11:00 AM

W8: INTERACTIVE IMMERSIVE SONIC SCENES: MPEG-4 AUDIOBIFS MODELS & STRUCTURED AUDIO IN REAL-WORLD APPLICATIONS

Chair: *Giorgio Zoia*, EPFL, Switzerland

Panelists: *Kevin Larke*, Kodiran Inc., USA; *Jan Plogsties*, Fraunhofer Institute, Germany; *Schuyler Quackenbush*, Audio Research Labs, USA; *Juergen Schmidt*, Thomson, Germany

With the definition of the MPEG-4 Audio and Systems standards, a comprehensive and universal toolbox for representing audio content became available. Over time, more and more components of this standard have found their way into real-word applications, including general audio coding and scalable coding. This workshop illustrates how another layer of the MPEG-4 content representation is increasingly used to create attractive applications, in connection with other above mentioned components.

Sunday, October 12
11:00 AM—1:00 PM

W9: DVD AUTHORING

Chair: *Bob Ludwig*, Gateway Mastering, Portland, USA

DVD authoring is a new area, with ever changing set of rules and goals. Audio for DVDs comes in many flavors. This workshop is designed to explore the current state of DVD authoring, explaining what tools are available and what options they provide.

(continued on page 8)

Sunday, October 12
1:30 PM—3:30 PM

W10: MASTERING

Moderator: *Dave Glasser*, Airshow Mastering

Panelists: *Bob Ludwig*, Gateway Mastering & DVD; *Darcy Proper*, Sony Music Studios; *Andy VanDette*, Masterdisk; *Jonathan Wyner*, M-Works

Audio mastering encompasses a wide range of disciplines. A panel of veteran mastering engineers will discuss mastering for varied release formats including CD, DVD (V & A), SACD; surround mastering issues; preparing catalog and historical material for reissue; mastering studio workflow and technical infrastructure; and other topics.

Sunday, October 12
3:30 PM—6:30 PM

W11: PRACTICAL STUDIO DESIGN

Chair: *John Storyk*, WSDG

Whether in the basement of a home or a major multi-room complex, the design of studios should be done with an eye toward practicality. In this sense, being practical means, making best use of the space available, treatments selected and support facilities, such as power and HVAC systems. This workshop will review studio design and construction, with an eye toward practicality.

Monday, October 13
9:00 AM—10:30 AM

W12: AUDIO GETS SMART—THE WHAT AND WHY OF SEMANTIC AUDIO ANALYSIS

Chair: *Mark Sandler*, University of London, UK

Panelists: *Michael Casey, Dan Ellis, Juergen Herre*

In this workshop, three leading international experts will each offer a personal view of the technologies and opportunities brought to audio engineering by Semantic Audio Analysis.

The new Technical Committee of the AES has been established to represent this emerging area, and has as one of its initial aims, the goal of promoting SAA within the Audio Engineering community. In a strict sense, Semantic Audio Analysis means the extraction of features from audio (live or recorded) that have some human relevance—rhythm, notes, phrases, or have some physical correlate—instrument, moving vehicle, singing bird. The workshop will highlight examples where SAA can supplement all our interactions with music and audio to provide new work and recreational experiences.

MONDAY

Monday, October 13,
10:30 AM—12:30 PM

W13: SPEECH INTELLIGIBILITY

Chair: *Peter Mapp*, Peter Mapp Associates, Colchester, UK

Speech intelligibility is a key requirement of most installed sound systems. Attempts to predict and measure speech intelligibility require an understanding of loudspeaker directionality, room acoustics and human hearing. This workshop will explore the many tools and methods available to help both system designers and operators to achieve this critical performance goal.

Monday, October 13,
1:30 PM—3:00 PM

W14: SURROUND FROM STEREO

Chair: *David Griesinger*, Lexicon

In both the home theater and cars, two channel recordings are being processed to create surround outputs. How does this process work, and are the results effective? This workshop will look at this technology, both to explain the process and review its place in the current market place.

STUDENT PROGRAMS

The AES Convention provides student members around the world with an opportunity to meet and share experiences related to education in the field of audio.

Friday, October 10
6:00 PM—7:00 PM

STUDENT DELEGATE ASSEMBLY MEETING 1

Chair: *Dell Harris*

Vice-Chair: *Scott Cannon*

Current student officers will preside over the first Student Delegate Assembly, of interest to all students and educators attending the convention. A descriptive overview of conference events for students will be given, including the availability and sign up procedures for Mentoring Sessions with industry leaders. This opening meeting of the SDA will also introduce the candidates for chair and vice chair of the North/South America Regions for the coming year. Election results will be announced at the second Student Delegate Assembly on Monday, October 13, at 12:30 pm.

Saturday, October 11
10:00 AM—11:30 AM

STUDENT POSTER SESSION & DESIGN COMPETITION

The event will display the scholarly/research/creative works from AES student members. Since many institutions are engaged in both research and applied sciences of audio, this session will provide an opportunity to display and discuss these accomplishments with professionals, educators, and other students. For the first time, a new Design Project Competition will be introduced for projects made by any current AES student member. Details can be found at www.aes.org/students/.

Saturday, October 11
2:00 PM—4:00 PM

ONE ON ONE MENTORING SESSION—1

Students are invited to sign-up for an individual meeting with distinguished mentors from the audio industry. Signups can be found near the student area of the convention, and all students are invited to participate in this exciting and rewarding opportunity for focused discussion.

Sunday, October 12
10:30 AM—12:00 NOON

EDUCATION FAIR

Institutions offering studies in audio—from short courses to graduate degrees—will be represented in a "tabletop session." Information on each school's respective programs will be made available through the display of literature and academic guidance sessions with representatives. There is no charge for schools to participate and admission is free and open to everyone.

Sunday, October 12
2:00 PM—4:00 PM

ONE ON ONE MENTORING SESSION—2

Students are invited to sign-up for an individual meeting with distinguished mentors from the audio industry. Signups can be found near the student area of the convention, and all students are invited to participate in this exciting and rewarding opportunity for focused discussion.

Sunday, October 12
2:30 PM—6:30 PM

STUDENT RECORDING COMPETITION

Co-Hosts: *Don Puluse*; *William Moylan*, University of Massachusetts, Lowell

Finalists selected by an elite panel of judges will give brief descriptions and play recordings in the Classical and Jazz/Pop categories. One submission per school per category. Details can be found on the AES Students Website. Meritorious awards will be presented at the Student Delegate Assembly 2 meeting.

2:30 pm—3:30 pm Classical Category

3:30 pm—4:30 pm Surround Classical Category

4:30 pm—5:00 pm Jazz/Folk Category

5:00 pm—6:00 pm Pop/Rock Category

6:00 pm—6:30 pm Surround Non-Classical Category

Judges to be announced.

Monday, October 13
10:00 AM—12:00 NOON

EDUCATION FORUM

Co-Hosts: *Don Puluse*; *William Moylan*, University of Massachusetts, Lowell

This event is a meeting of the AES Education Committee, teachers, authors, students, and AES members interested in the issues of primary and continuing audio education. It is an opportunity to discuss the programs of the Education Committee and to provide input for future projects.

Monday, October 13
10:00 AM—12:00 NOON

ONE ON ONE MENTORING SESSION—3

Students are invited to sign-up for an individual meeting with distinguished mentors from the audio industry. Signups can be found near the student area of the convention, and all students are invited to participate in this exciting and rewarding opportunity for focused discussion.

Monday, October 13
12:30 PM—1:30 PM

STUDENT DELEGATE ASSEMBLY MEETING—2

Chair: *Dell Harris*

Vice-Chair: *Scott Cannon*

At this meeting the SDA will elect new officers. One vote will be cast by the designated representative from each recognized AES student section in the North/South America Regions. Judges' comments and awards will be presented for the Recording Competitions and the Student Poster/Project Design Sessions. Plans for future student activities at local, regional, and international levels will be summarized.

Enhance your education and expand your networking opportunities as a 115th Convention Student Volunteer. For more details and to participate, please visit the AES website at www.aes.org or contact us at 115th_studentvolunteers@aes.org

Friday, October 10
9:00 AM—11:30 AM

SESSION A: AUDIO FOR GAMES
(INVITED PAPERS)

Chair: *Martin Wilde*, Wildeworks, Chicago, IL, USA

A-1: Interoperable Synthetic Audio Formats for Mobile Applications and Games—*Matti Hämäläinen,* Nokia Research Center, Tampere, Finland

A-2: Preview: Interactive XMF—A Standardized Interchange File Format for Advanced Interactive Audio Content—*Chris Grigg,* MIDI Manufacturers Association, Los Angeles, CA, USA; Beatnik Inc., San Mateo, CA, USA; Control-G, Oakland, CA, USA

A-3: Computer Games and Multichannel Audio Quality—The Effect of Division of Attention between Auditory and Visual Modalities, Part II—*Rafael Kassier, Slawomir Zielinski, Francis Rumsey,* University of Surrey, Guildford, Surrey, UK; *Soren Bech,* Bang & Olufsen a/s, Struer, Denmark

A-4: Towards Mix Level Standardization for Games—*Tom Hays*, Treyarch Games

A-5: Interactive Mixing of Game Audio—*Brian Schmidt,* Microsoft Corporation, Redmond, WA, USA

FRIDAY

Friday, October 10
10:00 AM—11:30 AM

SESSION Z1: POSTERS:
ACOUSTICS AND SOUND REPRODUCTION

Z1-1: Wavelet-Based Multiple Point Equalization of Room Transfer Function—*Jae-Jin Jeon, Lae-Hoon Kim, Koeng-Mo Sung,* Seoul National University, Seoul, Korea

Z1-2: The Time When the Reverberation Tail in a Binaural Room Impulse Response Begins—*Kittiphong Meesawat, Dorte Hammershøi,* Aalborg University, Aalborg, Denmark

Z1-3: Hybrid M Sequences for Room Impulse Response Estimation—*Joel Preto Paulo, Carlos Rodrigues Martins,* Escola Náutica Infante D. Henrique, Paço D'Arcos, Oeiras, Portugal; *José L. Bento Coelho*, Instituto Superior Técnico, Lisbon, Portugal

Z1-4: Active Field Control (AFC)—Reverberation Enhancement System Using Acoustical Feedback Control—*Hideo Miyazaki, Takayuki Watanabe, Shinji Kishinaga, Fukushi Kawakami,* Yamaha Corporation, Hamamatsu, Shizuoka, Japan

Z1-5: Designing a Spherical Microphone Array for the Directional Analysis of Reflections and Reverberation—*Bradford N. Gover,* National Research Council, Ottawa, Ontario, Canada; *James G. Ryan*, Gennum Corporation, Kanata, Ontario, Canada; *Michael R. Stinson*, National Research Council, Ottawa, Ontario, Canada

Z1-6: Practical Implementation of Constant Beamwidth Transducer (CBT) Loudspeaker Circular-Arc Line Arrays—*D. B. (Don) Keele, Jr.,* Harman/Becker Automotive Systems, Martinsville, IN, USA

Z1-7: Acoustical Evaluation of Virtual Rooms by Means of Binaural Activity Patterns—*Wolfgang Hess,* Ruhr-Univeristy Bochum, Bochum, Germany; Harman/Becker Automotive Systems, Ittersbach, Germany; *Jonas Braasch, Jens Blauert,* Ruhr-University, Bochum, Bochum, Germany

Please note: The final order for presentation of papers may vary slightly from this preliminary schedule.

Friday, October 10
2:00 PM—4:00 PM

SESSION B: LOUDSPEAKERS, PART 1

Chair: *Juha Backman*, Nokia Mobile Phones, Espoo, Finland; HUT, Espoo, Finland

B-1: An Acoustical Measurement Method for the Derivation of Loudspeaker Parameters—*Brian E. Anderson, Timothy W. Leishman,* Brigham Young University, Provo, UT, USA

B-2: The Active Pulse-Modulated Transducer (APT)—A Novel Audio Power Conversion System Architecture—*Karsten Nielsen, Lars Michael Fenger,* Bang & Olufsen ICEpower a/s, Copenhagen, Denmark

B-3: **Implementation of a Wide-Bandwidth, Digitally Steered Array**—*Nathan Butler, David Gunness,* Eastern Acoustic Works, Inc., Whitinsville, MA, USA

B-4: **Low-Frequency Polar Pattern Control for Improved In-Room Response**—*Juha Backman,* Nokia Mobile Phones, Espoo, Finland; Helsinki University of Technology, Espoo, Finland

Friday, October 10 2:00 PM—4:30 PM

SESSION C: LOW BIT-RATE AUDIO CODING

Chair: *Jurgen Herre*, Fraunhofer IIS AEMT, Erlangen, Germany

C-1: **Scalable Perceptual and Lossless Audio Coding Based on MPEG-4 AAC**—*Ralf Geiger, Gerald Schuller,* Fraunhofer IIS AEMT, Ilmenau, Germany; *Jürgen Herre, Ralph Sperschneider,* Fraunhofer IIS AEMT, Erlangen, Germany; *Thomas Sporer,* Fraunhofer IIS AEMT, Ilmenau, Germany

C-2: **Robust MPEG Advanced Audio Coding Over Wireless Channels**—*T. H. Yeo*, National University of Singapore, Singapore; *W. C. Wong*, National University of Singapore, Singapore, Institute for Infocomm Research, Singapore; *Dong-Yan Huang,* Institute for Infocomm Research, Singapore

C-3: **MP3 in MPEG-4**—*Bernhard Grill, Harald Gernhardt, Michael Härtl, Johannes Hilpert, Manfred Lutzky, Martin Weishart*, Fraunhofer IIS, Erlangen, Germany

C-4: **A Closer Look into MPEG-4 High Efficiency AAC**—*Martin Wolters*, Coding Technologies, Nürnberg, Germany; *Kristofer Kjörling,* Coding Technologies, Stockholm, Sweden; *Daniel Homm*, Coding Technologies, Nürnberg, Germany; *Heiko Purnhagen*, Coding Technologies, Stockholm, Germany

C-5: **MPEG-4 Lossless Coding for High-Definition Audio**—*Tilman Liebchen*, Technical University of Berlin, Berlin, Germany

Friday, October 10 2:00 PM—3:30 PM

SESSION Z2: POSTERS: NETWORKING

Z2-1: **An mLAN Connection Management Server for Web-Based, Multi-User, Audio Device Patching**—*Jun-ichi Fujimori,* Yamaha Corporation, Hamamatsu Japan; *Richard Foss, Brad Klinkradt, Shaun Bangay*, Rhodes University, Grahamstown, South Africa

Z2-2: **The Audio File Format for Digital Distribution**—*Shigeru Aoki,* TokyoFM Broadcasting, Tokyo, Japan; *Hirokazu Nakashima,* TBS R&C, Tokyo, Japan

Z2-3: **Design Method of Digital Audio Network System for Auditoriums**—*Masahiro Ikeda, Shinjiro Yamashita, Shinji Kishinaga, Fukushi Kawakami,* Yamaha Corporation, Hamamatsu, Japan

Friday, October 10 4:00 PM—6:00 PM

SESSION D: HIGH-RESOLUTION AUDIO

Chair: *Malcom Hawksford*, University of Essex, UK

D-1: **Perceptual Discrimination between Musical Sounds With and Without Very High Frequency Components**—*Toshiyuki Nishiguchi, Kimio Hamasaki, Masakazu Iwaki, Akio Ando,* NHK Science & Technical Research Laboratories, Tokyo, Japan

D-2: **Parametrically Controlled Noise Shaping in Variable State-Step-Back Pseudo-Trellis SDM**—*Malcolm Hawksford,* University of Essex, Colchester, Essex, UK

D-3: **A Universal Interface on Cat-5 Cable for High-Resolution Multichannel Audio Interconnection**—*Michael Page, Gary Cook, Peter Eastty, Eamon Hughes, Mike Smith,* Sony Oxford, Eynsham, Oxford, UK

D-4: **The Effects and Reduction of Common-Mode Noise and Electromagnetic Interference in High-Resolution Digital Audio Transmission Systems**—*Jon Paul,* Scientific Conversion, Inc., Novato, CA, USA

Friday, October 10 3:30 PM—5:00 PM

SESSION Z3: POSTERS: LOUDSPEAKERS

Z3-1: **Adjusting A Loudspeaker to Its Acoustic Environment—The ABC System**—*Jan Abildgaard Pedersen*, Bang & Olufsen a/s, Struer, Denmark

Z3-2: **Lamps for Loudspeaker Protection**—*Scott Dorsey*, Kludge Audio, Williamsburg, VA, USA

Z3-3: **Hey Kid! Wanna Build a Loudspeaker? The First One's Free**—*Steven Garrett,* Penn State University, State College, PA, USA; *John F. Heake,* Naval Surface Warfare Center, Philadelphia, PA, USA

Z3-4: **Loose Particle Detection in Loudspeakers**—*Pascal Brunet,* Listen, Inc., Boston, MA, USA; *Evan Chakroff,* Tufts University, Medford, MA, USA; *Steve Temme*, Listen, Inc., Boston, MA, USA

Z3-5: **Radiation of Sound by a Baffled DML-Panel Near a Porous Layer**—*Elena Prokofieva*, University of Bradford, Bradford, UK

Z3-6: **Practical Application of Linear Phase Crossovers with Transition Bands Approaching a Brick Wall Response for Optimal Loudspeaker Frequency, Impulse, and Polar Response**—*Justin Baird, David McGrath*, Lake Technology, Sydney, New South Wales, Australia

Z3-7: **Practical Benefits and Limitations of Digitally Steered Arrays**—*William Hoy, David Gunness*, Eastern Acoustic Works, Inc., Whitinsville, MA, USA

Z3-8: **The Development of a Forward Radiating Compression Driver by the Application of Acoustic, Magnetic, and Thermal Finite Element Methods**—*Mark Dodd*, Celestion International Ltd. Ipswich, Suffolk, UK

Z3-9: **Comparison of Direct-Radiator Loudspeaker System Nominal Power Efficiency vs. True Efficiency with High-Bl Drivers**—*D. B. Keele, Jr.*, Harman/Becker Automotive Systems, Martinsville, IN, USA

Friday, October 10 4:30 PM—5:50 PM

SESSION E: MICROMACHINING (INVITED PAPERS)

Chair: *John Strawn*, S Systems, Larkspur, CA, USA

E-1: **MEMS (Microelectromechanical Systems) Audio Devices—Dreams and Realities**—*John J. Neumann, Jr.,* Carnegie Mellon University. Pittsburg, PA, USA

E-2: **Surface-Micromachined MEMS Microphone**—*Gary W. Elko,* Avaya Labs, Basking Ridge, NJ, USA; *Flavio Pardo, Daniel Lopez, David Bishop,* Bell Labs, Lucent Technologies, Muray Hill, NJ, USA; *Peter Gammel*, Agere Systems, Allentown, PA, USA

Saturday, October 11 9:00 AM—12:00 NOON

SESSION F: PSYCHOACOUSTICS, PERCEPTION, AND LISTENING TESTS, PART 1

Chair: *Nantanya Ford*, University of Surrey, UK

F-1: **Auditory Perception of Nonlinear Distortion—Theory**—*Earl R. Geddes,* GedLee LLC, Northville, MI, USA; *Lidia W. Lee*, GedLee LLC, Northville, MI, USA; Eastern Michigan University, Ypsilanti, MI, USA (Invited)

F-2: **Auditory Perception of Nonlinear Distortion**—*Lidia W. Lee,* Eastern Michigan University, Ypsilanti, MI, USA; *Earl Geddes,* GedLee LLC, Northville, MI, USA (Invited)

F-3: **The Subjective Loudness of Typical Program Material**—*Gilbert A. Soulodre, Michel C. Lavoie, Scott G. Norcross*, Communications Research Centre, Ottawa, Ontario, Canada

F-4: **A Calibrated Source for Virtual Audio Prototyping**—*Kalle Koivuniemi, Nick Zacharov,* Nokia Research Center, Tampere, Finland

F-5: **Augmentation, Application, and Verification of the Generalized Listener Selection Procedure**—*David Isherwood, Gaëtan Lorho, Ville-Veikko Mattila, Nick Zacharov*, Nokia Research Center, Tampere, Finland

F-6: **Relating Multilingual Semantic Scales to a Common Timbre Space: Part II**—*Charith N. W. Giragama*, University of Aizu, Aizu-Wakamatsu, Fukushima-ken, Japan; *William L. Martens*, McGill

SATURDAY

University, Montreal, Quebec, Canada; *Susanta Herath*, St. Cloud State University, St. Cloud, MN, USA; *Dishna R. Wanasinghe, Alam M. Sabbir*, University of Aizu, Aizu-Wakamatsu, Fukushima-ken, Japan

Saturday, October 11 9:00 AM—12:00 NOON

SESSION G: INSTRUMENTATION AND MEASUREMENT

Chair: *John Vanderkooy*, University of Waterloo, Ontario, Canada

G-1: **Objective Measures of Loudness**—*Gilbert A. Soulodre, Scott G. Norcross*, Communications Research Centre, Ottawa, Ontario, Canada

G-2: **Testing for Radio-Frequency Common Impedance Coupling (the "Pin 1 Problem") in Microphones and Other Audio Equipment**—*Jim Brown*, Audio Systems Group, Inc., Chicago, IL, USA

G-3: **A Novel Method of Testing for Susceptibility of Audio Equipment to Interference from Medium and High Frequency Radio Transmitters**—*Jim Brown*, Audio Systems Group, Inc., Chicago, IL, USA

G-4: **Directional Room Acoustics Measurement Using Large-Scale Microphone Arrays**—*Paul Henderson*, Rensselaer Polytechnic Institute, Troy, NY, USA

G-5: **Intelligent Program Loudness Measurement and Control:** What Satisfies Listeners?—*Jeffrey C. Riedmiller, Steve Lyman, Charles Robinson,* Dolby Laboratories, Inc., San Francisco, CA, USA

G-6: **A Novel Single-Microphone Method of Measuring Acoustical Impedance in a Tube**—*Robert Stevens,* HGC Engineering, Mississauga, Ontario, Canada; *John Vanderkooy*, University of Waterloo, Waterloo, Ontario, Canada

Saturday, October 11 2:00 PM—5:00 PM

SESSION H: PSYCHOACOUSTICS, PERCEPTION, AND LISTENING TESTS, PART 2

Chair: *Gilbert Soulodre*, Communications Research Centre, Ottawa, Canada

H-1: **Localization in an HRTF-Based Minimum Audible Angle Listening Test on a 2-D Sound Screen for GUIB Applications**—*György Wersényi,* Széchenyi István University, Győr, Hungary

H-2: **On the Twelve Basic Intervals in South Indian Classical Music**—*Arvindh Krishnaswamy*, Stanford University, Stanford, CA, USA

H-3: **A Pointing Technique with Visual Feedback for Sound Source Localization Experiments**—*Sylvain Choisel,* Aalborg University, Aalborg, Denmark; Bang & Olufsen A/S, Struer, Denmark; *Karin Zimmer,* Aalborg University, Aalborg, Denmark

H-4: **Difference Limen for Changes in Q Factor for Room Modes**—*Bruno Fazenda, Mark Avis, William Davies*, University of Salford, Salford, Manchester, UK

H-5: **The Effects of Early Decay Time on Auditory Depth in the Virtual Audio Environment**—*Jungmin Park, Han-gil Moon, Koeng-mo Sung,* Seoul National University, Seoul, Korea; *Dae-young Jang,* Electronics and Telecommunications Research Institute, Daejun, Korea

H-6: **Creating a Universal Graphical Assessment Language for Describing and Evaluating Spatial Attributes of Reproduced Audio Events**—*Natanya Ford, Francis Rumsey,* University of Surrey, Surrey, Guildford, UK; *Tim Nind,* Harman/Becker Automotive Systems, Bridgend, Wales, UK

Saturday, October 11 2:00 PM—4:30 PM

SESSION I: LOUDSPEAKERS: PART 2

Chair: *Wolfgang Klippel*, GmbH, Dresden, Germany

I-1: **A Virtual Loudspeaker Model to Enable Real-Time Listening Tests in Examining the Audibility of High-Order Crossover Networks**—*Brandon Cochenour, David Rich,* Lafayette College, Easton, PA, USA

I-2: **Tracking Changes In Linear Loudspeaker Parameters with Current Feedback**—*Andrew Bright,* Nokia Corporation, Helsinki, Finland

I-3: **Comparative Analysis of Moving-Coil Loudspeakers Driven by Voltage and Current Sources**—*Rosalfonso Bortoni, Sidnei Noceti Filho, Rui Seara,* Federal University of Santa Catarina, Florianópolis, Brazil

I-4: **Loudspeakers' Electric Models for Study of the Efforts in Audio Power Amplifiers**—*Rosalfonso Bortoni,* Studio R Electronics, São Paulo, Brazil; *Homero Sette Silva*, Selenium Loudspeakers, Nova Santa Rita, Brazil

I-5: **Nonlinear Versus Parametric Effects in Compression Drivers**—*Alexander Voishvillo,* Cerwinski Labs Inc., Simi Valley, CA, USA

I-6: **Measurement of Equivalent Harmonic Input Distortion**—*Wolfgang Klippel,* Klippel GmbH, Dresden, Germany

Saturday, October 11 2:00 PM—3:30 PM

SESSION Z4: POSTERS: SIGNAL PROCESSING, PART 1

Z4-1: **On Peak-Detecting and RMS Feedback and Feedforward Compressors**—*Jonathan Abel, David Berners*, Universal Audio, Inc., Santa Cruz, CA, USA

Z4-2: **Return Loss and Digital Audio**—*Stephen Lampen,* Belden Electronics Division, San Francisco, CA, USA

Z4-3: **A Generalization of the Biquadratic Parametric Equalizer**—*Knud Bank Christensen*, TC Electronic A/S, Risskov, Denmark

Z4-4: **A Review of Smart Acoustic Volume Controllers for Consumer Electronics**—*Suthikshn Kumar,* Larsen & Toubro Infotech Ltd., Bangalore, India

Z4-5: **Head Related Transfer Function Refinement Using Directional Weighting Function**—*Sin-lyul Lee, Lae-Hoon Kim, Koeng-Mo Sung,* Seoul National University, Seoul, Korea

Z4-6: **A Multibit Delta-Sigma DAC with Mismatch Shaping in the Feedback Loop**—*Bruce Duewer, John Melanson, Heling Yi, Steve Green,* Cirrus Logic, Inc., Austin, TX, USA

Z4-7: **An Efficient Low-Power Audio Amplifier with Power Supply Rails Tracking the Output by Means of Pulse Width Modulation**—*Robert Peruzzi, Marvin White*, Lehigh University, Bethlehem, PA, USA; *David Rich*, Lafeyette College, Easton, PA, USA

Z4-8: **A Unified Approach to Low- and High-Frequency Bandwidth Extension**—*Ronald Aarts,* Philips Research Labs, Eindhoven, The Netherlands; *Erik Larsen*, University of Illinois at Urbana-Champaign, Urbana, IL, USA; *Okke Ouweltjes*, Philips Research Labs, Eindhoven, The Netherlands

Saturday, October 11 4:00 PM—5:30 PM

SESSION Z5: POSTERS: SIGNAL PROCESSING, PART 2

Z5-1: **Embedded Digital Filters for PWM Generators**—*Alberto Bellini,* University of Parma, Parma, Italy

Z5-2: **Further Investigations of Inverse Filtering**—*Scott G. Norcross, Gilbert A. Soulodre, Michel C. Lavoie,* Communications Research Centre, Ottawa, Ontario, Canada

Z5-3: **Pure Linear Prediction**—*Albertus den Brinker, Felip Riera-Palou,* Philips Research, Eindhoven, The Netherlands

Z5-4: **Design of Low-Order Filters for Radiation Synthesis**—*Peter Kassakian, David Wessel,* University of California, Berkeley, Berkeley, CA, USA

Z5-5: **A Numerical Method to Modify the NBR 10303 Filter Frequency Response**—*André Dalcastagnê, Sidnei Noceti Filho,* Universidade Federal University of Santa Catarina, Florianópolis, Brazil; *Homero Sette Silva,* Eletrônica Selenium S.A., Nova Santa Rita, Brazil

Z5-6: **Time Delay Spectrometry Processing Using Standard Hardware Platforms**—*Wolfgang Ahnert,* ADA Acoustic Design Ahnert, Berlin, Germany; *Stefan Feistel,* SDA Software Design Ahnert GmbH, Berlin, Germany; *Steven McManus,* Gold Line Connector Inc., New Bedford, MA, USA; *Waldemar Richert,* SDA Software Design Ahnert GmbH, Berlin, Germany

Z5-7: **Lossless Signal Processing with Complex Mersenne Transforms**—*James Angus, Tim Jackson*, University of Salford, Salford, UK

SUNDAY

Sunday, October 12
9:00 AM—12:00 NOON

SESSION J: MULTICHANNEL AUDIO

Chair: *Geoff Martin*, Bang & Olfusen, Struer, Denmark

J-1: **An Approach to Miking and Mixing of Music Ensembles Using Wave Field Synthesis**—*Clemens Kuhn,* Duesseldorf Conservatory of Music and University of Applied Sciences, Duesseldorf, Germany; *Renato Pellegrini,* sonicEmotion AG, Zurich, Switzerland; *Dieter Leckschat,* Duesseldorf University of Applied Sciences, Düsseldorf, Germany; *Etienne Corteel,* IRCAM, Paris, France

J-2: **Investigation of Interactions between Recording/Mixing Parameters and Spatial Subjective Attributes in the Frame of 5.1 Multichannel**—*Magali Deschamps,* Conservatoire National Supérieur de Musique de Paris, Paris, France; *Olivier Warusfel, Alexis Baskind,* IRCAM, Paris, France

J-3: **Some Considerations for High-Resolution Audio**—*Wieslaw Woszczyk,* McGill University, Montreal, Quebec, Canada

J-4: **Virtual Acoustic System with a Multichannel Headphone**—*Ingyu Chun, Philip Nelson,* University of Southampton, Southampton, UK

J-5: **Perceptually Motivated Processing for Spatial Audio Microphone Arrays**—*Christoph Reller, Malcolm O. J. Hawksford,* University of Essex, Essex, UK

J-6: **Scalable Tri-Play Recording for Stereo, ITU 5.1/6.1 2-D, and Periphonic 3-D (with Height) Compatible Surround Sound Reproduction**—*Robert (Robin) Miller III,* Filmaker Technology, Bethlehem, PA, USA

Sunday, October 12
9:00 AM—12:00 NOON

SESSION K: SIGNAL PROCESSING FOR AUDIO, PART 1

Chair: *Rob Maher*, Montana State University, Bozman, MT, USA

K-1: **Dither and Noise Modulation in Sigma Delta Modulators**—*Joshua Reiss, Mark Sandler,* Queen Mary, University of London, London, UK

K-2: **Stability Analysis of Limit Cycles in High Order Sigma Delta Modulators**—*Derk Reefman,* Philips Research, Eindhoven, The Netherlands; *Joshua Reiss,* Queen Mary, University of London, London, UK; *Erwin Janssen,* Philips Research, Eindhoven, The Netherlands; *Mark Sandler,* Queen Mary, University of London, London, UK

K-3: **Compression and Decompression of Wavetable Synthesis Data**—*Rob Maher,* Montana State University, Bozeman, MT, USA

K-4: **Reconfigurable Logic for Audio Signal Processing**—*Helen Tarn, Chris Dick,* Xilinx, Inc., San Jose, CA, USA

K-5: **Discrete-Time Shelf Filter Design for Analog Modeling**—*David P. Berners, Jonathan S. Abel,* Universal Audio, Inc., Santa Cruz, CA, USA

K-6: **High-Performance Configurable Fixed-Point Audio Processor Development**—*Srikanth Gurrapu, Doug Roberson,* Texas Instruments, Inc., Dallas, TX, USA

Sunday, October 12
2:00 PM—5:00 PM

SESSION L: ROOM ACOUSTICS

Chair: *Eddy Bogh Brixen*, EBB Consult, Smorum, Denmark

L-1: **Sensitivity of Multichannel Room Equalization to Listener Position**—*Sunil Bharitkar, Philip Hilmes, Chris Kyriakakis,* University of Southern California, Los Angeles, CA, USA

L-2: **In-Room Low Frequency Optimization**—*Todd Welti, Allan Devantier,* Harman International Industries, Northridge, CA, USA

L-3: **Hybrid Equalization of a Room for a Home Theater System**—*Lae-Hoon Kim, Jae-Jin Jeon, Sin-lyul Lee, Koeng-Mo Sung,* Seoul National University, Seoul, Korea

L-4: **Low Frequency Absorbers—Applications and Comparisons**—*Dirk Noy, Gabriel Hauser,* Walters-Storyk Design Group Europe, Liestal, Switzerland; *John Storyk,* Walters-Storyk Design Group, Highland, NY, USA

L-5: **Spatial Variation of Reverberant Energy in Enclosures**—*Erik Larsen, Albert Feng,* University of Illinois at Urbana-Champaign, Urbana, IL, USA

L-6: **Audio Production in Large Office Environments**—*Eddy B. Brixen,* EBB-consult, Smorum, Denmark

Sunday, October 12
2:00 PM—6:00 PM

SESSION M: SIGNAL PROCESSING FOR AUDIO, PART 2

Chair: *Brett Crockett*, Dolby Labs, San Francisco, CA, USA

M-1: **Diffuse Field Reverberation Modeled as a Flat Fading Channel**—*Andrew Eloff,* Raw Thrills, Inc., Niles, IL, USA; *Gary Kendall, Michael Honig,* Northwestern University, Evanston, IL, USA

M-2: **Intelligent Class D Amplifier Controller Integrated Circuit as an Ingredient Technology for Multichannel Amplifier Modules of Greater than 50 Watts/Channel**—*Steven Harris, Jack Andersen, Daniel Chieng,* D2Audio Corporation, Austin, TX, USA

M-3: **High Quality Multichannel Time-Scaling and Pitch-Shifting Using Auditory Scene Analysis**—*Brett Crockett,* Dolby Laboratories, San Francisco, CA, USA

M-4: **Adaptive Digital Calibration of Over-Sampled Data Converter Systems**—*Thomas Holm Hansen, Lars Risbo,* Texas Instruments Denmark, Copenhagen NV, Denmark; University of Copenhagen, Copenhagen NV, Denmark; *Lars Risbo,* Texas Instruments Denmark, Copenhagen NV, Denmark

M-5: **Efficient Algorithms for Look-Ahead Sigma-Delta Modulators**—*James Angus,* University of Salford, Salford, Greater Manchester, UK

Sunday, October 12
4:00 PM—5:30 PM

SESSION Z6: POSTERS: SOUND QUALITY AND LISTENING TESTS

Z6-1: **Authentic Reproduction of Stereo Sound—A Wiener Filter Approach**—*Sang-Myeong Kim,* Kwang-Institute of Science & Technology, Gwangju, Korea

Z6-2: **Objective Evaluation of Noise Reduction Algorithms in Speech Applications**—*Karthikeyan Umapathy, Vijay Parsa,* University of Western Ontario, London, Ontario, Canada

Z6-3: **Directivity Balloons of Real and Artificial Mouth Simulators for Measurement of the Speech Transmission Index**—*Fabio Bozzoli, Angelo Farina,* University of Parma, Parma, Italy

Z6-4: **Intrusive Speech Transmission Quality Measurements for Low Bit-Rate Coded Audio Signals**—*Jan Holub,* Czech Technical University, Prague, Czech Republic; *Michael D. Street,* NATO, The Hague, The Netherlands; *Radislav Smid,* Czech Technical University, Prague, Czech Republic

Z6-5: **Automatic Level Alignment for Arbitrary Multichannel Reproduction System**—*Se-Ung Kim, Sin-Lyul Lee, Lae-Hoon Kim, Koeng-Mo Sung,* Seoul National University, Seoul, Korea

Monday, October 13
9:00AM—12:00 NOON

SESSION N: ANALYSIS AND SYNTHESIS OF SOUND

Chair: *Oliver Hellmuth*, Fraunhofer Institute for Integrated Circuits IIS, Erlangen, Germany

N-1: **Object-Based 3-D Audio Scene Representation**—*Dae-young Jang, Jeongil Seo, Kyeongok Kang,* ETRI, Daejeon, Korea; *Hoe-Kyung Jung,* Paichai University, Daejeon, Korea

N-2: **A Flexible Resynthesis Approach for Quasi-Harmonic Sounds**—*Harvey Thornburg, Randal Leistikow,* Stanford University, Stanford, CA, USA

N-3: **Objective Prediction of Sound Synthesis Quality**—*Brahim Hamadicharef, Emmanuel Ifeachor,* University of Plymouth, Plymouth, Devon, UK

N-4: **Automatic Classification of Large Musical Instrument Databases Using Hierarchical Classifiers with Inertia Ratio Maximization**—*Geoffroy Peeters,* IRCAM, Paris, France

N-5: **Virtual Analog Synthesis with a Time-Varying Comb Filter**—*David Lowenfels,* Stanford University, Stanford, CA, USA

N-6: **Using MPEG-7 Audio Fingerprinting in Real-World Applications**—*Oliver Hellmuth, Eric Allamanche,* Fraunhofer Institute for Integrated Circuits IIS, Erlangen, Germany; *Markus Cremer, Holger Grossmann,* Fraunhofer Institute for Integrated Circuits IIS, AEMT, Ilmenau, Germany; *Jürgen Herre, Thorsten Kastner,* Fraunhofer Institute for Integrated Circuits IIS, Erlangen, Germany

MONDAY

Monday, October 13
9:00AM—10:30 AM

SESSION O: AUTOMOTIVE AUDIO

Chair: *Richard Stroud*, Stroud Audio, Inc., Kokomo, IN

O-1: **Implementation of a Double StereoDipole System on a DSP Board—Experimental Validation and Subjective Evaluation Inside a Car Cockpit**—*Christian Varani, Enrico Armelloni, Angelo Farina,* University of Parma, Parma, Italy

O-2: **A Development of a Digital Amplifier for Car Use**—*Kenichi Taura, Masayuki Tsuji,* Mitsubishi Electric Corporation, Kyoto, Japan; *Tsuyoshi Nakada, Masayuki Ishida,* Mitsubishi Electric Corporation, Hyogo, Japan

O-3: **Software Radio Receiver for Audio and Video Broadcasting Systems**—*Maja Sliskovic, Hans-Jürgen Nitzpon,* Harman/Becker Automotive Systems, Karlsbad, Germany

Monday, October 13
2:00 PM—5:00 PM

SESSION P: ARCHIVING AND RESTORATION

Chair: *David Ackerman*, Consultant, Boston, MA, USA

P-1: **Subband Adaptive Filtering for Acoustic Noise Reduction**—*Hesu Huang, Chris Kyriakakis,* University of Southern California, Los Angeles, CA, USA

P-2: **Multi-Frequency Noise Removal Based on Reinforcement Learning**—*Ching-Shun Lin, Chris Kyriakakis,* University of Southern California, Los Angeles, CA, USA

P-3: **Music Identification with MPEG-7**—*Holger Crysandt,* Aachen University, Aachen, Germany

P-4: **High Frequency Reconstruction by Linear Extrapolation**—*Chi-Min Liu, Wen-Chieh Lee, Han-Wen Hsu,* National Chiao Tung University, Hsin-Chu, Taiwan

P-5: **Audio Storage and Networking in the Digital Age**—*Doug Perkins, Amnon Sarig,* mSoft Inc., Woodland Hills, CA, USA

P-6: **The Requirement for Standards in Metadata Exchange for Networked Audio Environments**—*Nicolas Sincaglia,* Listen.com Inc., San Mateo, CA, USA

Monday, October 13
1:30 PM—4:00 PM

SESSION Q: SPATIAL AUDIO

Chair: *Gunther Theile*, IRT, Munich, Germany

Q-1: **An Investigation of Layered Sound**—*Peter Mapp,* Peter Mapp Associates, Colchester, UK

Q-2: **Authoring System for Wave Field Synthesis Content Production**—*Frank Melchior, Thomas Röder, Sandra Brix, Stefan Wabnik,* Fraunhofer IIS-AEMT, Ilmenau, Germany; *Christian Riegel,* Tonbüro Berlin, Berlin, Germany

Q-3: **A Sound Localizer Robust to Reverberation**—*José Vieira, Luís Almeida,* Universidade de Aveiro, Aveiro, Portugal

Q-4: **Modification of Loudspeaker Generated Direction Cues Through Assistant Headphones**—*Banu Gunel,* Queen's University of Belfast, Belfast, UK

Q-5: **Spherical Microphone Array for Spatial Sound Recording**—*Jens Meyer, Tony Agnello,* mh acoustics, Summit, NJ, USA

Monday, October 13
2:00 PM—3:30 PM

SESSION Z7: POSTERS: PSYCHOACOUSTICS AND CODING, PART 1

Z7-1: **Cascaded Trellis-Based Optimization for MPEG-4 Advanced Audio Coding**—*Cheng-Han Yang, Hsueh-Ming Hang,* National Chiao Tung University, Hsinchu, Taiwan

Z7-2: **Implementing MPEG Advanced Audio Coding and Layer-3 Encoders on 32-Bit and 16-Bit Fixed-Point Processors**—*Marc Gayer, Markus Lohwasser, Manfred Lutzky,* Fraunhofer Institute for Integrated Circuits IIS, Erlangen, Germany

Z7-3: **An Extended-Run-Length Coding Tool for Audio Compression**—*Dai Yang, Takehiro Moriya, Akio Jin, Kazunaga Ikeda,* NTT Cyber Space Laboratories, NTT Corporation, Musashino, Japan

Z7-4: **Implementation of Interactive 3-D Audio Using MPEG-4 Multimedia Standards**—*Jeongil Seo, Gi Yoon Park, Dae-Young Jang, Kyeoungok Kang,* ETRI, Deajon, Korea

Z7-5: **Error Mitigation of MPEG-4 Audio Packet Communication Systems**—*Schuyler Quackenbush,* Audio Research Labs, Scotch Plains, NJ, USA; *Peter Driessen,* University of Victoria, Victoria, British Columbia, Canada

Z7-6: **Combined Source and Perceptual Audio Coding**—*Aníbal Ferreira,* University of Porto/INESC Porto, Porto, Portugal; *André Rocha,* INESC Porto, Porto, Portugal

Z7-7: **Phase Transmission in a Sinusoidal Audio and Speech Coder**—*Albertus den Brinker, Andy Gerrits, Rob Sluijter,* Philips Research Laboratories, Eindhoven, The Netherlands

Z7-8: **Objective Estimates of Partial Masking Thresholds for Mobile Terminal Alert Tones**—*David Isherwood, Ville-Veikko Mattila,* Nokia Research Center, Tampere, Finland

Monday, October 13
4:00 PM—5:30 PM

SESSION R: SOUND REINFORCEMENT

Chair: *Peter Mapp*, Peter Mapp Associates, Colchester, UK

R-2: **A Method of Loudspeaker Directivity Prediction Based on Huygens-Fresnel Principle**—*Arkady Gloukhov,* Consultant, St. Petersburg, Russia

R-3: **Some Effects of Equalization on Sound System Intelligibility and Measurement**—*Peter Mapp,* Peter Mapp Associates, Colchester, UK

Monday, October 13
4:00 PM—5:30 PM

SESSION Z8: POSTERS: PSYCHOACOUSTICS AND CODING, PART 2

Z8-1: **Lossless Compression for Audio Data in the IEEE Floating-Point Format**—*Dai Yang, Takehiro Moriya,* NTT Cyber Space Laboratory, Tokyo, Japan

Z8-2: **Optimum Quantization of Flattened MDCT Coefficients**—*Aníbal Ferreira,* INESC Porto, Porto, Portugal

Z8-3: **Low Frequency Optimization and Nonbass Masking Effects for Sound Field Recreation**—*Dai Yang, Takehiro Moriya, Graeme Huon, Zeliko Velican,* Huonlabs, Victoria, Australia

Z8-4: **An Information-Theoretic Model for Audio Watermarking**—*Ruihua Ma,* Institute for Infocomm Research, Singapore

Z8-5: **Watermark Insertion into MP3 Bitstram Using the Linbits Characteristics**—*Seung-Jin Yang, Do-Hyoung Kim, Jae-Ho Chung,* Inha University, Incheon, Korea

Z8-6: **Perceptual Convolution Algorithm for Reverberation**—*Wen-Chieh Lee, Chung-Han Yang, Chi-Min Liu,* National Chiao Tung University, Taiwan; *Jiun-In Guo,* National Chung Cheng University, Taiwan

Z8-7: **Advances in Trellis-Based SDM Structures**—*Erwin Janssen, Derk Reefman,* Philips Research, Eindhoven, The Netherlands

PRELIMINARY 115th AES CONVENTION CALENDAR

	START	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:30	5:00	5:30	6:00	6:30	7:00	7:30	
Oct 8	Standards			Standards Meetings																						Oct 8
Oct 9																		REGISTRATION (4:00 - 7:00 pm)								Oct 9
	Spec Events			REGISTRATION		SURROUND LIVE! - SYMPOSIUM ON MIXING FOR LIVE SURROUND SOUND at MANHATTAN CENTER																				
	Standards			Standards Meetings																						
FRIDAY, Oct 10				REGISTRATION																						FRIDAY, Oct 10
	Exhibits			EXHIBITS																						
	Paper Sessions		AES ANNUAL BUSINESS MEETING	A AUDIO FOR GAMES						OPENING CEREMONY		TC GAMES AUDIO		B LOUDSPEAKERS - 1				D HIGH RESOLUTION AUDIO				TC HI RES AUDIO		AES MIXER		
										AWARDS PRESENTATION				C LOW BIT-RATE AUDIO CODING						E MICROMACH.		TC AUDIO CODING				
	Posters					Z1 ACOUST.&SOUND REPROD.				KEYNOTE ADDRESS by ARIF MARDIN				Z2 NETWORKING				Z3 LOUDSPEAKERS								
	TC Meetings											TC MICROPHONES														
	Workshops			W1 DIGITAL AUDIO WORKSTATIONS								W2 HIGH RESOLUTION AUDIO - THE FUTURE						W3 AUDIO FOR GAMES								
	Tutorial.Sem.			TS1 MIC TECHNIQUES FOR STEREO / SURROUND								TS2 BASICS OF DIGITAL AUDIO				TS3 POWERED LOUDSP.		TS4 GROUNDING / SHIELDING								
	Exh.Seminars													EXHIBITOR SEMINARS												
	Students																					SDA-1				
	Historical											VINYL GOES DIGITAL														
	Spec Events												REBUILDING NEW YORK BROADCASTING					GRAMMY® RECORD. SOUNDTABLE								
	Tech Tours			T1 ED SULLIVAN THEATRE-UPGRADE TO HIGH DEFINITION								T2 SYNC SOUND RECORDING STUDIO														
	Standards			Standards Meetings																						
SATURDAY, Oct 11				REGISTRATION																						SATURDAY, Oct 11
	Exhibits					EXHIBITS																				
	Paper Sessions			F PSYCHOAC., PERCEPTION AND LISTENING TESTS - 1						TC PERCEPTION				H PSYCHOAC., PERCEPTION AND LISTENING TESTS - 2							TC TELECOMMUNICATIONS		. HEYSER LECTURE by RAY KURZWEIL followed by . TECHNICAL COUNCIL RECEPTION			
				G INSTRUMENTATION AND MEASUREMENT						TC BROADCASTING				I LOUDSPEAKERS-2							TC LOUDSP. & PHONES					
	Posters													Z4 SIGNAL PROCESSING - 1				Z5 SIGNAL PROCESSING - 2								
	TC Meetings									TC SEMANTIC ANALYSIS											TC STUDIO PRACTICES					
	Workshops			W4 SOUND FOR SPORTS FACILITIES				W5 SOUND FOR BROADWAY						W6 AFTERMARKET AUTO AUDIO					W7 LINE ARRAYS							
	Tutorial Sem.			TS5 SURROUND SOUND MIXING					TS6 A/D CONVERTERS					TS7 COMPRESSORS		TS8 MIC PREAMPLIFIERS			TS9 EQUALIZERS							
	Exh.Seminars						EXHIBITOR SEMINARS							EXHIBITOR SEMINARS				EXHIBITOR SEMINARS								
	Students					POSTERS & DESIGNS								ONE ON ONE MENTORING - 1												
	Historical					VINYL GOES DIGITAL																				
	Spec Events			LIBRARY OF CONGRESS					AUDIO PROCESSING FOR BROADCAST																	
											PLATINUM PRODUCERS							SPARS BUSINESS PANEL								
	Tech Tours			T3 THE HISTORY OF FM & ALPINE TOWER								T-5 LOEW'S JERSEY THEATER														
				T4 COLUMBIA-PRINCETON ELECTR. MUSIC CENTER																						
	Standards			Standards Meetings																						
SUNDAY, Oct 12				REGISTRATION																						SUNDAY, Oct 12
	Exhibits					EXHIBITS																				
	Paper Sessions			J MULTICHANNEL AUDIO						TC MULTICHANNEL				L ROOM ACOUSTICS					TC ACOUSTICS & SOUND REINF.				CENTRAL SYNAGOGUE TOUR followed by Organ Concert		ORGAN CONCERT by GRAHAM BLYTH	
				K SIGNAL PROCESSING FOR AUDIO - 1						TC SIGNAL PROCESSING				M SIGNAL PROCESSING FOR AUDIO - 2					TC RECORDING & STORAGE							
	Posters													Z6 SOUND Q., LISTEN.TESTS												
	TC Meetings								TC NETWORK AUDIO										TC ARCHIVING & RESTOR.							
	Workshops			W8 MPEG-4 AUDIOBIFS MODELS				W9 DVD AUTHORING					W10 MASTERING				W11 PRACTICAL STUDIO DESIGN								
	Tutorial Sem.			TS10 AUDIO NETWORKS				TS11 SYSTEM OPTIMIZATION					TS12 FIREWIRE AND USB			TS13 STAGE MONITORING		TS14 RIGGING FOR DUMMIES								
	Exh.Seminars						EXHIBITOR SEMINARS							EXHIBITOR SEMINARS				EXHIBITOR SEMINARS								
	Students						EDUCATION FAIR							ONE ON ONE MENTORING - 2												
															RECORDING COMPETITION											
	Historical					VINYL GOES DIGITAL																				
	Spec Events									DIGITAL BROADCASTING IN THE USA						SOUND SYSTEMS AND HUMAN HEARING										
											PLATINUM ENGINEERS																
	Tech Tours			T6 JUDY AND ARTHUR ZANKEL HALL								T7 KAUFMAN ASTORIA STUDIOS														
	Standards			Standards Meetings																						
MONDAY, Oct 13				REGISTRATION																						MONDAY, Oct 13
	Exhibits					EXHIBITS																				
	Paper Sessions			N ANALYSIS AND SYNTHESIS OF SOUND									P ARCHIVING AND RESTORATION													
				O AUTOMOTIVE AUDIO		TC AUTOMOTIVE AUDIO							Q SPATIAL AUDIO						R SOUND REINF.							
	Posters													Z7 PSYCHOAC.&CODING -1				Z8 PSYCHOAC.&CODING -2								
	Workshops			W12 AUDIO SEMANTICS		W13 SPEECH INTELLIGIBILITY							W14 SURROUND FROM STEREO													
	Tutorial Sem.			TS15 TIME DOMAIN MEAS.		TS16 WORKING WITH MICROPHONES							TS17 LISTENING TESTS IN PRACTICE													
	Exh.Seminars					EXHIBITOR SEMINARS																				
	Students					ONE ON ONE MENTORING - 3					SDA-2															
						EDUCATION FORUM																				
	Historical					VINYL GOES DIGITAL																				
	Spec Events						TEMPLES OF SOUND				ROAD WARRIORS - LIVE SOUND				ROAD WARRIORS - LIVE RECORD.											
	Tech Tours			T8 STUDIO OPEN HOUSE - AVATAR & HIT FACTORY								T9 BROOKLYNPHONO PRESSING PLANT														
	Standards			Standards Meetings																						

Exhibitor List as of 8/28/03, listed alphabetically.

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A

A.D.A.M. Audio GmbH
A Designs
Aardvark
ACO Pacific, Inc.
Acoustic Systems
Acoustical Solutions, Inc.
Adamson Systems Engineering
ADK Microphones
AEA
AES NY Section
AES Standards
Akai Musical Instrument Corporation
AKG Acoustics, US
AKM Semiconductor, Inc.
Alcorn McBride, Inc.
Allen & Heath USA
Amek
Amphenol Audio
Analog Devices, Inc.
Apex N.V.
Apogee Electronics, Inc.
Applied Microphone Technology
Architectural Acoustics/ MediaMatrix-Peavey
Arturia
ATC/Transamerica Audio Group, Inc.
ATI—Audio Technologies, Inc.
The ATI Group
ATR Service Co.
Audio Accessories, Inc.
Audio Amateur Inc.
Audio Developments
Audio Engineering Associates
Audio History Library
Audio, Ltd./MacArthur Group
Audio Media US
Audio Precision
Audio-Technica U.S., Inc.
Audio Technology Magazine
Audix Corporation
Auralex Acoustics
Avalon Design, Inc.
Aviom, Inc.

B

Bag End Loudspeakers
Bang & Olufsen ICEpower a/s
Belden Electronics Division
Berklee College of Music
BIAS (Berkley Integrated Audio Software)
BLUE Microphones
Blue Sky/Group One
Boston Skyline Studio, LLC
Brainstorm Electronics, Inc.
Brauner
Broadcast—Traffic Concepts, Inc.
Brother International Corporation
Bruel & Kjaer North America
Bryston Ltd.
BSS Audio
BTX

C

Cable Factory
CAD Professional Microphones
Cadac Electronics Ltd.
Cakewalk
Calrec Audio Ltd.
CB Electronics
Cedar Audio Limited
Celestion/Group One Ltd.
Chandler Limited
Cherry Lane Magazines, LLC— Home Recording Magazine
Chevin Research
Production Media (Church Production Magazine)
Cirrus Logic Inc.
Clarion Musical Instument Insurance
CM Labs
Coding Technologies
Coleman Audio
Coles Microphones
Coles/AEA
Community Professional Loudspeakers
Cooper Sound Systems
Countryman Associates, Inc.
Course Technology
Crane Song Ltd.
Creative Network Design
Crest Audio
Crown International
Cycling '74

D

D.A.S. Audio
D.W. Fearn
D2Audio Corporation
DACS Ltd
Dan Dugan Sound Design
dbx Pro
DCS
Desch Audio GmbH
DiGiCo/Soundtracs
Digidesign
Digidesign Development Partners
Digigram
Disc Makers
DK Audio A/S
Dolby Laboratories, Inc.
Doremi Labs, Inc.
Dorrough Electronics
DPA Microphones
Drawmer (USA)/Transamerica Audio Group, Inc.
Digital Theater Systems, Inc.
DVD Audio Council

E

E-mu Systems
Earth Works Audio Products
Eastern Acoustic Works, Inc.
Edirol Corporation
Electro—Harmonix
Focal Press, An Imprint of Elsevier Science
EMM Labs
Equi=Tech Corporation
Euphonix, Inc.
Eventide, Inc.
Ex'pression Center for New Media

F

Fairlight
Film-Tek & Associates, Inc.
Five Towns College
Focal America
Fostex America
Francis Manzella Design Ltd.
Fraunhofer Institut Fuer Integrierte Schaltungen
Friend-Chip
Front of House Magazine
Furman Sound
Future Media Concepts, Inc.
FXpansion Audio UK Ltd.

G

G.R.A.S. Sound + Vibration
Gefen Systems
Genelec
Geoffrey Daking & Co., Inc.
Gepco International, Inc.
Gibson Labs
Glyph Technologies
GML, LLC
Gold Line/TEF
Gordon Instruments
Grace Design
Great River Electronics Inc.
Griffin Audio Design
Groove Tubes
Group One Ltd.

H

H.E.A.R.—Hearing Education & Awareness for Rockers
Hacousto/Sonic Systems, Inc.
Harrison by GLW, Inc.
Hear Technologies
House Ear Research Institute
HPV Technologies
Huge Universe—Formally Live Sound! International & Prosoundweb

I

Imas Publishing—Audio Media/ Pro Audio Review
Independent Audio
Industrial Acoustics Co.
Infinium Technologies Ltd
Innova-son
Innovative Electronic Designs, Inc.
Inter-M Americas, Inc.
IZ Technology Corp.

J

JBL Professional
Joemeek
The John Hardy Company
Josephson Engineering
JRF Magnetic Sciences

K

Keen Ocean Industrial Ltd.
Kilo International
Klein + Hummel North America
Klippel GmbH

L

L-Acoustics US
Lake Technology Limited
LARES Associates
Lavry Engineering (formerly dB Technologies)
Lawson, Inc.
Lectrosonics, Inc.
Level Control Systems
Lexicon, Inc.
Linn Products Ltd
Listen, Inc.
Little Labs
LiveWire Remote Recorders Ltd.
Logitek Electronic Systems, Inc.
Lundahl Transformers AB

M

M-Audio Inc.
Mackie Designs
Magtrax
Manifold Labs
Manley Laboratories, Inc.
Marian Digital Audio Electronics
Mark of the Unicorn (MOTU)
Martin Audio
MC2 Audio Ltd./Group One
McCauley Sound, Inc.
Audio Underground/ Mercenary Edition Lounge
Mercury Recording Equipment Co.
Merging Technologies
Metric Halo Distribution, Inc.
Meyer Sound Laboratories, Inc.
Mia Press
Millennia Media, Inc.
Mix
Mixed Logic Studio Electronics
Modulation Sciences
Mogami Cables
mSoft Inc.
The Museum of Sound Recording
Music And More (MAM)
Music Maker Publications— Recording Magazine
MXL Microphones

N

Nagra USA, Inc.
National Instruments
Native Instruments gmbh
Nemal Electronics Intl., Inc.
Netcira by Fostex
Networksound, Inc.
Neumann/USA
Neutrik USA, Inc.
NTI—Neutrik Test Instrument
Nexo USA
NHT Pro
Noren Products, Inc.
Norris-Whitney Communications
National Systems Contractors Association

O

OKM Microphones
Otari Corporation

P

Parsons Audio— Center for Audio Studies
Pearl Microphones
Pendulum Audio, Inc.
Performance Devices
Phoenix Audio International/Transamerica
Plitron Manufacturing, Inc.
Plus24
PMC Monitors
PMI Audio Group
Post Magazine (Advanstar Communications)
Posthorn Recordings
Powerphysics
Precision Laboratories
PreSonus Audio Electronics
Prime LED
Primedia Business
Primera Technology Inc.
Prism Media Products, Inc
Proac-Modern Audio
Professional Audio Design, Inc.
Purple Audio, Inc.

Q

QSC Audio Products, Inc.
Quantum Technolgies, Inc.

R

Radial Engineering (A Division of CableTek)
Rane Corporation
RealTraps
The Recording Studio Insurance Program
Redco Audio, Inc.
Renkus-Heinz, Inc.
Resolution (S2 Publications Ltd.)
Rohde & Schwarz GmbH & Co. KG
Roland Corporation
Royer Labs

S

Sabine, Inc.
Sabra-som Ltd. (K-IV Enterprises)
SADIE UK
SAE Institute of Technology
Sam Ash Professional Audio Group
Sanken Microphones
Schoeps Mikrofone
SE Electronics
SEK'D
Seltron Components Ltd.
Sennheiser Electronics Corp.
Seven Woods Audio, Inc.
Shep Associates Ltd.
Shure Incorporated
Signex
SLS Loudspeakers
Solid State Logic
Sommer Cable
Sonicraft
Sonosax
Sony Electronics, Inc.
Sony Super Audio CD
Sound Construction & Supply Inc.
Sound Devices, LLC
Sound Ideas
Sound on Sound Magazine
Soundcraft
Soundelux Microphones
Soundfield Research/ Transamerica Audio Group
SPARS
SPL Electronics GmbH
SRS Labs, Inc.
Stage Accompany
Steinberg—The Audio Group of Pinnacle Systems
STUDER
Studio Network Solutions
Studio Projects
Studio Technologies, Inc.
Summit Audio, Inc.
Sunrise E.& E. Inc.
Swissonic
Switchcraft, Inc.

T

Tamura Corporation
Tannoy North America Inc.
TASCAM
TC Electronic Inc.
Tekserve Corporation
Telefunken North America, LLC
TerraSonde
Testa Communications
Texas Instruments
THAT Corporation
THX Ltd.
Toft Audio Designs
Total Production U.S.
ToteVision
Trident Audio
True Systems
Turbo Sound

U

Ultrasone AG
Under Cover
United Entertainment Media
Universal Audio

V

Videotek
Vintech Audio
Virtual Mixing Company
Voyager Sound Inc.

W

Wacom Technology
Walters-Storyk Design Group
Wave Distribution
Wave Arts, Inc.
Wave Mechanics
Wavefront Semiconductor
Waves, Inc.
Westlake Audio
Whirlwind
Wireworks Corporation
Wohler Technologies, Inc.

X

X-Vision Audio US Ltd.
Xilica Audio Design
XTA Electronics/Group One Ltd.

Y

Yamaha Corporation of America
Yamaha mLAN Licensing Office

Z

Z-Systems, Inc.
Zaxcom Audio