

# TABLE OF CONTENTS

## **BROADCAST ENGINEERING CONFERENCE OPENING**

Sunday, April 18, 1999 ..... 1

## **DTV: THE BIG PICTURE**

Sunday, April 18, 1999 ..... 3

### **Sharing the Vision - A Perspective on DTV Transmission from Shared Sites**

Michael Thorne, NTL Group Ltd. And Mark Aitken,  
COMARK Division, Thomcast  
Communications, Inc. .... 5

### **Designing the Digital Television Transmission Network What Broadcasters Need to Consider to Protect Their Long-Term Investment**

Barry Hobbs, NDS Americas Inc. .... 13

### **ATSC IS Top Down Committee Report and Findings**

Shannon Skemp and James A. Kutzner, Thomcast  
Communications, Inc. .... 20

### **Digital Television Interoperability - Issues and Progress**

Eric Gsell, Charles Einolf, Walt Husak and Alexandra  
Loubeau, Advanced Television  
Technology Center ..... 27

## **DAB: THE GLOBAL VIEW**

Sunday, April 18, 1999 ..... 33

### **The Broadcasting-Satellite Service (Sound) Using 2.6 GHz Band in Japan**

Shuji Hirakawa, (Toshiba Corporation) Association of  
Radio Industries and Businesses ..... 35

### **Draft Standard of Digital Terrestrial Audio Broadcasting in Japan**

Masayuki Takada and Makoto Sasaki, (NHK) and  
Tamotu Ikeda (Sony Corporation) Association of  
Radio Industries and Businesses ..... 45

### **Audio Processing for DAB and the Internet: How Audio Quality and Intelligibility Can Be Improved In the Data Reduced Environment, Using Dynamics Control**

Frank Foti, Cutting Edge ..... 52

## **DAB: MIGRATING TO A NEW WORLD**

Sunday, April 18, 1999 ..... 59

### **General Performance of Amplitude Modulated PDM Transmitters for Digital Broadcasting Using the IBOC System**

Wendell Lonergan, Nautel Maine, Inc. .... 61

### **Frequency Domain Reciprocal Modulation (FDRM) for Bandwidth-Efficient Data Transmission over Channels with Dynamic Multipath**

Tom Williams, Holtzman, Inc. .... 71

## **BUILDING THE DTV STATION INFRASTRUCTURE**

Sunday, April 18, 1999 ..... 83

### **High Performance Networking for Professional Video Applications**

Peter Owen, Quantel Ltd. .... 85

### **540 Mb/s Serial Digital Interface Pioneering New Standardization Approach at SMPTE**

Dan Turow, Gennum Corporation ..... 90

### **Asset Management Across Your Facility - A Case Study Examination of the LucasFilm Digital Media Management Infrastructure**

Timothy Campos and Beth Rogozinski, Silicon  
Graphics ..... 95

### **Old Earth Station IFL Cables and New DTV Downlink Performance**

Peter C. Zilliox, Andrew Corporation ..... 101

## **DATA BROADCASTING: WHERE IS THE MONEY?**

Monday, April 19, 1999 ..... 111

### **Understanding ATSC Datacasting -- A Driver for Digital TV**

Giri Venkat, Philips Semiconductors ..... 113

## **RECEIVING DTV BROADCASTS**

Monday, April 19, 1999 ..... 117

### **The Evolution of Front Ends for Digital TV**

Simon Wegerif, Philips Semiconductors ..... 119

### **Television Home Server for Digital HDTV Broadcasting**

Tatsuya Kurioka, Hiroki Minami, Toshiyuki Fujisawa,  
Haruo Okuda and Junji Numazawa, NHK ..... 123

**RADIO: THE COMPUTER CONNECTION**

Monday, April 19, 1999..... 131

**SAN Enabled Standard Network File System**

Doug B. Anderson, Transoft Networks Inc. ... 133

**DTV PRODUCTION**

Monday, April 19, 1999..... 139

**MPEG Splicing**Mike Knowles, Nigel Dallard and Alois Bock, NDS  
Broadcast..... 141**Emerging Technologies for Content-Based  
Access of Digital Video**Michael A. Smith and Robert Mozenter, ISLIP  
Media, Inc. .... 146**Workflow Implications of an Integrated Digital  
News Room**Charlie Bernstein, Leitch Technology  
Corporation ..... 159**Reframing *A Bug's Life***

Craig Good, Pixar ..... 164

**E. C. ACTS - MIRAGE: A Success Story in Virtual  
Reality**Chas Girdwood, Independent Television  
Commission ..... 181**Remote NLE**

Robin S. Rowe, SAIC ..... 188

**Design and Implementation of an Integrated News  
Production System**Guy Eaton, Steve Owen and Ian Stewart  
Quantel Limited..... 192**Tape Libraries in Digital Video Storage Area  
Networks**

Steve P. Georgis, Exabyte Corporation..... 199

**RADIO TRANSMISSION SYSTEMS - DIGITAL  
AND ANALOG**

Monday, April 19, 1999..... 203

**Protecting Broadcast Facilities From Lightning**Cris Alexander, Crawford Broadcasting  
Company..... 205**Frequency Agile Medium Wave Solid State  
Transmitter**

David L. Solt, P.E., Omnitronix, Inc. .... 213

**A Medium-wave Urban Antenna**Grant Bingeman, Continental Electronics  
Corporation ..... 218**Digital Peak Modulation Control: An Alias Free  
Limiting/Filtering Method Utilizing 48 kHz  
Sampling and No Overshoots**

Frank Foti, Cutting Edge..... 225

**Three Egyptian MW Broadcast Crossed Field  
Antennas**F.M. Kabbary, M. Khattab, A. Fayoumi, Egyptian  
Radio and TV Union; B. G. Stewart, Glasgow  
Caledonian University and M.C. Hately, Hately  
Antenna Technology..... 235**Using Synchronized Transmitters for Extended  
Coverage in FM Broadcast**Bill Gould and Jai Eu, Harris Communications  
Intraplex Transmission Solutions ..... 242**A Trial of AM/Digital Multiplexing Transmission**Atsushi Shinoda, Kenichi Shiraisi, Shuichi Okamoto,  
Shoichi Suzuki, Ryuichi Okazaki, Toshiyuki  
Takegahara, Masaoki Takai,  
Kenwood Corporation..... 254**DTV PROPAGATION ISSUES AND FIELD  
STUDIES**

Tuesday, April 20, 1999..... 259

**Understanding SNR in the Digital World**Brett Jenkins, COMARK Division, Thomcast  
Communications, Inc. .... 261**On the Validity of the Longley-Rice (50,90/10)  
Propagation Model for HDTV Coverage and  
Interference Analysis**

O. Bendov, Dielectric Communications..... 266

**Results of TV Receive Antenna Field Testing for  
Correlation of Digital and Analog Television  
Reception Using the CEMA Antenna Selector Map  
Program**Ray Conover, U.S. Satellite Broadcasting  
Company ..... 274**Comparing Panel and Slot Antennas in Shared  
Digital and Analog Service**Robin Blair and Anthony Magris, Radio Frequency  
Systems ..... 286

**DTV Taboo Channel Interference into NTSC at High Power Levels**

Stanley J. Salamon, Charles W. Rhodes and Charles W. Einolf, Jr. Advanced Television Technology Center ..... 293

**DIGITAL RADIO PRODUCTION**

Tuesday, April 20, 1999 ..... 299

**State of the Art Speech Processing for Broadcasting**

Martin Wolters, Cutting Edge ..... 301

**Codec after Codec and Codec...**

Christer Grewin, Swedish Broadcasting Corporation ..... 308

**How Many Bits Do You Hear?**

J. B. Brown, P.E. Auditronics, Inc. .... 315

**Universal 'Cart' File Interface for Audio Production/Delivery Systems**

Richard Pierce, Orban, Inc. .... 319

**RADIO CONSOLIDATION: REAL WORLD EXPERIENCES**

Tuesday, April 20, 1999 ..... 325

**Smart Radio Studio Construction Techniques in the Age of Consolidation**

G. Michael Patton, Michael Patton & Associates ..... 327

**Automating the Multiple Station Operation**

Jim Dalke, Medium Limited ..... 335

**2.4 GHz Spread Spectrum Radio and T1 Technology Combine for a Wireless T1 STL/TSL Solution**

David W. Agnew, Harris Corporation/Broadcast Systems Division ..... 340

**DTV TRANSMISSION SYSTEMS**

Tuesday, April 20, 1999 ..... 349

**Facility Design and Modeling for DTV Transmitter Systems**

William I. Booth, Quality Engineering, P.A. and Robert W. Denny, Denny & Associates, P.C. .... 351

**WBTV Field Experience, The First Full Power 1,000,000 Watt DTV ERP Station**

Andrew H. Whiteside, COMARK Division of Thomcast Communications Inc. .... 361

**Stable High Power Filters for the FCC DTV Emissions Mask**

Derek Small, Passive Power Products ..... 379

**Bandpass Filter and Linearization Requirements for the New FCC Mask**

Robert J. Plonka, Harris Corporation/Broadcast Systems Division ..... 387

**On-Channel Repeaters for Digital Television Implementation and Field Testing**

Walt Husak, Charles Einolf, and Stan Salamon Advanced Television Technology Center ..... 397

**A High Power, Low Beam Voltage, TV Broadcast IOT Amplifier System, with an Optional Multistage Depressed Collector**

Timothy Crompton, Steve Aitken, Steve Bardell, Roy Heppinstall and Geoff Clayworth, EEV, Ltd... 404

**Architecture of a DSP Based Dual-Mode ATSC/NTSC Television Exciter and Transmitter**

David L. Hershberger, Continental Electronics, Inc. .... 412

**Performance of a Multi-Program MPEG Encoding System in Constant Bit Rate and Statistical Multiplexing Modes**

Paul Haskell, Elliot Linzer, and Humphrey Liu, DiviCom ..... 420

**Modulation Schemes for Transmission of DTV Signals over Satellite**

Girish Chandran, Ph.D. Tiernan Communications, Inc. .... 426

**DTV AUDIO WORKSHOP**

Wednesday, April 21, 1999 ..... 433

**The ATSC Digital Audio System**

Stephen B. Lyman and Craig Todd, Dolby Laboratories Inc., ..... 435

**A Multichannel Audio Infrastructure Based on Dolby E Coding**

Stephen Lyman, Dolby Laboratories Inc. .... 442

**TECHNICAL REGULATORY HOT TOPICS FOR BROADCASTERS**

Wednesday, April 21, 1999 ..... 451

**FCC RFR Guidelines: Is Your Facility Really in Compliance?**

Stanley Salek and Robert Weller, Hammett & Edison, Inc. .... 453

**DIGITAL AUDIO FOR BROADCAST ENGINEERS**

Wednesday, April 21, 1999..... 463

**AES Audio for Broadcast Systems**

Gary Stephens, Leitch Incorporated..... 465

**Computers and Radio: The Networking Connection**

Chriss Scherer, *BE Radio* magazine ..... 469

**Building a Digital Station**

David M. Baden, Radio Free Asia ..... 484

**INTERACTIVE TECHNOLOGIES FOR TELEVISION**

Wednesday, April 21, 1999..... 497

**Going Beyond TV on the Web - Making Real-Time Web Based Searchable TV a Reality**

Mark Juliano, ISLIP Media, Inc. .... 499

**The Convergence of TV and PC - An Arranged Marriage**

Jurij Paraszczak, Frank Schaffa, David Seidman, Richard Chernock, Paolo Dettori, Steven Depp, IBM T. J. Watson Research Center ..... 506

**So You've Gone Digital... Now What?**

Dr. Dov Rubin, NDS Americas ..... 516

**ATSC Digital Television Data Broadcast and Interactive Services**

Aninda DasGupta, Philips Digital Video Group ..... 519

**TECHNICAL REGULATORY HOT TOPICS FOR BROADCASTERS**

Wednesday, April 21, 1999..... 529

**DTV IMPLEMENTATION WORKSHOP**

Thursday, April 22, 1999 ..... 531

**Principle Benefits and Applications of Variable Bit Rate Coding for Digital Video Broadcasting, with Statistical Multiplexing Extension**

Si Jun Huang, Scientific-Atlanta, Inc. .... 533

**Implementing PSIP Solutions**

Pierre Clement, James Kutzner, Shannon Skemp, Thomcast Communications, Inc. .... 543

**REMOTE BROADCASTING TECHNIQUES AND TECHNOLOGIES**

Thursday, April 22, 1999 ..... 553

**FQPSK Use for Electronic News Gathering (ENG), Telemetry and Broadcasting**

Hans Emmenegger, Broadcast Microwave Services, Inc. and Kamilo Feher, Ph.D. FQPSK Consortium and Digicom..... 555

**Multi-channel HDTV Transmission System Using Dense WDM for Full-scale On-site HDTV Broadcasting**

Shuichi Fujisawa, Yasuaki Nishida, Shun Moriasawa, Yosuke Endo, NHK..... 563

**New Internet and Broadband Video Technology for Remote Television Production**

Etienne Mirlesse, Obvious Technology, Inc. . 570

**Live Transmission System for the Tokyo Marathon Using 800 MHz COFDM Links from Moving Vehicles**

Jiro Hirono and Toshiyuki Kawashima, Fuji Television Network, Inc..... 577

**DTV PROPAGATION ISSUES AND FIELD STUDIES (Additional Presentation)**

Tuesday, April 20, 1999

**WCBS-DT DT Field Test Report**

Robert P. Seidel and Walter Sidas, P.E., CBS Inc..... 585

**Author and Presenter Index** ..... 626

**Company Index** ..... 628