

# 57TH ANNUAL BROADCAST ENGINEERING CONFERENCE

Digital Broadcasting Goes Mainstream

## 2003

# SUMMARY OF PRESENTATIONS



**THE WORLD'S LARGEST  
ELECTRONIC MEDIA SHOW**

April 5-10, 2003 - Las Vegas, NV





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## **BROADCAST ENGINEERING CONFERENCE**

### **57TH ANNUAL NAB BROADCAST ENGINEERING CONFERENCE**

#### **Digital Broadcasting Goes Mainstream**

**APRIL 5-10, 2003**

**LAS VEGAS, NEVADA**

#### **SUMMARY OF PRESENTATIONS**

This booklet contains summaries of the presentations at the 57th NAB Broadcast Engineering Conference held at the Las Vegas Convention Center, April 5-10, 2003 in association with NAB2003. This year's conference brings together experts in all the varied fields that make up broadcasting today. The NAB Broadcast Engineering Conference Committee and the NAB Science and Technology Department have used all available resources to bring the most important technical presentations and workshops to this year's NAB convention.

The full text of many of these presentations is contained in the NAB publication, the *57th Annual NAB Broadcast Engineering Conference Proceedings*. This book and accompanying CD-ROM (or just CD-ROM) are available at any of the NAB stores at the convention or can be ordered through NAB Services by calling: +1 (202) 429-5373 or +1 (800) 368-5644.

The NAB Broadcast Engineering Conference features the best educational content available for the practicing broadcast engineer. The communications world is changing and the technologies driving these changes must be understood and carefully considered. This conference is produced with the assistance of partner organization the Society of Broadcast Engineers and covers major issues relating to digital television and digital radio.

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SATURDAY, APRIL 5, 2003 • 9:00 AM - 6:00 PM

## **SBE ENNES WORKSHOP**

**LAS VEGAS CONVENTION CENTER - ROOM N111**

The Society of Broadcast Engineer's ENNES 2003 Workshop is designed to bring broadcast engineers the most up-to-date information on today's most compelling broadcast technology and operational issues. The morning sessions are focused on digital audio broadcasting, while the afternoon session targets centralization and broadcast operational efficiency.

Presenters, all working industry technical leaders, have been ask to provide nuts-and-bolts descriptions, and spotlight important take-away points, economics, and operational impacts. The program is intended to be fast moving, intense, and provide broadcast engineers with information they need to be successful.

**Chairpersons: WILLIAM HAYES, IOWA PUBLIC TELEVISION, JOHNSTON, IA; FRED BAUMGARTNER, COMCAST DIGITAL PROGRAMMING CENTER, LITTLETON, CO**

**9:00 AM**

### **AUDIO PROCESSING FOR DIGITAL TRANSMISSION**

In addition to the dynamic range control and processing employed for analog transmission, Digital Audio Broadcast systems strive for the best audio in the least amount of bandwidth. Neural Audio is dedicated to developing audio processing and preprocessing tools for the bit-limited digital transmission environment. The presentation covers methods and means of processing for DAB.

**Presenter: ROBERT REAMS, NEURAL AUDIO, SEATTLE, WA**

**9:30 AM**

### **UNDERSTANDING THE XM RADIO TRANSMISSION SYSTEM**

XM's revolutionary satellite radio architecture incorporates state-of-the-art technologies with its own proprietary innovations. XM has created a robust, reliable delivery system characterized by superior digital processing and encoding technology, unparalleled satellite signal strength and terrestrial repeater coverage together with the design and mass-production of its proprietary receiver chipset.

**Presenter: TONY MASIELLO, XM SATELLITE RADIO, WASHINGTON, DC**

**10:00 AM**

## **UNDERSTANDING THE SIRIUS RADIO TRANSMISSION SYSTEM**

Satellite Radio for the mobile environment is a medium which didn't even exist four years ago. Today, Sirius Satellite Radio provides over 100 channels of digitally transmitted audio and data services directly to end users via a system of three moving satellites in highly inclined elliptical orbits plus ground based gap filler transmitters. This presentation will provide an overview of the technology including details of the transmission infrastructure, studio/production networks and audio coding solutions.

**Presenter: MARK KALMAN, SIRIUS RADIO, NEW YORK, NY**

**11:00 AM**

## **UNDERSTANDING THE IBIQUITY IBOC TRANSMISSION SYSTEMS**

This talk will focus on the audio compression technology employed in iBiquity's In-Band On-Channel (IBOC) standard: PAC. In particular the features of the audio codec which were specifically designed/optimized for the IBOC system and audio processing optimization for the IBOC system. Further, the presentation will cover studio issues (including tandem coding) related to the digital broadcast system.

**Presenter: DEEPEN SINHA, IBIQUITY DIGITAL, WARREN, NJ**

**11:30 AM**

## **EMPLOYING ASI IN BROADCAST STATION DESIGN**

ASI (Asynchronous Serial Interface) is fast becoming a popular standard for moving and working with video. Scott will discuss the essential requirements of dealing with the ASI signal on 75-ohm copper baseband topology and the many practical applications that this interface has been used for. It will also touch on the future of ASI and the opportunities for manufacturers and users to expand and develop ASI.

**Presenter: SCOTT BARELLA, BURST COMMUNICATIONS, CENTENNIAL, CO**

**12:30 PM**

## **IP BASED CONTENT DISTRIBUTION**

As the broadcast industry moves further down the path of migration from traditional analog standards of distribution of rich media content (i.e. video/audio) into the digital realm, interoperability issues continually emerge as a significant roadblock. The scope of this presentation is to illustrate a real-world implementation of a standards-based digital distribution and content management methodology. The intent is to convey the advantages of using evolving

technologies to deliver rich media content in a more efficient manner than the traditional method of scheduled linear feeds.

**Presenter: JOE FABIANO, PATHFIRE, ROSWELL, GA**

**1:30 PM**

### **CONNECTIVITY FOR CENTRALIZATION**

It has often been said that all TV broadcasting would be centralized, except for the high cost of connectivity. Finding connectivity, budgeting, negotiating for price and performance, and understanding the long haul and short haul options is the subject of this presentation. Last mile issues, often the cost and availability of which control what can and cannot be economically accomplished, present challenges and opportunities to use alternative options.

**Presenter: DANNY ROMEO, NEXUSTAR, DEL RAY BEACH, FL**

**2:00 PM**

### **USING THE ADVANCED DIGITAL DISTRIBUTION ENTITY TO IMPROVE STATION OPERATIONAL**

The Northwest Advanced Digital Distribution Entity (ADDE) was conceived as a facility to more economically distribute programming to the member stations and reduce the cost of master control operations by consolidating redundant tasks and hardware. It was predicted that operational savings and enhanced capabilities would be a result of the centralcasting effort. This presentation will discuss what we determined to be the most desirable areas of cooperation; the limitations, the risks, and how this project has helped to bring into focus what can be achieved by centralcasting with a mission to retain local identity.

**Presenter: TOM HANDY, KWSU/KTNW, WASHINGTON STATE UNIVERSITY, PULLMAN, WA**

**2:30 PM**

### **MAKING THE CENTRALIZATION DECISION**

The mere thought of the possible synergies that a centralcasting project conjures up in the head of a company CFO is enough to get budget approval at a record speed. But in the real world, a host of issues have got to be dealt with before you can even get the first purchase order written. Some of these issues are related to equipment, some to software, some to systems and some to egos and tradition. We will explore the top-level issues and some of the thinking that goes into the decision making process to get a project like this done.

**Presenter: WENDELL BAILEY, NBC, WASHINGTON, DC**

**3:00 PM**

### **THE NEW YORK TIMES - REMOTE CONTROL STATION AND TRANSMITTER MONITORING**

The New York Times Company Broadcast Group Digital Operating Center is the first facility of its kind, designed and constructed to remotely operate analog and digital television stations anywhere in the country. The facility opened in December 1998 and provides remote master-control automation, twenty-four-hour quality control and monitoring, transmitter monitoring, satellite control, and FCC and program logging services. The multimillion dollar center was developed in response to the onset of digital television and the need to monitor signals in a multichannel environment

**Presenter: FRANK CHEBALO, THE NEW YORK TIMES COMPANY DIGITAL OPERATING CENTER/WTKR-TV, NORFOLK, VA**

**3:30 PM**

### **MCGRAW-HILL'S CENTRALCASTING INITIATIVE**

This presentation covers McGraw-Hill's centralcasting experience and plans with an emphasis on the technical structure and operational features.

**Presenter: RON JENNINGS, MCGRAW HILL, SAN DIEGO, CA**

**4:00 PM**

### **THE EVOLUTION OF LIN BROADCASTING'S CENTRALIZATION**

This discussion will review the centralcasting approach at LIN television. It will examine the evolution of systems and issues that have impacted the move to more centralized environments. A focus on the current technologies in use and the efficiencies they create will also be examined.

**Presenter: LAWRENCE OAKS, LINTV, INDIANAPOLIS, IN**

**4:30 PM**

### **CENTRALIZED CONTENT AND CONTROL AT THE EMMIS TELEVISION DIVISION**

A review of the Emmis Television division launch and operation of centralized content and control origination facility servicing five television stations. The discussion will cover technical, personnel and operational issues in the successful operation of a centralized television content distribution.

**Presenter: MIKE MCKINNON, EMMIS COMMUNICATIONS, INDIANAPOLIS, IN**

**5:00 PM**

### **THE PROPOSED, NEW AND IMPROVED CLEAR CHANNEL CENTRALCASTING PLATFORM**

The new (C-4) system is Clear Channel's next generation centralcasting platform. The presentation will

detail the lessons learned in the now famous Clear Channel centralization efforts, and look forward to refining the process.

**Presenter: MICHAEL DECLUE, CLEAR CHANNEL COMMUNICATIONS, TULSA, OK**

**5:30 PM**

### **PANEL DISCUSSION**

In the tradition of Ennes Workshop's of year past, an open-ended discussion asks the afternoon presenters to participate in a session of information exchange with the audience.

**SATURDAY, APRIL 5, 2003 • 9:00 AM - 1:00 PM**

## **IEEE/BTS TUTORIAL - 8 VSB ENHANCEMENTS**

**LAS VEGAS CONVENTION CENTER - ROOM N109**

The Advanced Television Systems Committee (ATSC) is nearing completion on its investigation into enhancements to the current 8-VSB standard for digital television transmission. In anticipation of an enhanced standard being adopted later this year, this tutorial will serve as a primer on the technologies the standard will incorporate, and it will review the expected performance improvements, based on results of laboratory and field testing. Topics will include: background on 8-VSB modulation; overview of enhancements considered; details of the selected technologies; backwards-compatibility, laboratory, and field testing results; robust-mode transport-stream issues; and status of the ATSC process. The presenters will be technical experts from the system developers, testing organizations, and ATSC specialist groups. This session co-produced by the IEEE Broadcast Technology Society.

**Moderator: TOM GURLEY, MSTV, WASHINGTON, DC**

**9:00 AM**

### **INTRODUCTION**

**Moderator: TOM GURLEY, MSTV, WASHINGTON, DC**

**9:15 AM**

### **BACKGROUND ON 8VSB AND OVERVIEW OF POTENTIAL ENHANCEMENTS**

**Presenter: YIYAN WU, COMMUNICATIONS RESEARCH CENTRE CANADA, OTTAWA, CANADA**

**10:00 AM**

### **DETAILS OF ZENITH/ATI DUAL-STREAM SYSTEM**

**Presenter: WAYNE BRETL, ZENITH ELECTRONICS CORP, LINCOLNSHIRE, IL**

**11:00 AM**

**LABORATORY TESTS**

Presenter: CHARLES EINOLF, ADVANCED TELEVISION  
TECHNOLOGY CENTER, ALEXANDRIA, VA

**11:30 AM**

**BACKWARDS COMPATIBILITY TESTS**

Presenter: YIYAN WU, COMMUNICATIONS RESEARCH CENTRE  
CANADA, OTTAWA, CANADA

**11:45 AM**

**FIELD TESTS**

Presenter: VICTOR TAWIL, ASSOCIATION FOR MAXIMUM  
SERVICE TELEVISION, INC., WASHINGTON, DC

**12:30 PM**

**TRANSPORT STREAM ISSUES**

Presenter: ART ALLISON, NAB SCIENCE & TECHNOLOGY,  
WASHINGTON, DC

**12:45 PM**

**WRAP-UP & STATUS OF STANDARDS PROCESS**

Moderator: TOM GURLEY, MSTV, WASHINGTON, DC

**SATURDAY, APRIL 5, 2003 • 2:00 PM - 4:00 PM**

**HDTV CODECS - HOW MUCH  
BANDWIDTH DOES IT TAKE**

LAS VEGAS CONVENTION CENTER - ROOM N109

It was once inconceivable that high definition television could fit in a 6 MHz channel. Now MPEG codecs have improved to the point that HD can be part of a multicasting plan. How far will this go? Will MPEG compression keep up with other codec options that are evolving much more quickly? Distributing content as Internet Protocol (IP) can be even more efficient. Where should IP content distribution fit into your station's plans?

This session will tackle these issues and present available solutions for what can be incorporated into a digital television channel. We will offer grounded advice for multicasting, HD encoding rates and datacasting options. Current and future options will be explored. Microsoft will demonstrate high definition television in just 6 Mbps using IP streaming video.

Moderator: MARK O'BRIEN, SPECTRAREP, INC., CHANTILLY,  
VA

Panelists: JERRY BUTLER, PBS, ALEXANDRIA, VA  
JORDI RIBAS-CORBERA, MICROSOFT CORPORATION, REDMOND,  
WA; BEN WAGGONER, BEN WAGGONER DIGITAL, PORTLAND,  
OR; ANTHONY JONES, TANDBERG TELEVISION, SOUTHAMPTON,  
HAMPSHIRE, UK



SUNDAY, APRIL 6, 2003 • 9:00 AM - 9:30 AM

## **BROADCAST ENGINEERING CONFERENCE OPENING**

LAS VEGAS CONVENTION CENTER - ROOM N109

**Note: Daylight savings time starts today!**

### **DIGITAL MEDIA: CAN CONTENT, BUSINESS AND USERS COEXIST?**

Ten years after the beginning of the digital media age we are still struggling to achieve a point of equilibrium between creators, users and those providing links between the two groups. This presentation will call for less confrontation between civil liberties, technology and legislation because the ongoing warfare is damaging to all parties and should be replaced by more dialogue be conducted. If the nature of civil liberties and business aspects that must be preserved is identified, technology can provide many answers, leaving legislation the task of filling the remaining few issues.

Chairperson: **LYNN CLAUDY, NAB, WASHINGTON, DC**

Keynote: **LEONARDO CHIARIGLIONE, TELECOM ITALIA LAB,  
TORINO, ITALY**

SUNDAY, APRIL 6, 2003 • 9:30 AM - 12:00 PM

## **DTV CONVERSION ISSUES & SOLUTIONS - PART I**

LAS VEGAS CONVENTION CENTER - ROOM N109

Chairperson: **JEFF ANDREW, GANNETT BROADCASTING,  
WASHINGTON, DC**

9:30 AM

### **DTV ISSUES FROM A NETWORK POINT OF VIEW**

Presenter: **ROBERT SEIDEL, CBS, NEW YORK, NY**

9:55 AM

### **PATHS TO 2006: INTERIM VS. HIGH POWER SOLUTIONS**

Going on-air with the minimum allotted DTV power will save time and money and help to meet the FCC deadline. Are the savings associated with building a system at low power enough to validate the reduced signal coverage? Should you install a low power antenna? Is it more cost effective to install a high power solution now, foregoing the expense of installing two antennas? This presentation will seek to answer these questions, address the challenges and offer cost-saving solutions for broadcasters implementing DTV.

Presenter: **LAURA STERLING, ANDREW CORPORATION, ORLAND  
PARK, IL**

**10:20 AM**

**METHODS FOR REALIZING COMPACT, LOWER COST FILTERS FOR TERRESTRIAL DIGITAL BROADCAST APPLICATIONS**

Coupled resonator filters are required at the transmitter output for digital terrestrial broadcast. This presentation describes a new technique to reduce size, loss, and most importantly cost, all of which are premium concerns of broadcasters.

**Presenter: DEREK SMALL, MYAT INC., FALMOUTH, ME**

**10:45 AM**

**A NEW GENERATION, ULTRA-EFFICIENT, DTV TRANSMITTER USING THE MSDC IOT**

This presentation discusses the implementation of the newest, and possibly the last, innovation in IOT technology, the Multi-Stage Depressed Collector (MSDC) IOT. The presentation introduces a newly designed, ultra-efficient, DTV power amplifier and its practical integration into a complete UHF transmitter system. Installation photographs and on-air operating data will be presented.

**Presenter: GORDON GUMMELT & FRED STEFANIK, THALES BROADCAST & MULTIMEDIA, SOUTHWICK, MA**

**11:10 AM**

**ANALOG-TO-DIGITAL UPGRADEABLE TRANSMITTERS FOR THE WORLDWIDE MARKET**

Broadcasters who must replace an analog transmitter must make a business decision as to the viability of a high capital expense. Options include: continue to operate the old transmitter, replace the old analog transmitter with a new one or purchase a new transmitter that has been optimized for both digital and analog operation.

**Presenter: MARTYN HORSPOOL, HARRIS CORPORATION, MASON, OH**

**11:35 AM**

**WHAT ABOUT THOSE SHADOWS?**

An exhaustive measurement project was undertaken to determine the effect of multipath and signal loss in shadowed areas of the Denver market when a very high but distant mountain site is used for DTV. An off the air DTV booster was constructed and measured. The booster successfully filled in coverage over Boulder and completed the otherwise excellent coverage demonstrated on the tests. This presentation will discuss the relationship between height of the antenna and distance from the transmitter. It will also address the site location criteria for

on channel DTV boosters as well as the state of the art in off the air booster technology.

**Presenter: TIMOTHY CUTFORTH, VIR JAMES ENGINEERS, DENVER, CO**

**SUNDAY, APRIL 6, 2003 • 9:30 AM - 12:00 PM**

## **IBOC DAB - READY FOR PRIME TIME - PART I**

**LAS VEGAS CONVENTION CENTER - ROOM N111**

**Chairperson: MILFORD SMITH, GREATER MEDIA, INC., EAST BRUNSWICK, NJ**

**9:30 AM**

### **CHIPPING AWAY AT THE HD RADIO SYSTEM**

Receiver manufacturers are depending on semiconductor suppliers to produce low-cost solutions that are flexible enough to adapt to the rapidly evolving HD Radio market. This presentation will discuss one approach available today that makes commercial HD Radio a reality for home and automotive applications by 2003 and 2004.

**Presenter: JOHN GARDNER, TEXAS INSTRUMENTS, STAFFORD, TX**

**10:00 AM**

### **SWEPT FREQUENCY TECHNIQUES FOR EVALUATING AM ANTENNA SYSTEM BANDWIDTH**

A new system has been developed to allow rapid, accurate measurement of several antenna system parameters using swept frequency techniques with a vector network analyzer. The system uses an external amplifier and directional couplers to allow measurements on antenna systems that have significant induced signals from other sources. The measured data from this system can be used to evaluate the input impedance and far-field pattern bandwidth performance of an AM directional antenna system.

**Presenter: RONALD RACKLEY, DU TREIL, LUNDIN AND RACKLEY, INC., SARASOTA, FL**

**10:30 AM**

### **FM IBOC TRANSMISSION USING DUAL INPUT ANTENNAS**

The use of a dual-input antenna for FM IBOC transmission allows for robust performance with virtually no additional system losses, such as those losses that are characteristic of the 10 dB combining method. Performance characteristics of dual-input antenna systems will be presented. Two categories are considered: existing

single-input antennas previously optimized for only a single-input but that are retrofit for dual-input and newly constructed antennas that are optimized for both input ports.

**Presenter: ERIC WANDEL, ELECTRONICS RESEARCH, INC., CHANDLER, IN**

**11:00 AM**

### **AM HIGH DEFINITION RADIO-TECHNICAL ISSUES AFFECTING ADOPTION AT NIGHT**

This presentation explores the issues relating to the use of AM IBOC radio at night. The presentation details the complex interaction between the transmitted waveform, typical receiver response and the present population of nighttime facilities. Spectral plots, allocation maps and sample workups for specific stations will be included to illustrate the important issues.

**Presenter: GLEN CLARK, GLEN CLARK & ASSOCIATES, CRANBERRY TOWNSHIP, PA**

**11:30 AM**

### **IBOC TECHNICAL ACTIVITIES REPORT**

Since the FCC's historic *Report and Order* last October authorizing interim operation of AM and FM IBOC, there has been a tremendous amount of activity within the industry as it launches this new service. This presentation will highlight technical activities supported by the National Radio Systems Committee (NRSC), NAB, and others which have taken place since the interim authorization of this new service.

**Presenter: DAVID LAYER, NAB, WASHINGTON, DC**

**SUNDAY, APRIL 6, 2003 • 1:00 PM - 5:30 PM**

## **DTV CONVERSION ISSUES & SOLUTIONS - PART II**

**LAS VEGAS CONVENTION CENTER - ROOM N109**

**Chairperson: TED TEFFNER, WCAX-TV, BURLINGTON, VT**

**1:00 PM**

### **ANOTHER EXAMPLE OF SOFTWARE REPLACING HARDWARE: REAL-TIME SOFTWARE MPEG-2 SDI/HD ENCODING FOR DIGITAL TV BROADCASTING**

One critical component in DTV systems is the real-time MPEG-2 encoder, usually implemented with dedicated hardware. With the recent development in high performance CPUs, it becomes feasible to develop a software MPEG-2 SDI/HD encoder platform using near off-the-shelf components and customized software. This presentation describes a software prototype to encode MPEG-2 TS SD and HD video on a customized PC. The

price of the software system can be much more affordable, the software encoder produces better quality video and the flexibility of the software solution makes the system upgradeable to accommodate new coding technologies.

**Presenter: JAY KUO, INTERVIDEO, ARCADIA, CA**

**1:30 PM**

### **DISTRIBUTION AND ROUTING OF MULTIPLE AUDIO SERVICES IN DTV SYSTEMS**

A single DTV program stream can provide viewers with a wide choice of options, including simultaneous delivery of 5.1 audio in a main language, translation tracks video description or talking information services, weather and news. Supporting multiple audio services in DTV systems requires careful planning, and touches every link in the distribution chain. This presentation gives engineers and managers practical information based on real world experience.

**PRESENTERS: JEFFREY RIEDMILLER, DOLBY LABS, SAN FRANCISCO, CA; GERRY FIELD, CPB/WGBH NATIONAL CENTER FOR ACCESSIBLE MEDIA, BOSTON, MA**

**2:00 PM**

### **LONGLEY-RICE 101**

During the Digital Television (DTV) planning process the Longley-Rice propagation model was used extensively for predicting station coverage and potential interference. Although the Longley-Rice model has been and continues to be used extensively, most users have very little understanding of how the model arrives at a prediction. This presentation will endeavor to provide a better understanding of the basic inter-workings of the model and discuss how the model's predictions should be viewed in individual cases as well as its broader use as a planning tool.

**PRESENTER: WILLIAM MEINTEL, TECHWARE, INC., CHANTILLY, VA**

**2:30 PM**

### **BENEFITS OF NEXT-GENERATION REAL-TIME ADAPTIVE CORRECTION IN REAL-WORLD DIGITAL TELEVISION INSTALLATIONS**

New digital adaptive correction systems in digital Television exciters are finally living up to their early promise, addressing significant performance issues and overcoming traditional RF system constraints in real-world DTV installations while being easy to use for the day-to-day transmitter operator. This presentation will look at real-world installations where a next-generation linear and non-linear adaptive correction system is providing major advantages to broadcasters.

**Presenter: JOE SECCIA, HARRIS CORPORATION, MASON, OH**

**3:00 PM**

### **THE ANALOG CODER: HDTV DIGITAL TRANSMISSION OVER AN ANALOG MICROWAVE LINK**

The analog coder modulator/demodulator configuration is a compact, cost effective solution that allows transmission of a DTV signal plus a T1 data pack over existing analog microwave radios. The analog coder modulator modulates the 19.39 Mbps ATSC input and T1 data pack onto a 1Vp-p based signal that can be easily integrated to any analog microwave link. The analog coder demodulator receives and demodulates the baseband output from an analog receiver and outputs the 19.39 Mbps ATSC signal as well as the T1 data pack signals.

**Presenter: JOHN PAYNE, NUCOMM, INC., HACKETTSTOWN, NJ**

**3:30 PM**

### **THE RIGHT TIME**

The introduction of automation to the broadcast industry has exacerbated the problem because the automation system must coordinate the time and the video. Unfortunately, these two are often either running independently, or worse the automation system gets locked to the wrong time code. This presentation explains the the need to synchronize time and video; 30Hz time code; 29.97Fps SMPTE standard SMPTE time code; 29.97Fps SMPTE drop-frame time code; Real Time; UTC time; GPS time; Video time and timing; Synchronization of real time, video time and computer network time, using GPS and modem technologies.

**Presenter: DAVID STRACHAN, EVERTZ MICROSYSTEMS LTD., BURLINGTON, ONTARIO, CANADA**

**4:00 PM**

### **DOES OSD HAVE A ROLE TO PLAY IN THE BROADCAST AND MEDIA SPACE?**

The FCC mandate to go digital has forced broadcast stations to look at digital solutions and soon they will be grappling with a new problem as their digital data grows exponentially. Workflow enhancements and improvements, and reducing the operating costs will be key issues on the table for most people in the industry. This presentation explores the present and future roles of storage in meeting these objectives.

**Presenter: MOHAN MYSORE, CIPRICO INC., PLYMOUTH, MN**

**4:30 PM**

### **SAVE TIME AND MONEY: OPTIMIZING YOUR BROADCAST RF SYSTEM**

The RF broadcast system includes mechanical and electrical components such as antennas, transmission lines, combiners, filters, elbows, impedance matching

sections, transitions, structural hangers, thermal compensation and pressurization. Optimizing the entire RF system is key to maximizing its performance. This presentation will discuss why and how tests are performed and the equipment and personnel needed.

**Presenter: WALTER MAMAK, ANDREW CORPORATION, ORLAND PARK, IL**

**5:00 PM**

### **REAL LIFE EXPERIENCES IN COMMON-SITE MULTISTATION FM AND TV PROJECTS**

TV/FM analog upgrades and DTV/IBOC implementations have driven broadcasters to work together in many markets to develop a common-site solution. Often multiple TV and FM broadcasters are now involved. Implementations range from the selection of a single integrator whose responsibility is to coordinate the entire project to the broadcasters developing a "committee" to oversee several suppliers. This presentation describes several projects representative of these different methods of project management.

**Presenter: KERRY COZAD, DIELECTRIC COMMUNICATIONS, RAYMOND, ME**

**SUNDAY, APRIL 6, 2003 • 1:00 PM - 5:00 PM**

## **IBOC DAB - READY FOR PRIME TIME - PART II**

**LAS VEGAS CONVENTION CENTER - ROOM N111**

**Chairperson: JEFF LITTLEJOHN, CLEAR CHANNEL COMMUNICATIONS, COVINGTON, KY**

**1:00 PM**

### **PRACTICAL CONSIDERATIONS FOR THE IMPLEMENTATION OF AM IBOC**

This presentation discusses considerations for installing AM IBOC on an AM facility. It focuses on the implementation of AM IBOC at WOR (AM), New York City, and covers antenna system requirements, transmitter requirements, STL, installation, how to handle the IBOC audio delay and operational testing.

**Presenter: THOMAS RAY III, BUCKLEY BROADCASTING/WOR RADIO, NEW YORK, NY**

**1:30 PM**

### **A PLANNING GUIDE: DETERMINING THE BEST IBOC MIGRATION PATH FOR YOUR AM OR FM RADIO STATION**

Now that IBOC technology has been approved for interim use in the U.S., AM and FM broadcasters must determine the best implementation plan for their stations.

This presentation gives radio broadcasters a practical foundation for IBOC planning, whether they are planning to tackle the process with in-house staff or an outside consultant. A hands-on checklist that can be used as a starting point will be included.

**Presenter: KEITH MULLIN, HARRIS CORPORATION, QUINCY, IL**

**2:00 PM**

### **THE EFFECTS OF IMPLEMENTATION OF IBOC TRANSMISSIONS ON NIGHTTIME ANALOG RECEPTION AT NIGHT**

iBiquity Digital Corporation will deliver a presentation covering the studies and propagation studies of the present levels of analog interference and the changes that may occur following the full scale implementation of the HD Radio™ system. Included will be an overview of the existing AM nighttime conditions, the methodologies used in the field observation program, MOS testing program, and propagation studies. Results and conclusions will tie the propagation studies and field tests into a cohesive package depicting the present interference limited coverage of analog AM radio stations and changes that would occur when all stations convert to HD Radio.

**Presenter: GLYNN WALDEN, IBIQUITY DIGITAL CORPORATION, COLUMBIA, MD**

**2:30 PM**

### **IBOC SPACE DIVERSITY TEST**

Most FM IBOC tests, to date, have been performed using an IBOC signal emanating from the same antenna as its analog host using high-level or low-level combining. This presentation shows the effects of broadcasting the digital portion of the IBOC signal from a totally separate antenna. It includes tests needed to determine interference of the IBOC digital subcarriers to the host analog and vice versa.

**Presenter: TALMAGE BALL, BONNEVILLE INTERNATIONAL, SALT LAKE CITY, UT**

**3:00 PM**

### **SOLUTIONS FOR THE IMPLEMENTATION OF FM IBOC TECHNOLOGY**

Antennas, transmission lines and combiners are all components critical to a successful implementation of a digital FM transmission. This presentation is intended to summarize existing options for clarity to the engineers trying to decide what solution is optimal for their stations. A new concept in high level combining will also be presented that increases the efficiency of the transmission system (versus systems in use today) and subsequently allows for greater flexibility.

**Presenter: HENRY DOWNS, DIELECTRIC COMMUNICATIONS, RAYMOND, ME**





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World Radio History

MONDAY, APRIL 7, 2003 • 10:30 AM - 12:00 PM

## DIGITAL TELEVISION AROUND THE WORLD

LAS VEGAS CONVENTION CENTER - ROOM N109

Chairperson: **BILL NAPIER, BAHAKEL COMMUNICATIONS,  
CHARLOTTE, NC**

**10:30 AM**

### DIVERSITY RECEPTION OF DIGITAL TERRESTRIAL TELEVISION (DVB-T)

Using the European standard for digital terrestrial television, DVB-T, it is possible to achieve more robust reception by using more than one receiving antenna and combining the signals from the separate antennas. The improved reception that this technique offers can be used to increase transmission reliability to both portable television sets and to mobile televisions receivers. This presentation will outline the basic principles of implementing diversity reception in a COFDM receiver. It will also outline some tests and results of receiving DVB-T in a car using a diversity receiver carried out in London.

Presenter: **JUSTIN MITCHELL, BBC R&D, TADWORTH SURREY,  
UK**

**11:00 AM**

### MARKETING STRATEGIES FOR DIGITAL TERRESTRIAL BROADCASTING IN GERMANY

By the end of February 2003 terrestrial broadcasting in Berlin will be digital only. Viewers are thus forced to decide whether they want to buy a set-top box to keep on watching terrestrial or switch to cable or satellite. To achieve a smooth transition, broadcasters, industry, retail, and the broadcasting authorities formed a task force to plan marketing activities to convince those who use terrestrial antennas, as well as new target groups, of the advantages of DVB-T for portable indoor and mobile reception.

Presenter: **HEIKO ZYSK, PROSIEBENSAT.1 MEDIA AG,  
BERLIN, GERMANY**

**11:30 AM**

### DIGITAL HDTV RECEPTION IN JAPAN

This presentation discusses the present and future state of HDTV broadcasting reception in Japan. Topics include digital satellite services and terrestrial digital broadcasting. It includes an overview of HDTV receivers and discusses digital-satellite reception systems for domestic, community antenna and cable TV retransmission. NHK's activities and campaigns to promote HDTV reception are explained.

Presenter: **SATORU WAJIKI, NHK, TOKYO, JAPAN**

**3:30 PM**

### REDUCING FM IBOC TRANSMISSION COSTS WITH THE PROPER CONFIGURATION AND LINEARIZATION TECHNIQUES

This presentation examines how linearization techniques can maximize the power output and efficiency of FM IBOC transmitters while reducing operating costs. It looks at precorrection technology to optimize linearity. It also investigates the trade-off between capital investment and recurring costs including the costs of common and separate Amplification FM IBOC systems, their overall AC power consumption, and the demands placed on the facilities cooling systems.

Presenter: **GEORGE CABRERA, HARRIS CORPORATION, MASON,  
OH**

**4:00 PM**

### APPLYING THE PRINCIPLES OF DATA COMMUNICATIONS TO THE DEVELOPMENT OF AN OPEN AND UNIVERSAL IBOC DATA PROTOCOL

With the approaching standards for AM and FM IBOC technology, the radio industry has an opportunity to create a diverse, robust and vital data broadcasting service. This presentation lays out a strategy and rationale for establishing a universal and open data protocol that will support the services of all stakeholders in radio data broadcasting. The presentation reviews the similarities and differences among radio broadcasting and other data communications media. It takes a peek at the bandwidth and channelization characteristics of IBOC data to flesh out a set of design constraints for a universal protocol.

Presenter: **DAVID MAXSON, BROADCAST SIGNAL LAB LLP,  
MEDFIELD, MA**

**4:30 PM**

### DIGITAL RADIO CONCEPTS FOR SATELLITE AND TERRESTRIAL RECEPTION

This presentation will discuss the importance of the interoperable digital radio concept for satellite and terrestrial reception. While IBOC implementation is discussed at length, it also discusses digital radio adoption beyond IBOC implementation, including the market for digital radio, ensuring a smooth transition from analog FM/AM to digital radio (IBOC) and a single solution for multiple technologies.

Presenter: **JACK MORGAN, PHILIPS ELECTRONICS, FARMINGTON  
HILLS, MI**

MONDAY, APRIL 7, 2003 • 10:30 AM - 12:00 PM

## **INTERNATIONAL BROADCAST DEVELOPMENTS**

LAS VEGAS CONVENTION CENTER - ROOM N111

Chairperson: DON MESSER, IBB, WASHINGTON, DC

**10:30 AM**

### **BROADCAST ENGINEERING BEHIND THE LIFTED IRON CURTAIN**

Developments in private and public TV broadcast stations in Central and Eastern Europe. Current state of broadcast technology, its historical background and possible future developments.

**Presenter: MARTIN JUNEK, ABEX SOCIETY, PRAGUE, CZECH  
REPUBLIC**

**11:00 AM**

### **DIGITAL RADIO MONDIALE: FEATURES AND REQUIREMENTS FROM A BROADCASTER'S PERSPECTIVE**

The year 2003 sees the official launch of Digital Radio Mondiale (DRM), the new broadcast system for shortwave, mediumwave and long-wave. DRM offers a long list of enhancements and new features that broadcasters should be aware of. The presentation outlines DRM from the perspective of broadcasters who are considering introducing DRM services or switching their analog transmissions to digital.

**Presenter: ANDY GIEFER & SIMON GOSBY, BBC WORLD  
SERVICE, LONDON, UK**

**11:30 AM**

### **NETWORKED SYSTEMS IN THE SPHERE OF PUBLIC AND PRIVATE BROADCASTING**

Networked system approaches and convergent architectures are being used more and more frequently in the broadcasting industry. The trend is towards networked systems, which aside from the purely technical connection are also pushing the networking of processes to the fore. This phase has more or less been successfully completed in radio broadcasting but has only just begun in television. This presentation outlines the key steps on the road to creating a fully digital broadcasting center.

**Presenter: PETER KOENIG & MANFRED HERMANN, T-SYSTEMS  
INTERNATIONAL, HAMBURG, GERMANY**

MONDAY, APRIL 7, 2003 • 1:00 PM - 5:30 PM

## **DIGITAL STORAGE AND ASSET MANAGEMENT FOR BROADCAST CONTENT**

LAS VEGAS CONVENTION CENTER - ROOM N111

Chairperson: THOMAS WEBER, WISH-TV, INDIANAPOLIS, IN

1:00 PM

### **EVALUATING NAS PERFORMANCE FOR AUDIO AND VIDEO APPLICATIONS**

Many new storage solutions promise improvement in some combination of capacity in performance manageability, ROI, TCO throughput, or latency. Not one of them addresses all of the current issues facing storage administrators today. This presentation discusses the requirements for a new storage architecture that addresses all the above challenges. It outlines that architecture and summarizes the benefits to be gained.

Presenter: JEFF HORNUNG, SPINNAKER NETWORKS,  
PITTSBURGH, PA

1:30 PM

### **MEDIA ASSET MANAGEMENT FOR BROADCAST NEWS: INTEGRATED WORKFLOW MANAGEMENT**

This presentation focuses on cost effective Media Asset Management for news production. An effective solution can reduce staff costs by as much as 30% while greatly increasing productivity and the amount of material produced. The presentation includes a case study on the implementation of a digital media asset management system and an overview of different types of approaches.

Presenter: ANNA MAE SOKUSKY, DDMS USA, NEW YORK, NY

2:00 PM

### **MEDIA ASSET MANAGEMENT: REQUIREMENTS PLANNING FOR DEPLOYMENT OF A SCALABLE DIGITAL ASSET MANAGEMENT SYSTEM**

A media asset management system can provide significant benefits to content owners and distributors. Reaping those benefits required careful planning to identify the business objectives of the content owner and the means to monetize the perceived benefits. This presentation identifies a solution agnostic, systematic method to successfully plan and deploy a comprehensive media asset management solution.

Presenter: ROBERT SLUTSKE & BILL HARRIS, NATIONAL  
TELECONSULTANTS, INC., GLENDALE, CA

**2:30 PM**

## **MEDIA ASSET MANAGEMENT PLATFORM- METACONCIERGE**

This presentation introduces a media asset management platform called "MetaConcierge" that allows users to retrieve desired contents from large video databases easily and quickly. It supports metadata video contents. The metadata model complies with the TV-Anytime specification. An experimental movie guide portal "Movie Circus" will be shown.

**Presenter: AKIRA KOJIMA, NIPPON TELEGRAPH AND  
TELEPHONE CORP, KANAGAWA, JAPAN**

**3:00 PM**

## **INTEGRATE LEGACY CONTENT STORES TO INCREASE RETURN ON CONTENT INVESTMENTS**

Increasing return on content investments means generating more revenue from all aspects of content usage. When content stores are integrated, users in multiple departments can identify and use content assets quickly and efficiently. This presentation provides an overview of various approaches to integrating disparate legacy content systems, as well as the benefits, tradeoffs and issues to consider when planning an integration.

**Presenter: DENNIS CRANE, AGARI MEDIAWARE, INC.,  
HERNDON, VA**

**3:30 PM**

## **A UNIFIED SOLUTION FOR THE INTEGRATION OF MEDIA APPLICATIONS AND PRODUCTS IN BROADCASTER ENVIRONMENTS - THE ASSET ARCHITECTURE**

The introduction of IT concepts and technologies has opened the possibility for new approaches for implementation of digital television facilities covering the whole workflow: acquisition, creation, editing, control, storage, broadcasting, publishing and archiving. ASSET a European funded project is defining and developing a software architecture that will be made available to manufacturers for allowing easy interfacing between digital television equipment and applications.

**Presenter: MARIO CORDEIRO, INESC PORTO, PORTO,  
PORTUGAL**

**4:00 PM**

## **RETRIEVING VIDEO SEGMENTS BASED ON COMBINED TEXT, SPEECH AND IMAGE**

This presentation describes CIMWOS, a multimedia, multimodal and multilingual system addressing the issue of intelligent indexing and retrieval of audiovisual material. The system uses a dual audio and visual approach to

locate important segments within multimedia material employing state-of-the-art algorithms for text, speech and image processing.

**Presenter: THOMAS NETOUSEK, SAIL LABS TECHNOLOGY AG, VIENNA, AUSTRIA**

**4:30 PM**

### **INTERACTIVE TELEVISION NEWS SERVICES – THE BEGINNING OF THE U.K. REVOLUTION**

BBC News has been part of a push by the BBC to pioneer the introduction of Interactive Television services in the U.K. Although the initial focus has been on Digital Satellite services, the project has included the migration of these applications onto Digital Cable, Digital Terrestrial, Broadband to TV, Broadband to PC, and existing Internet services. The presentation describes some of the services and processes involved, and gives an insight into the organization and management of content, resources and applications across multiple platforms.

**Presenter: RUSSELL MERRYMAN AND CLIFF WOOTTON, BBC NEWS (iTV), LONDON, U.K.**

**5:00 PM**

### **NEWS SHARING SYSTEM APPLICATION IN CHINA CENTRAL TELEVISION**

China Central Television (CCTV) established the News Sharing System in August 2002. This system was designed based on the concept of Object-oriented (OO) and Content-oriented (CO) process and integrated by the means of such as FC Fabric/SAN and Gb Ethernet infrastructure to support dual resolution news editing, full MPEG-2@25Mbps IBP operation saving the investment by half, low-resolution proxy operation to realize virtual news production workflow and user friendly interface making the jobs convenient and efficient.

**Presenter: WENHUA DING, CHINA CENTRAL TELEVISION (CCTV), BEIJING, CHINA**

**MONDAY, APRIL 7, 2003 • 1:00 PM - 6:00 PM**

## **MPEG - ENABLING BROADCAST AND MEDIA**

**LAS VEGAS CONVENTION CENTER - ROOM N109**

The world of television and motion pictures changed forever in the 1990s with the introduction of digital technologies. From shrinking movies so that they fit on CDs and enabling cable television to get to 100s of channels, to the biggest success story ever in consumer electronics when DVD outgrew VHS and the emergence of Digital Cinema, MPEG has played the enabling role. Through technology for representing multimedia content digitally,

and more recently for rich metadata and supporting technology, including rights management, MPEG is also changing the convergence marketplace for the next generation of interactive TV, wireless and media applications.

This session will begin with an overview of the MPEG family of standards, from MPEG 1 to MPEG-21. It will then focus on the recently introduced MPEG-4, highlighting the applications it enables, both now and into the future. This session includes a combination of keynotes from industry-leading MPEG personalities and users, as well as lively panel discussions. Co-sponsored by MPEG-4 Industry Forum (M4IF) and Society of Motion Picture and Television Engineers (SMPTE).

**MODERATOR: BRANE ZIVKOVIC, SOUNDBALL, INC., NEW YORK, NY; CO-CHAIRPERSON: RICHARD MIZER, CINEVENTS, SAN FRANCISCO, CA; CO-CHAIRPERSON: ROB KOENEN, INTERTRUST TECHNOLOGIES, SANTA CLARA, CA**

**1:00 PM**

**Keynote: LEONARDO CHIARIGLIONE, TELECOM ITALIA LAB, TORINO, ITALY**

**1:30 PM**

**OVERVIEW OF THE  
MPEG FAMILY OF STANDARDS**

**Moderator: BRANE ZIVKOVIC, SOUNDBALL, NEW YORK, NY**

**MPEG BUSINESS/TECHNICAL OVERVIEW:  
MPEG-1 THROUGH MPEG-21:  
INTEROPERABILITY AS THE DRIVING FORCE**

**PRESENTER: ROB KOENEN, INTERTRUST TECHNOLOGIES CORPORATION, SANTA CLARA, CA**

**EVOLUTION OF MPEG VIDEO, FROM MPEG-1  
TO MPEG-4 ADVANCED VIDEO CODING/H.264**

**PRESENTER: GARY SULLIVAN, MICROSOFT CORPORATION**

**EVOLUTION OF MPEG AUDIO FROM MP3 TO  
HIGH EFFICIENCY AAC**

**Presenter: DAVID FRERICHS, CODING TECHNOLOGIES, MOUNTAIN VIEW, CA**

**MPEG-7 MEDIA CONTENT APPLICATIONS**

**Presenter: JOHN SMITH, IBM, WHITE PLAINS, NY**

**2:30 PM**

**MPEG - 4 TECHNOLOGIES**

**Moderator: KLAUS DIEPOLD, TECHNISCHE UNIVERSITAT MUNCHEN, MUNICH, GERMANY**

## **FROM CHIPS TO CODECS - MPEG HARDWARE IMPLEMENTATION**

Presenter: DIDIER LEGALL, LSI LOGIC, MILPITAS, CA

## **AUTHORING TOOLS FOR MPEG-4 BROADCAST APPLICATIONS**

Presenter: MARTY LEVINE, IVAST, SANTA CLARA,

## **MPEG-4 STREAMING CONTENT CASE STUDY**

Presenter: JULIE DUTRISIAC, NATIONAL FILM BOARD OF CANADA

3:30 PM

## **PRIME MPEG USER KEYNOTE**

Presenter: ALAN BELL, WARNER BROS

4:00 PM

## **EXECUTIVE PANEL DISCUSSION - REAL WORLD MPEG-4 APPLICATIONS**

Moderator: J. SPIERER, DISTANCEVISION INC

Presenter: LARRY HORN, MPEG-LA

## **MPEG-2-4 TRANSITION**

Presenter: SEBASTIAN MOERITZ, DICAS GMBH

## **MPEG-4 FOR FILMS**

TUESDAY, APRIL 8, 2003 • 9:00 AM-12:00 PM

## **IMPLEMENTING PSIP AND METADATA**

LAS VEGAS CONVENTION CENTER - ROOM N109

Chairperson: ART ALLISON, NAB, WASHINGTON, DC

9:00 AM

## **MAKING IT ALL WORK (AND YOU WONDER WHY WE HAVE GRAY HAIR?)**

Now that you're on the air, how do you make sure all your content gets to all your viewers? Issues include remixing network feeds, adding local channels, up converting to high definition, second language programming, video, data, closed captioning and dynamic PSIP generation. Then feed a digital microwave or fiber system for distribution. Transmit it on your DTV station or stations, remapping the TVCT. This presentation gives engineers and managers practical advice from the field.

Presenter: GIL MAXWELL, MAINE PUBLIC BROADCASTING, BANGOR, ME; GERRY FIELD, CPB/WGBH NATIONAL CENTER FOR ACCESSIBLE MEDIA, BOSTON, MA



**9:30 AM**

## **SENDING CONSISTENT, ACCURATE AND UP-TO-DATE PSIP DATA**

PSIP (Program and System Information Protocol) provides tuning, branding and program guide information to DTV receivers. One of the most frequent causes of reception problems is inaccurate PSIP data. Automating the data input to a PSIP generator is a challenge because the information may come from multiple sources that conflict with one another. In this presentation, we explore the information needed by a PSIP generator, analyze where this data may come from and look at how the whole system can be fully automated.

**Presenter: FRED GRENIER, THALES BROADCAST & MULTIMEDIA, ALEXANDRIA, VA**

**10:00 AM**

## **GRAPHICAL APPROACH TO PSIP CONSISTENCY CHECKING**

DTV broadcast streams must contain certain MPEG-2 Program Specific Information (PSI) tables and certain Program and System Information Protocol (PSIP) tables required by the ATSC standard (or Service Information (SI) tables required DVB). If these tables are missing, or are inconsistent with each other, some DTV receivers may misbehave badly. This presentation describes a graphical approach to showing interrelationships of PSIP tables and highlights inconsistencies.

**Presenter: JAMES GUPTA, GOMER THOMAS, TRIVENI DIGITAL, INC., PRINCETON JUNCTION, NJ**

**10:30 AM**

## **METADATA EXCHANGE AMONG BROADCAST SYSTEMS**

Broadcasters are seeking ways to reduce expenses by increasing efficiency of operations. One approach is centralization. The increased digitalization of broadcasting operations lends itself to the exchange of metadata among many systems including automation, traffic, program management, spot delivery and PSIP, with reduction in manual effort. Many of these already perform a limited amount of metadata exchange, but what we see today is just the tip of the iceberg. This presentation will discuss some of the trends and where this is leading.

**Presenter: CHRISTOPHER LENNON, ENCODA SYSTEMS, COLORADO SPRINGS, CO**

**11:00 AM**

## **METADATA CARRIAGE IN DIGITAL TELEVISION**

Metadata has always been an important aspect of broadcast television operations. In DTV broadcasting, metadata assumes even greater importance. The

increased complexity of the DTV signal requires that more information be made available to the receiver in order to fully present the television programming and enhanced capabilities to the viewer. Work is underway within the ATSC to define the carriage of metadata in an ATSC emission stream. Special attention is being paid to the interface between the emission domain and the production domain. This presentation will summarize this activity.

**Presenter: RICHARD CHERNOCK, TRIVENI DIGITAL, PRINCETON JUNCTION, NJ**

**11:30 AM**

### **AUDIO WATERMARKING FOR AUDIENCE MEASUREMENT**

The rollout of digital television renders certain audience measurement techniques obsolete. In order to properly identify each program source in the digital world an audio watermark will be added at every program output chain. This presentation details the operation of the watermarking equipment and technical implications this has on broadcast operations. It includes information on cost, how the watermarking fits into the overall audience measurement system, and placement in broadcast facilities.

**Presenter: PAUL KEMPTER, NIELSEN MEDIA RESEARCH, DUNEDIN, FL**

**TUESDAY, APRIL 8, 2003 • 9:00 AM - 12:00 PM**

## **RADIO TRANSMISSION FORUM**

**LAS VEGAS CONVENTION CENTER - ROOM N111**

**Chairperson: ANDY LAIRD, JOURNAL BROADCAST GROUP, INC., MILWAUKEE, WI**

**9:00 AM**

### **A CASE STUDY IN EVENT FREQUENCY COORDINATION: 2002 OLYMPIC WINTER GAMES**

This presentation provides a review of the challenges of frequency coordination for large-scale events, including the 2002 Olympic Games, 2000 Political Conventions and 2001 Presidential Inauguration. Topics covered include case studies in event coordination, the FCC and event frequency coordination, technology and event frequency coordination, and the future of event coordination.

**Presenter: MARIO HIEB, CONSULTANT, SALT LAKE CITY, UT**

**9:30 AM**

### **SEATTLE'S KKOL GOES MARITIME MOBILE**

On January 1, 2002, KKOL, 1300 kHz, began operating from temporary facilities aboard the 175 foot cargo ship, the Coastal Ranger, in Seattle's Elliott Bay. This 1000 watt transmitter facility is the only licensed broadcast station operating in the United States aboard a ship. This presentation describes the circumstances for this unusual transmitter facility, how the project was implemented and the unexpected efficient performance.

**Presenter: JAMES DALKE, CONSULTING ENGINEER, SEATTLE, WA**

**10:00 AM**

### **ADVANCED MODULATION SYSTEM**

An Advanced Modulation system for analog AM radio broadcasting will be presented.

**Presenter: MICHAEL DORROUGH, DORROUGH ELECTRONICS, WOODLAND HILLS, CA**

**10:30 AM**

### **APPLICATION OF THE CHEBYSHEV QUARTER-WAVE IMPEDANCE MATCHING TRANSFORMERS TO SHORTWAVE BROADCASTING**

International broadcasting presents a unique situation in that it consists of many distinct bands separated by large regions of unused space. The Chebyshev transformer takes advantage of this fact by placing the best possible match within the required shortwave bands. The performance of the binomial or "maximum-flatness" matching network is compared to that of the Chebyshev or "equal-ripple" network for multiband shortwave broadcasting. By tolerating a modest mismatch within the passband, a greater overall usable bandwidth can be obtained.

**Presenter: ERNIE FRANKE, HCJB WORLD RADIO, QUITO, ECUADOR**

**11:00 AM**

### **TESTING AND RESULTS OF A NEW, EFFICIENT LOW-PROFILE AM MEDIUM FREQUENCY ANTENNA SYSTEM**

This presentation presents the results of a testing program of a new, more efficient low-profile AM antenna. The concept of the new antenna, which is only approximately one-fourth the height of a 90 degree monopole, yet is 92% as efficient in achieving the unattenuated field, will be introduced. The results of the field testing comparing the antenna's performance to that of a quarterwave monopole will also be presented.

**Presenter: MICHAEL JACOBS, STAR-H CORPORATION, STATE COLLEGE, PA**

**11:30 AM**

## **CARE AND FEEDING OF FM MULTICHANNEL ANTENNAS**

The design of high power, multichannel antennas has been through several evolutions in the last 15 years. Whether the antenna is a panel or top-mounted pole type, long term, consistent performance requires expertise in the assembly and testing at the factory and during field installation. This presentation describes the various antenna designs and provides guidelines for the testing needed to assure expected performance at sign on.

**Presenter: WILLIAM KERKHOFF, DIELECTRIC COMMUNICATIONS, PALMYRA, MO**

**TUESDAY, APRIL 8, 2003 • 1:00 PM - 5:00 PM**

## **DTV RECEPTION AND ENHANCEMENTS**

**LAS VEGAS CONVENTION CENTER - ROOM N109**

**Chairperson: JEFF ANDREW, GANNETT BROADCASTING, WASHINGTON, DC**

**1:00 PM**

## **DTV RECEPTION FOR THE IBLAST DATACASTING NETWORK**

A data broadcasting service has been launched in eight cities by iBlast. This involves data transmission to PC's equipped with a DTV tuner, and presents the opportunity for each receiver to log variations in signal strength and packet loss over extended periods of time. This presentation will look at the real-life experience in predicted versus actual signal coverage, and present findings from the first six months of receiver deployment.

**Presenter: PETE LUDE, IBLAST, BEVERLY HILLS, CA**

**1:30 PM**

## **MINIMUM TARGET PERFORMANCE FOR DIGITAL TELEVISION BROADCAST RECEIVERS**

The Advanced Television Technology Center has recognized the need for improving DTV reception and has developed a minimum set of performance targets for the terrestrial broadcast receiver. These targets originate from various sources including the FCC rules and Planning Factors used to establish the DTV channel allotments. This presentation discusses current performance limitations in DTV receivers and details specific targets to ensure reliable operation in DTV systems.

**Presenter: CHARLES EINOLF, ADVANCED TELEVISION TECHNOLOGY CENTER, ALEXANDRIA, VA**

**2:00 PM**

### **LINX RECEIVER FIELD TESTS**

An extensive field test of the LINX DTV receiver will be conducted by MSTV starting in February. The test is intended to verify the reception benefits provided by the LINX receiver. This presentation will summarize the results of these tests.

**Presenters: VICTOR TAWIL, ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC., WASHINGTON, DC; RICHARD CITTA, LINX ELECTRONICS, PALATINE, IL**

**2:30 PM**

### **DISTRIBUTED TRANSMISSION SYSTEMS OVERCOMING THE LIMITATIONS OF DTV TRANSMISSION**

Delivering adequate signal levels in places that are distant or blocked from a single, high power transmitter can be accomplished using a Distributed Transmission (DX) network. At the same time, the use of lower power transmitters distributed through the service area can reduce interference to neighbors. The presentation will delve into the requirements for DX, distinguishing it from the use of Digital On-Channel Repeaters. It will look at the state of approval of the necessary documents and rules that will enable DX implementation and will discuss the first DX system to be built and tested.

**Presenter: S. MERRILL WEISS, MERRILL WEISS GROUP, LLC, METUCHEN, NJ**

**3:00 PM**

### **IMPLEMENTATION OF THE ATSC DISTRIBUTED TRANSMISSION SYSTEM**

The ATSC is developing a standard for distributed transmission (DX) that uses multiple synchronized transmitters on the same channel to form a single frequency network. DX may be used to cover areas with difficult terrain, or as gap fillers to augment coverage. This technology may also be used in lieu of the traditional approach of operating a single high power transmitter. WPSX-DT in State College, Pennsylvania is the first station to implement a distributed transmission network (DXN). Several new pieces of hardware were required—a distributed transmission adaptor (DXA) and slave transmitters to receive and apply the data generated by the DXA.

**Presenter: DAVID HERSHBERGER, AXCERA, GRASS VALLEY, CA**

**3:30 PM**

**FIELD TEST RESULTS OF AN ATSC 8-VSB PROTOTYPE RECEIVER IN A DISTRIBUTED TRANSMISSION ENVIRONMENT**

This presentation presents the design, implementation and field test results for an ATSC 8-VSB prototype receiver that is designed for indoor and distributed transmission environments. The receiver is designed to handle severe multipath distortion found indoor or created under Single Frequency Network (SFN) transmission conditions.

**Presenter: YIYAN WU, COMMUNICATIONS RESEARCH CENTRE CANADA, OTTAWA, CANADA**

**4:00 PM**

**ATSC HDTV CARRIAGE OVER DIGITAL CABLE: A PERSPECTIVE FOR BROADCASTERS**

This presentation explores the issues involving carriage of ATSC digital television signals over digital cable. It describes digital cable architecture and how broadcast DTV is carried over digital cable. In-depth discussion is given on trade-off of high quality low bit rate HD encoding versus rate shaping technology for cable carriage. Observations and recommendations are presented for implementing cable carriage of broadcast DTV signals.

**Presenters: Michael Guthrie & Bill Zou, Harmonic Inc., Sunnyvale, CA**

**4:30 PM**

**FIFTH GENERATION VSB RECEIVER FIELD TEST REPORT**

VSB receiver chipset design has progressed through several generations of both algorithm improvement and functional integration. As part of the research on VSB receivers, much effort has been concentrated on the channel equalizer, which has no counterpart in analog design. Innovative channel equalization techniques to overcome urban environment ghost conditions have been developed for a fifth-generation chipset, and the concepts have been realized in a prototype and tested in Washington, DC and other urban areas. Results are presented and compared to earlier-generation conventional techniques.

**Presenter: WAYNE BRETL, ZENITH ELECTRONICS CORP, LINCOLNSHIRE, IL**

TUESDAY, APRIL 8, 2003 • 1:00 PM - 5:30 PM

## **RADIO AUDIO FORUM**

LAS VEGAS CONVENTION CENTER - ROOM N111

Chairperson: **ANDY LAIRD**, JOURNAL BROADCAST GROUP, INC.,  
MILWAUKEE, WI

**1:00 PM**

### **WILL IBOC/DAB/HD RADIO DELIVER ALL THAT'S PROMISED?**

This presentation addresses the improvements of digital radio compared to existing FM technology. By investigating the features of increased ancillary data, reduced signal fading and bandwidth improvement the presentation outlines if listeners are to receive the optimum return from the new services. In particular to be investigated are the type, number, parameters, sampling frequencies and data rates of the audio data compression algorithms that are implemented in a typical broadcast chain prior to digital emission.

**Presenter: SIMON FACTOR**, AUDIO PROCESSING TECHNOLOGY,  
BELFAST, NORTHERN IRELAND

**1:30 PM**

### **MAXIMIZING UNTAPPED INFORMATION ASSETS: THE CASE FOR AUDIO SEARCH AND RETRIEVAL**

Corporate video, voice mail messages, broadcast ads, call centers, and all types of multimedia represent a valuable and growing corporate information asset. Unless companies can search and retrieve this information this resource goes to waste. This presentation introduces the concept of audio search, explains how it works, and, most importantly, how organizations are using it to maximize the value of audio information that previously has been difficult to find and access.

**Presenter: ARMISTEAD WHITNEY**, FAST TALK COMMUNICATIONS,  
ATLANTA, GA

**2:00 PM**

### **AACPLUS-HIGHEST EFFICIENT AUDIO CODING FOR BROADCAST APPLICATIONS**

The combination of Advanced Audio Coding (AAC) and SBR as a bandwidth extension tool is in the final standardization phase within MPEG-4. aacPlus allows high-quality stereo audio at bit rates of 40 kbps or even lower. The main applications are digital broadcasting and mobile applications, where cost and/or physical restrictions require highest compression efficiency.

**Presenter: STEFAN MELTZER**, CODING TECHNOLOGIES,  
NURNBERG, GERMANY

**2:30 PM**

## **ETHERNET FOR STUDIO AUDIO SYSTEMS**

Radio stations are near universally using PCs to play and edit audio. Most of these are interconnected via Ethernet LANs for file transfers. Can we extend the use of Ethernet to include live audio? Ethernet is a potentially powerful new audio medium: 25 or more bi-directional stereo channels can be carried on a single 100BASE-T link. Ethernet's power has grown tremendously over the past decade, and appropriate technology can now enable it to provide the quality-of-service and low delay needed for broadcast audio applications.

**Presenter: STEVE CHURCH, TELOS SYSTEMS, CLEVELAND, OH**

**3:00 PM**

## **RADIO PRODUCTION: BEYOND THE DIGITAL EDITOR**

New tools and software originally intended for music and pro audio production are finding their way into spots, promos and station imaging. This presentation will explain the innovative techniques and products that production directors can use to set their work above the rest of the market.

**Presenter: ALAN PETERSON, MONTGOMERY COLLEGE, ROCKVILLE, MD**

**3:30 PM**

## **DON'T RE-INVENT THE WHEEL, FIND A DIFFERENT SPOKE**

Limited budgets often times require an engineer to get creative when designing new station facilities. Typically, a product designed specifically for use in radio broadcasting can be expensive when compared to its consumer counterpart. This presentation discusses using existing technologies that are found in industries other than broadcasting that may be readily adopted for the radio market.

**Presenter: RICK KEMP, JOURNAL BROADCAST GROUP, BOISE, ID**

**4:00 PM**

## **RELIABILITY AND REDUNDANCY IN LINEARLY EXPANDABLE ROUTERS**

Broadcast routers are at the very heart of the broadcast facility. A router failure has the possibility of resulting in loss of a program or worse, loss of a commercial. This presentation focuses on reliability issues from several perspectives including system architecture, possible sources of errors, complexity, parts count, forward error correction, and placement of redundancy decision points.

**Presenter: CARL CHRISTENSEN, THOMSON GRASS VALLEY, SALT LAKE CITY, UT**



**4:30 PM**

## **A NETWORK-ENABLED RADIO CONSOLE ARCHITECTURE**

While audio console architecture has remained basically unchanged for more than 30 years, the PC has been changing everything around it. Broadcasters are using personal computers to replace many studio functions particularly audio source equipment. We propose a network-based console architecture more suitable for the modern broadcast studio. This approach promises to be lower in cost than traditional consoles while providing a fully networked, scalable and extremely powerful studio audio system.

Presenter: **MICHAEL DOSCH, TELOS SYSTEMS, CLEVELAND, OH**

**5:00 PM**

## **UNDERSTANDING AND AVOIDING "GROUND LOOP" PROBLEMS**

Many audio and video professionals think of system grounding as a black art. The most basic rules of physics are routinely overlooked, ignored, or forgotten. This presentation is intended to enable sound and video engineers to understand and avoid or solve real world noise problems.

Presenter: **BILL WHITLOCK, JENSEN TRANSFORMERS, INC., VAN NUYS, CA**

**WEDNESDAY, APRIL 9, 2003 • 8:00 AM - 11:30 AM**

## **TECHNOLOGY BASED BROADCAST SERVICES**

**LAS VEGAS CONVENTION CENTER - ROOM N109**

CHAIRPERSON: **JEFF LITTLEJOHN, CLEAR CHANNEL COMMUNICATIONS, COVINGTON, KY**

**8:00 AM**

## **HOLOGRAPHIC DATA STORAGE: THE TECHNOLOGY FOR NEXT GENERATION REMOVABLE BROADCAST MEDIA**

The gains made in holographic data storage will, in the next 3-5 years, enable broadcast and production professionals to capture, edit, duplicate, and archive video on removable media that has a 100-year life cycle with no degradation and no piracy issues. In this presentation, we will detail the overall value of holographic data storage and its various characteristics for integration into new hybrid products, such as disk cameras, as well as the workflow issues associated with the first ideal optical medium for HDTV.

Presenter: **WILLIAM WILSON, INPHASE TECHNOLOGIES, LONGMONT, CO**

**8:30 AM**

## **BROADCASTING THE THEATRE EXPERIENCE TO THE HOME**

Broadcasters have been steadily improving the quality of their signals. Substantial improvements have already occurred with the video signal. To better preserve video quality, the broadcaster has converted his facility from composite analog to digital video to HDTV (within the United States). The fundamental challenge is to upgrade their existing infrastructure to be able to transport and transmit multichannel surround signals. This presentation will examine the technical requirements for the transport of audio surround sound signals in both contribution and distribution systems.

**Presenter: MICHAEL STEEL, LEITCH TECHNOLOGY INC., TORONTO, ONTARIO, CANADA**

**9:00 AM**

## **BROADCASTING AND HIGH-BANDWIDTH NETWORK APPLICATIONS**

This presentation describes several experiments and demonstrations of high bandwidth networking that enable the convergence of broadcasting and computing. Advanced networks and next generation Internet2 are part of these high bandwidth applications. The presentation discusses a video on-demand interface for HD and MPEG-2 playback, an HD desktop client featuring ATSC 19.1 Mbps HD and high-quality media delivery using high speed networks. It includes a description of varied content delivery applications for enhanced listener/viewer experiences and discusses where we are going with all this in radio and TV operations and media archive search.

**Presenter: MICHAEL WELLINGS, RESEARCH CHANNEL, SEATTLE, WA**

**9:30 AM**

## **TECHNICAL AND REGULATORY CHANGES IN THE AUXILIARY BROADCAST AND CARS SERVICES**

In May 2002 the FCC released a *Report and Order* expanding the class of eligible licensees in the 12 GHz Cable Television Relay Service (CARS) band. Subsequently, in November 2002 a separate *Report and Order* was released which detailed major changes for Auxiliary Broadcast users (including the use of Digital Modulation and Conditional Authorization) and provides consolidation of some of the rules for Broadcast Auxiliary, CARS and Fixed services. This presentation will explore the nature of these rule changes, why they were proposed, implemented and the impact that it will have on the broadcast industry.

**Presenter: CHRIS HARDY, COMSEARCH, ASHBURN, VA**

**10:00 AM**

**DIGITAL VIEW: AN UPDATE ON INTEROPERABILITY STANDARDS FOR INTERACTIVE TELEVISION**

The development of interactive television is an important step in realizing the potential for television in the digital age. However, given the differences between emerging standards on an international basis, and the reality of a large installed base of legacy solutions the challenge of achieving interoperability has become a topic of concern. This presentation reviews perspectives of interoperability and offers observations about the importance of content authoring.

**Presenter: TONY FAUSTINI, MICROSOFT CORPORATION, WELLESLEY, MA**

**10:30 AM**

**TV-ANYTIME COMPLETED ITS FIRST SPECIFICATION PHASE IN NOVEMBER 2002**

The TV-Anytime metadata specification represents a decisive step forward for the development of new services taking benefit of the market deployment of Personal Digital Recorders (PDRs). The TV-Anytime metadata specification defines a complete set of metadata schemes for describing content. It also largely uses the MPEG-7 user preferences and viewing habits schemes. This allows supporting human and automatic content filtering, interactive bi-directional searching, and targeting. This presentation provides an introduction to the TV-Anytime metadata specification and includes issues related to the production and management of business-to-consumer metadata.

**Presenter: JEAN-PIERRE EVAIN, EBU, GENEVA, SWITZERLAND**

**11:00 AM**

**A HOMELAND SECURITY SOLUTION UTILIZING ATSC DATACASTING**

This presentation discusses a homeland security system that uses ATSC digital terrestrial broadcasts to provide emergency information. This information can be targeted to specific groups or individual receivers or it can be disseminated to the public. Emergency alerts, such as those from the local Fire Department or Police Department and local emergency managers, can be routed to known secondary information providers. A national deployment and operation will be detailed.

**Presenter: TOM RUCKTENWALD, NDS AMERICAS, NEW YORK, NY**

WEDNESDAY, APRIL 9, 2003 • 12:00 PM - 1:45 PM

## TECHNOLOGY LUNCHEON

LAS VEGAS HILTON - BARRON ROOM

George Gilder, futurist, author and chairman of Gilder Group, Inc., will address NAB2003 attendees at the Technology Luncheon. In his best selling book, *Microcosm* (1989), Gilder explored the roots of the new electronic technologies. Gilder's *Life After*



*Television* prophesied the future of computers and telecommunications. His latest book, *Telecosm: How Infinite Bandwidth Will Revolutionize Our World*, expands on his theories from *Life After Television* and explores the exponential growth in communications technology, supplanting computers as the engine of world economic growth

**Keynote: GEORGE GILDER, GILDER GROUP, INC., TYRINGHAM, MA**

## Radio Engineering Achievement Award Winner



John Reiser retired in 2000 as a senior broadcast engineer with the FCC's International Bureau. He played a significant role in many landmark rulings during his 39 years at the FCC including the standardization of the FCC national program for broadcast station inspections in the 1970s, the 1976 revision of the broadcast rules and

regulations and the reorganization of the Broadcast Bureau into what is now the Media Bureau.

From 1986-2000, he served as the U.S. chairman of the technical study groups on broadcasting that participate in the standards and conference preparatory work of the International Telecommunications Union and represented the U.S. at numerous international meetings on broadcasting issues. For many years, his extensive knowledge of the FCC rules and hands-on experience and day-to-day contact with broadcast stations made him a critical resource to the industry in helping broadcasters comply with the FCC rules.

**JOHN REISER, FCC (RETIRED), MOUNT VERNON, VA**

## Television Engineering Achievement Award Winner

Robert Eckert is the Branch Chief-Electromagnetic Compatibility Division, Technical Analysis Branch of the Office of Engineering and Technology at the Federal Communications Commission (FCC). He began his career with the FCC in 1980, specializing in matters relating to radio propagation prediction, spectrum efficiency, and frequency-assignment algorithms.



For the past fifteen years, his work at the FCC has been devoted to spectrum planning for advanced television. He investigated ways to assign digital TV channels within the current TV broadcast bands and constructed computer programs to evaluate the coverage and interference consequences of various digital TV (DTV) channel allotment tables. He was one of the principal architects of the original DTV channel allotment plan, and developed and implemented the FCC's channel selection algorithms that accommodated all television stations with a DTV channel assignment. His significant technical accomplishments have been instrumental in facilitating the DTV transition for the broadcast television service.

**ROBERT ECKERT, FCC, WASHINGTON, DC**

**The NAB Awards for Innovation In Media (AIM) will also be presented.**

**2:00 PM - 5:00 PM**

### **FACILITIES MANAGEMENT FOR RADIO AND TELEVISION**

LAS VEGAS CONVENTION CENTER - ROOM N109

**CHAIRPERSON: TROY PENNINGTON, CUMULUS BROADCASTING, INC., MOBILE, AL**

**2:00 PM**

#### **NEW STANDARDS FOR BROADCAST STRUCTURES ANSI/TIA/EIA-222-G**

The next revision of the ANSI/TIA/EIA standard Structural Standards for Steel Antenna Towers and Antenna Supporting Structures will represent the most drastic change to the standard since its first publication in 1949. This revision will radically change the loads and design criteria for communication towers including broadcast structures. This presentation will present the major changes proposed and explain how they may affect you.

**Presenters: JOHN WAHBA, RADIAN COMMUNICATION SERVICES, ONTARIO, CANADA; DAVID BRINKER, ROHN INDUSTRIES INC., METAMORA, IL; MARK MALOUF, P.E. MALOUF ENGINEERING, RICHARDSON, TX; JOHN ERICHSEN, P.E., VALMONT COMMUNICATIONS, PLYMOUTH, IN**

**2:30 PM**

### **NOVEL METHOD FOR DETECTING LEAKS ON PRESSURIZED TRANSMISSION SYSTEMS**

Pressurized transmission system leak detection has been, at best, a difficult task. Typically, tower firms use bubble solutions and aural location to find leaks. Recently the high tech instrumentation industry has been successful in producing extremely sensitive, lightweight mass spectrograph equipment (MSE) helium leak detectors. With battery power lightweight construction, computerized touch screen control systems, and small size it is now practical to use helium leak detection MSE's for broadcast transmission systems with minimal personnel training.

**Presenter: HAL SMITH, AM/FM SERVICES COMPANY /LEAKSTECH.COM, EDMOND, OK**

**3:00 PM**

### **DESIGNING FOR THE UNEXPECTED**

The presentation will discuss the factors which need to be considered when designing or adapting a building for broadcasting use, including electricity, water supply, flooding, air quality and security. Using the British Broadcasting Corporation's new Broadcasting House and White City developments as examples, this presentation will illustrate how resilience and flexibility can be enhanced.

**Presenter: GEORGE CROWE, GEORGE CROWE ASSOCIATES, LONDON, UK**

**3:30 PM**

### **TELECOMMUNICATIONS TOWERS & EQUIPMENT: LEGAL DUTIES OF OWNERS, ENGINEERS AND CONTRACTORS**

This presentation discusses issues related to cause and origin of collapse investigation, tower rebuild issues, insurance and business interruption considerations, damage control and investigation, and other legal ramifications from a major collapse. The presentation includes examples from collapses handled for various interested parties.

**Presenter: VINCENT O'FLAHERTY, NIEWALD, WALDECK & BROWN, KANSAS CITY, MO**

**4:00 PM**

### **RF HAZARD CONTROL EQUIPMENT**

The FCC has just announced it's first fine for violation of RF safety regulations and insiders say that there are many more to come. There are two types of RF radiation protection equipment available to broadcasters: RF personal monitors and RF protective garments. What are the important things to consider when selecting and using

an RF personal monitor? What level of protection do RF "suits" provide? Can personal monitors be used with protective clothing? These subjects will all be addressed in the presentation.

**Presenter: RICHARD STRICKLAND, RF SAFETY SOLUTIONS, SOUTH SETAUKET, NY**

**4:30 PM**

**SYSTEMS INTEGRATION/DESIGNING AND BUILDING THE DIGITAL STUDIO FACILITY: MORE THAN BRICKS, MORTAR AND EQUIPMENT RACK - SUCCESS FACTORS IN THE PLANNING, DESIGN, CONSTRUCTION AND INTEGRATION OF A HIGH TECHNOLOGY DIGITAL MEDIA FACILITY**

A new broadcast or production facility can cost tens of millions to hundreds of millions of dollars to build and equip. Expenditures of these magnitudes assume a reasonable return on investment. This presentation will present a number of key and critical factors that help assure a successful outcome in the construction of high technology facilities or the major renovation of existing facilities. Factors discussed including business analysis, technology planning, workflow analysis, space planning, architectural and engineering criteria and implementation strategies.

**Presenter: JOHN AALTO, EDWARD HOBSON, NATIONAL TELECONSULTANTS, INC., GLENDALE, CA**

**WEDNESDAY, APRIL 9, 2003 • 6:00 PM - 8:00 PM**

**AMATEUR RADIO OPERATORS RECEPTION**

**LAS VEGAS HILTON - BALLROOM B**

Come to one of the most popular events at each year's NAB convention, the Amateur Radio Operators' Reception. Check out the official NAB2003 amateur repeaters: 146.940 - (100.0 Hz tone) and 449.700 - (127.3 Hz tone). Courtesy of the Las Vegas Amateur Radio Club. Don't miss out on your chance to win some fabulous prizes! The Amateur Radio Operators Reception is sponsored this year by Kenwood Communications Corporation and CQ Magazine.

**THURSDAY, APRIL 10, 2003 • 9:00 AM - 12:00 PM**

**WORKBENCH TIPS FROM RADIO WORLD'S JOHN BISSET**

**LAS VEGAS CONVENTION CENTER - ROOM N111**

**Presenter: JOHN BISSET, HARRIS BROADCAST, BURKE, VA**

THURSDAY, APRIL 10, 2003 • 9:00 AM - 12:00 PM

## **TELEVISION PRODUCTION & OPERATIONS**

LAS VEGAS CONVENTION CENTER - ROOM N109

Chairperson: **MARCUS WILLIAMS, WDIV, DETROIT, MI**

**9:00 AM**

### **GETTING FROM AIR TO THE FIELD**

The latest advancements in nonlinear editing systems and shared digital media networks enable field journalists to produce finished packages on site and play directly to air from their remote location. This presentation will detail a common mistake: an overly-simplistic approach to solving the portable editing problem which results in larger complications when integrating field-produced stories into an efficient news workflow.

Presenter: **DAVID SCHLEIFER, AVID TECHNOLOGY, INC.,  
TEWKSBURY, MA**

**9:30 AM**

### **VIDEO TRACKING FOR VIRTUAL OBJECT INSERTION**

This presentation presents a description of a real-time video-tracking algorithm used to insert virtual objects into broadcast video. This technology is used to insert, for example, the first down line in American football games. The human visual system is very sensitive to relative motion between objects, so tracking needs to be accurate to within a small fraction of a pixel. Complex motion within a scene presents challenges far beyond those of fast camera motion. Video examples show, with the aid of real-time diagnostics, how the tracker identifies and rejects contributions from moving objects.

Presenter: **BRIAN ASTLE, PRINCETON VIDEO IMAGE,  
LAWRENCEVILLE, NJ**

**10:00 AM**

### **HIGH DEFINITION APPLICATIONS OF A PARALLAX SCANNING ZOOM LENS**

This presentation describes a new technology called V3 parallax scanning that creates sharper video images with enhanced textures, shape definition and improved quality. V3 is compatible with standard displays and no special glasses or additional viewing equipment is required. V3 images can be broadcast or distributed on standard media. The image enhancement is accomplished by exploiting certain psychophysical mechanisms of the human visual system. The V3 method of parallax scanning has been applied to a zoom lens for high definition imaging.

Presenter: **CHRISTOPHER MAYHEW, VISION III IMAGING, INC,  
HERNDON, VA**



10:30 AM

### **PRACTICAL SOLUTIONS FOR NEWS AND SPORTS: HOW SIR ISSAC NEWTON HELPS KEEP CAMERA LENSES CLEAR FROM RAIN AND SNOW**

An overview of the Spintec Technology will be presented in an informative and case study method. A description of how Newton's laws of motion, combined with a simple Galilean Transformation provides us today with a suite of products that protect the image we are capturing, by keeping the optical lenses clear at all times from all types of environmental substances that may impair the vision of a lens. The presentation will also describe the evolution of the technology, from a crude World War I application, where the lens was rotated around the center, only enabling vision on the sides, to today's technology, originally created for the field of cinematography.

**Presenter: LOUIS LIBIN, BROAD COMM, INC., WOODMERE, NY**

11:00 AM

### **NUGGETS AND MXF - MAKING THE NETWORKED STUDIO A REALITY**

NUGGETS is a European Project researching the use of MXF files on IT networks allowing remote control of cameras in a live production environment. The project partners are creating a LAN/WAN based. This presentation outlines many of the issues discovered in the process of moving from tape/streaming environment to a server/file interchange environment. Details of network functionality will be given in order to generate audience discussion.

**Presenter: WOLFGANG RUPPEL, T-SYSTEMS, DARMSTADT, GERMANY**

11:30 AM

### **CMOS VS. CCD: CHANGING TECHNOLOGY TO SUIT HDTV BROADCAST**

The CCD has been the preferred visible image-capture sensor technology in a variety of applications from consumer digital cameras to expensive scientific instruments primarily due to its relative low-noise operation. However, the CMOS-based paradigm today offers fundamental performance advantages including optimum bandwidth and higher sensitivity. CMOS sensor technology has arrived and is expected to drive the demand for low cost, portable cameras over the next five years.

**Presenter: LESTER KOZLOWSKI, ROCKWELL SCIENTIFIC, THOUSAND OAKS, CA**

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## NAB 2003 • NAB Broadcast Engineering Conference • April 5-10, 2003

Time	Saturday April 5	Sunday April 6	Monday April 7	Tuesday April 8	Wednesday April 9	Thursday April 10				
9:00 - 4:00 pm	<b>SBE Ennes Workshop</b>  William Hayes, Iowa Public TV Fred Baumgartner, Comcast  LVCC N111	9:00 am – 1:00 pm IEEE/BTS Tutorial VSB Enhancements  Tom Gurley, MSTV  LVCC N109	9:00 am BEC Opening Leonardo Chiariglione, VP, Multimedia, Telecom Italia Lab  LVCC N109		All Industry Opening and Keynote    Implementing PSIP and Metadata Art Allison, NAB  LVCC N109	Radio Transmission Forum  Andy Laird, Journal Broadcast Group  LVCC N111	Technology Based Broadcast Services  Jeff Littlejohn, Clear Channel Communications  LVCC N109	Television Production & Operations  Marcus Williams, WDIV  LVCC N109	Workbench Tips from Radio World's John Bisset  LVCC N111	
		DTV Conversion Issues & Solutions – Part I  Jeff Andrew, Gannett Broadcasting  LVCC N109	IBDC DAB – Ready for Prime Time – Part I  Milford Smith, Greater Media, Inc.  LVCC N111	Digital Television Around the World  Bill Napier, Bahakel Communication  LVCC N109						International Broadcast Developments  Don Messer, IBB  LVCC N111
1:00 - 5:00 pm	<b>SBE Ennes Workshop</b>  William Hayes, Iowa Public TV Fred Baumgartner, Comcast  LVCC N111	2:00 – 4:00 pm HDTV Codecs – How Much Bandwidth Does It Take?  Mark O'Brien SpectraRep, Inc.  LVCC N109	DTV Conversion Issues & Solutions – Part II  Ted Teffner, WCAX-TV  LVCC N109	IBDC DAB – Ready for Prime Time – Part II  Jeff Littlejohn, Clear Channel Comm.  LVCC N111	Digital Storage and Asset Management for Broadcast Content  Tom Weber, WISH-TV  LVCC N111	MPEG - Enabling Broadcast and Media Convergence  LVCC N109	DTV Reception and Enhancements  Jeff Andrew, Gannett Broadcasting  LVCC N109	Radio Audio Forum  Andy Laird, Journal Broadcast Group  LVCC N111	12:00 – 1:45 pm Technology Luncheon Speaker - George Gilder, Chairman, Gilder Publishing, LLC and Editor, Gilder Technology Report LVH - Barron Room  Facilities Management for Radio & Television  Troy Pennington, Cumulus Broadcasting Inc.  LVCC N109	
								6:00 pm Amateur Radio Operators Reception - LVH Ballroom B		





*Please join us for the presentation of  
the following papers by Dielectric  
engineers.*

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Solutions for the Implementation  
of FM IBOC Technology

Henry Downs  
Sunday, April 6th  
3:00 pm

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Real Life Experiences in  
Common-Site Multistation  
FM And TV Projects

Kerry Cozad  
Sunday, April 6th  
5:00 pm

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Care and Feeding of FM  
Multichannel Antennas

Bill Kerkhoff  
Tuesday, April 8th  
11:30 am

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The logo for Dielectric features the word "Dielectric" in a large, bold, serif font. A stylized, curved line above the letter 'i' in "Dielectric" suggests a signal or wave.

[www.dielectric.com](http://www.dielectric.com)