

## TABLE OF CONTENTS

<p><b>NAB Broadcast Engineering Conference Opening Keynote</b>            Sunday, April 7, 2013            9:00 – 9:30 a.m. .... 1</p>	<p><b>Deploying Artist Experience (Album Art) via HD Radio</b>            Alan Jurison, Clear Channel Media + Entertainment ..... 53</p>
<p><b>Advanced Technologies for Television</b>            Sunday, April 7, 2013            9:30 a.m. – 5:00 p.m. .... 3</p>	<p><b>Standards for Hybrid Radio</b>            Nick Piggott, RadioDNS Project ..... 60</p>
<p><b>“ATSC 3.0,” the Next Generation Broadcast Television System</b>            James Kutzner, PBS; Skip Pizzi, NAB; Luke Fay, Sony Electronics ..... 5</p>	<p><b>Program Associated Data Deployment at Wisconsin Public Radio</b>            Steve Johnston and Kevin Trueblood, Wisconsin Public Radio ..... 65</p>
<p><b>The Future of TV— Project Fresco</b>            Simon Parnall, Kevin Murray, and James Walker Cisco ..... 11</p>	<p><b>IP for Radio</b>            Sunday, April 7, 2013            1:00 – 5:00 p.m. .... 69</p>
<p><b>DVB Next Generation Handheld: The Ultimate Air Interface for Mobile TV?</b>            Peter Siebert and Frank Herrmann, DVB Project .... 19</p>	<p><b>Audio Reliability over the Public Internet: Designing Robust IP Streaming for Outside Broadcasts, STL and Program Distribution</b>            Kirk Harnack, The Telos Alliance ..... 71</p>
<p><b>Use Cases for the New HEVC Standard</b>            Thierry Fautier, Harmonic Inc. .... 23</p>	<p><b>AES X192— An Emerging Standard for High-Performance Streaming Audio-over-IP Interoperability</b>            Andreas Hildebrand, ALC NetworX GmbH ..... 76</p>
<p><b>Terrestrial 4K-UHDTV Experimental Broadcasting in Korea</b>            Byungsun Kim, Injoon Cho, Ilsoo Kyung, Sangjin Hahn, and Jinmo Kang, Korean Broadcasting System ..... 27</p>	<p><b>Audio Networking Interoperability: Advantages, Challenges and Standards</b>            Ted Staros and Chuck Alexander, Harris Broadcast Communications ..... 83</p>
<p><b>HEVC—Driving Disruption in Multiscreen Converged Service Delivery Architectures</b>            Ken Morse and Arturo Rodriguez, Cisco Systems .. 33</p>	<p><b>Advances in AoIP Connectivity for Extending the Radio Operation Beyond the Studio</b>            Andrew Calvanese, Wheatstone Corporation ..... 88</p>
<p><b>Which Broadcast Workflow Will Deliver Ultra High Definition to the Home?</b>            Ian Trow, Harmonic Inc. .... 39</p>	<p><b>The Open Control Architecture</b>            Jeffrey A. Berryman, Bosch Communications Systems ..... 93</p>
<p><b>Mobile Multimedia Broadcasting Based on ISDB-Tmm: A Future of Broadcasting, Available Today</b>            Masayuki Ishikawa, mmbi, Inc. .... 46</p>	<p><b>IP Audio in the Real-World: Pitfalls and Practical Solutions Encountered and Implemented When Rolling out the Redundant Streaming Approach to IP Audio</b>            Kevin Campbell, WorldCast Systems ..... 104</p>
<p><b>Advanced Technologies for Radio</b>            Sunday, April 7, 2013            9:30 a.m. – 12:00 p.m. .... 51</p>	<p><b>Taking the “Sting” Out of Evolving Digital Audio Networks</b>            Gregory F. Shay, The Telos Alliance ..... 109</p>

## **Audience Measurement Technologies**

Monday, April 8, 2013  
10:30 a.m. – 12:00 p.m. .... 115

## **Nielsen Watermarking: The Value of Nielsen Content Identification Practices**

Scott Brown, Nielsen ..... 117

## **Integrating Television with Mobile**

Suresh Narasimha, TELiBrahma Technologies Inc. .... 121

## **Audience Measurement for iPad**

Scott Brown, Nielsen ..... 125

## **Spectrum Matters**

Monday, April 8, 2013  
10:30 a.m. – 12:00 p.m. .... 129

## **Television Spectrum Repacking—What It Will Mean for Your Station and How to Prepare**

Jay C. Adrick, Harris Broadcast Communications 131

## **Spectrum Efficiency and Eight Pole Mask Filters**

Daniel S. Fallon, SPX Communication Technologies..... 135

## **Broadcast Mobile TV Technical Status**

Monday, April 8, 2013  
1:00 – 5:00 p.m. .... 141

## **Mobile Emergency Alerting via ATSC MDTV**

James Kutzner, PBS; Wayne Luplow, Zenith Electronics LLC; Jay C. Adrick, Harris Broadcast Communications; Wayne Bretl, Zenith Electronics LLC ..... 143

## **Audio for Mobile TV, iPad and iPod**

Thomas Lund, TC Electronic A/S ..... 147

## **Single Frequency Network over ATSC M/H Framework**

Henry Rodrigues, Hitachi Kokusai Linear ..... 154

## **Radio Receiver Technologies**

Monday, April 8, 2013  
1:00 p.m. – 3:00 p.m. .... 159

## **Adaptive Impedance Matching (AIM) for Electrically Small Radio Receiver Antennas**

Brian Kroeger and Paul Peyla, iBiquity Digital Corporation..... 161

## **Advances in HD Radio – Improving Coverage and Reception Quality**

Branimir Vojcic, The George Washington University; Hakan Dogan, Istanbul University; Wookwon Lee, Gannon University; Stylianos Papaharalabos, Institute for Space Applications and Remote Sensing; Farnaz Shayegh, McGill University ..... 172

## **AM Band Revitalization**

Monday, April 8, 2013  
3:00 p.m. – 5:30 p.m. .... 181

## **WBCN All-digital AM IBOC Field Test Project**

David Layer, NAB; Alan Lane and E. Glynn Walden, CBS Radio; Russ Mundschenk, iBiquity Digital Corp.; Dennis Wallace, MSW; Tom King, Kintronic Labs ..... 183

## **New Life for AM with Digital Transmission (A Look at the Options)**

Hal Kneller, Nautel..... 194

## **IEEE BTS Tutorial: IP in the Broadcast Plant**

Monday, April 8, 2013  
2:00 – 5:00 p.m. .... 201

## **Radio Engineer's Forum**

Tuesday, April 9, 2013  
9:00 a.m. – 5:00 p.m. .... 203

## **Maximizing STL Robustness through Intelligent Interplay of RF and IP**

Junius Kim and Keyur Parikh, Harris Broadcast Communications..... 205

## **A Free Online VHF/UHF Propagation Tool for Technical and Non-Technical Users**

Charles W. Kelly, Jr., Nautel Limited ..... 210

## **Enhanced Emergency Alert™ Delivery Mechanism Over HD Radio Signals**

Marek Milbar, iBiquity Digital Corporation..... 214

## **Using Public Domain and Open Source Software to Derive Base Drive Voltages for AM Method of Moments Models**

Tom Cox, Clear Channel Media + Entertainment..221

## **Tomorrow's STL Today**

Jeffrey Holdenrid, DoubleRadius Inc. .... 228

**Integrated Content Presentation at the Canadian Broadcasting Corporation**  
Scott Stewardson and Jeffrey Vella, Canadian Broadcasting Corporation.....232

**A Way of Improving T-DMB/DAB Reception Performance by Obtaining Diversity Gain in Legacy Single Frequency Networks**  
Yong-Tae Lee, Myung-Sun Baek, So-Ra Park, Yong-Hoon Lee, Geon Kim, Bo-mi Lim, Hyoungsoo Lim Electronics and Telecommunications Research Institute (ETRI) .....237

**Design Parameters for FM Signal Repeaters Based on Listener Testing**  
John Kean, NPR Labs; Ellyn Sheffield and Miranda Hines, Towson University .....242

**New Findings on FM Stereo Multipath Control**  
Jeffrey A. Keith, Wheatstone Corporation .....248

**SNMP and Me: Real World Experiences of Using an Ancient Protocol in a Modern Broadcast Facility**  
Tony Peterle, WorldCast Systems Inc. ....254

**Television Technical Challenges in Need of Solutions**  
Tuesday, April 9, 2013  
9:00 a.m. – 11:30 a.m. ....265

**Intelligent Uses of Speech Analysis Tools in the Ancillary Data, Metadata and Captioning Areas of Broadcast to Reduce Costs and Cater to Dramatically Increased Media Throughout**  
Sam Pemberton, Softel .....267

**Live Closed-captioning System Using Hybrid Automatic Speech Recognition for Broadcast News**  
Akio Kobayashi, Yuya Fujita, Takahiro Oku, Shoen Sato, Shinichi Homma, Takashi Arai, and Toru Imai, NHK .....277

**Program Metadata: Accuracy and Timely Distribution Matters**  
Mick Rinehart, Broadcast Interactive Media.....284

**Video Production**  
Tuesday, April 9, 2013  
1:00 p.m. – 5:30 p.m. ....287

**Red Bull Stratos—Remote Production at the Edge of Space**  
Thomas Riedel, Riedel Communications GmbH & Co. KG.....289

**FIMS: A Framework for Interoperable Services in Media Production: What the Market Wants!**  
Jean-Pierre Evain, EBU; Brad Gilmer, AMWA; John Footen, Cognizant; Georgio Dimino, RAI CRIT; Paul Gardiner, Sony Professional Solutions Europe; Antony Caruso, CBC; Michael Koetter, Turner/CNN; Peter Brightwell, BBC; Andreas Aust, Tixel; Tony Vasile, Signiant; Michelle Munson, Aspera; Andrea DiMuzzio, Aspera; Richard Cartwright, Quantel; Frank Schaffa, IBM; Loic Barbou, Triskel & Bloomberg; Roman Mackiewicz, Bloomberg; Abbe Wiesenthal, Turner Broadcasting; François Abbe-Mesclado.....294

**Elections 2012, Cambodia Streaming Web Video from the Trenches**  
Gordon Burnett, Radio Free Asia .....302

**Super Hi-Vision Public Viewing Sessions at the 2012 London Olympics**  
Hayato Fujinuma, Koji Nishida, and Masayuki Sugawara, NHK (Japan Broadcasting Company)..306

**Television Quality Assurance**  
Wednesday, April 10, 2013  
9:00 a.m. – 12:00 p.m. ....315

**Is Quality Control in the File-Based Workflow a Necessary Evil?**  
Simon Adler and Bruce Devlin, AmberFin Ld.....317

**Opportunities and Challenges of TV Anytime, Anywhere**  
Gary Learner, Volicon Inc.....321

**Technical Regulatory Matters for Broadcasters**  
Wednesday, April 10, 2013  
9:00 a.m. – 12:00 p.m. ....325

**Two Steps Forward: A Voluntary Path for Local/State EAS**  
Richard Rudman, The Broadcast Warning Working Group.....327

**How the FCC's Repacking of the TV Band Will Affect Your Station**  
William Godfrey, Kessler and Gehman Associates, Inc. ....332

**The Web and TV**  
Wednesday, April 10, 2013  
2:00 p.m. – 5:00 p.m. ....339

**Internet-Delivered Television using MPEG-DASH: Opportunities and Challenges**  
Lars George, Stefan Pham, Stefan Kaiser, Christopher Krauss, and Stefan Arbanowski, Fraunhofer Institut FOKUS .....341

**Protected Content Pipeline—Delivering Protected Content in the Windows Ecosystem Using HDCP, OPM and PlayReady with Your Media Stream**  
Jonathan Tanner, Microsoft .....348

**The Media Warehouse Concept for Electronic Media Content Distribution**  
Steven Chester, Kurt Michel, and Ahmet Ozalp, Akamai Technologies, Inc. ....352

**The Fast Maturing Apps for TV and Web for TV Market**  
Terry Hughes, Colin Chong, and Tom Mullen, AppCarousel, Inc. ....355

**HbbTV— Status and Prospects**  
Klaus Illgner, Institut für Runkfunktechnik .....359

**Cloud Based Storage and Distribution**  
Wednesday, April 10, 2013  
2:00 p.m. – 6:00 p.m. ....363

**LTO-6 Technology with LTFS in the Media and Storage Industry**  
George Anderson, Rainer Richter and David Trumbo, Media Technology Market Partners, LLC. ....365

**How to Master Media Production in a Multi-Cloud Environment with Social Network Technologies**  
Stephan Schneider, Reelway GmbH .....370

**Using the Cloud and Edge Video Servers as an Alternative to Satellite for the Distribution of Linear Channels**  
Pablo Salomon and Bruno Martinez, Inetsat .....375

**IP for Television**  
Thursday, April 11, 2013  
9:00 a.m. – 12:30 p.m. ....379

**When Will Plants Go 100% IP Routing?**  
Stan Moote and Paul Greene, Harris Broadcast .....381

**Towards an All-IP Master Control**  
Thomas Edwards, Fox Network Engineering and Operations .....386

**From Super Bowl to Collegiate: Live Sports Coverage Using Cellular Bonding Technology**  
Ken Zamkow, LiveU, Inc. ....391

**Cellular ENG Comes of Age: Aggregating Multiple Wireless Transmission Technologies to Deliver Highly Reliable, Live HD Video**  
Bogdan Frusina and Bill Nardi, Dejero Labs Inc. .395

**QoS Improvements in Cellular News Gathering Systems**  
Eric McCulley, Vislink .....399

**Simplifying the Management of Video over IP**  
Jan Helgesen, Nevion .....404

**IEEE 802.1 AVB Ethernet Protocols and their Applicability to Broadcast Systems**  
Henning Kaltheuner, Riedel Communications .....409

**Planning for Safety**  
Thursday, April 11, 2013  
9:00 a.m. – 11:30 a.m. ....415

**LED Obstruction Lighting Systems Reduce Energy and Maintenance Costs**  
Jerry Ehlers and John Peck, Dialight Corp. ....417

**RF Radiation Measurement Improvements**  
Robert E. Johnson, Narda Safety Test Solutions ...422

**Tower Contractors' Qualifications, Safety Checklists and Guidelines—What to Look for...and Why?**  
Donald Doty, Stainless LLC; Pat Cipov, Cipov Enterprises, Inc.; Jimmy Coleman, Southern Broadcast Services, LLC. ....426

Author Index .....431

Company Index .....433