

# Broadcast Technology Society Newsletter

The technologies to deliver information and entertainment to audiences worldwide, at home and on the go.

## From the President



Dear BTS Members:

September brings two major events for BTS this year – both IBC2006 in Amsterdam and our 56th Annual Broadcast Symposium, which returns to its traditional Hotel Washington venue a few weeks earlier than last year. It's always good to see many of our returning members and to meet new faces, and potential new members, at these annual conferences.

One of the headline topics at our upcoming Broadcast Symposium is Internet Protocol Television – or IPTV. It's been called “the next big thing” in multimedia content delivery, as IPTV services move from experimentation to

commercial deployment, and hundreds of telephone companies gear up over the next couple of years, vying with cable and satellite service providers for the broadband gateway to consumers' homes. The Symposium leads off with a tutorial on IPTV Technology Deployment, presented by a team from the Communications Research Centre Canada. Following the tutorial on Wednesday are presentations on IPTV, Mobile TV, and Multimedia topics, including IP Datacast over DVB-H. During the lunch break, John Day, Project Manager for IEEE.tv, will introduce and demonstrate this Internet broadcasting network being launched by IEEE.

One of the IPTV tutorial presenters, Hong Liu, has just returned from an ITU-T Focus Group on IPTV in Geneva. His trip report is inside this

Newsletter. The ITU-T is beginning to tackle the necessary and timely – perhaps overdue – issue of IPTV standardization. The IEEE has recently become a Sector Member of the ITU-T, and BTS  
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## From the Editor



When you receive this issue the **56th Annual Broadcast Symposium** will be almost upon us. This year as always the lineup of presentations and luncheon speakers

is impressive. The sessions that begin on Wednesday morning **September 27** and run through Friday afternoon **September 29** offer something for everyone and reflect the expanding scope of our society and the diversification of the broadcast industry. This event offers attendees the opportunity to hear about

cutting edge developments in their specific area of interest as well as the opportunity to broaden their horizons and learn about the latest developments in other areas of the industry. Today, with the rapid changes in technology as well as the business climate one never knows where the next career opportunity may be so it is important to keep an eye on areas in related fields and this symposium offers a great opportunity to do that. Also, by the way, it is also a great place to see old friends, network and make some new friends. Check out the preliminary program in this issue and some further

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## From the President continued

will continue to support its IPTV-related activities. Stay tuned for updates.

Another very timely topic we'll be addressing is Unlicensed Devices in the TV Broadcast Bands. The Telecom Act of 2006, which would open up the "white spaces" in the TV bands to such devices, is moving through the U.S. Congress – and it may be enacted by the time of the Symposium. Once it passes, the Federal Communications Commission will have 270 days to make the rules. The IEEE 802.22 committee, of which BTS is a liaison member, has accelerated its work toward a standard for cognitive Wireless Regional Area Networks that will operate on a non-interfering basis in the TV bands, in order that it can help to shape the FCC's decision. We'll hear from the Committee leadership, and from several stakeholders and observers of the process, in this Thursday afternoon session.

The presentations in our Technical Sessions represent the cream of the crop, selected from an unprecedented number of abstracts submitted this year. They are also geographically diverse, coming from eleven countries in North and South America, Europe, and Asia. For example, a highlight of the Thursday morning session on Digital TV Systems and Standards will be a technical review of the new Chinese terrestrial DTV standard that, as of this writing, is to be finalized in August. Our Symposium will be the first time the standard is discussed outside of China.

Our Luncheon Keynotes will complement the sessions on multimedia

technologies. On Thursday, we'll hear from David Young, Verizon's VP for Federal Regulatory Affairs. David will talk about Verizon's Fiber-to-the-Premises network architecture that promises to bring a wide array of broadband multimedia services to its customers. Friday's Luncheon speaker is John Abel, Senior Vice President of the US Telecom Association, which represents telecommunications service providers and suppliers the local exchange, long distance, wireless,

Internet, and cable industries. John is an old friend of the broadcast industry, from his years at the NAB and in subsequent data broadcasting ventures.

We look forward to seeing many of you in Washington. But, for those of you who won't be with us at the Symposium, we'll have a recap in the next Newsletter.

**Tom Gurley**  
**President**  
**IEEE Broadcast Technology Society**  
[tgurley@ieee.org](mailto:tgurley@ieee.org)

## From the Editor continued

details in our President's column and I hope to see all of you at the Symposium at the Hotel Washington in Washington, DC **September 27–29, 2006**.

Since our fall Symposium is a bit earlier than usual this year we have been rushing to get this newsletter out. As a result our content is a bit less than in previous issues but I believe we still have some interesting reading. Jerry Whitaker continues to provide us with updates on ATSC activities with an article on Transport Stream Verification. We also have a piece from Levent Sevgi that discusses a Matlab application for Medium and Short Wave DRM Systems Field Strength Predictions. In addition, Dmitry Tkachenko has provided a report on the **IEEE International Symposium on Consumer Electronics** held in St. Petersburg, Russia that was co-sponsored by the local BTS chapter. Dmitry also has provided a nice article commemorating the 70th birthday and the achievements of well known colleague and BTS member Alexander Artamonov. Mike Bennett, our Representative on the **International Broadcasting Convention** (IBC) Board, has brought us up-to-date on the IBC

that will take place in Amsterdam September 8 through 12, 2006 and the BTS hosted Tutorial on Video Display Technology at the IBC conference on September 7, 2006. For those of you who are not aware of it, the BTS is one of the partners in the IBC and as a result a substantial portion of our society income is a result of that partnership.

In the U.S. we are heading toward completing the transition to terrestrial digital television (DTV). Beginning with the next issue we plan to have a series of articles that will look at how we got to this point, the practical technical and regulatory hurdles that remain to be resolved and track the progress toward the now mandatory shutoff of analog television service in February 2009. If anyone would like to contribute an article or just share your experience or concerns with those preparing the articles please contact me as we would welcome your input. I believe these articles will be of great interest to our members in the U.S. and we hope to our colleagues around the world.

**Bill Meintel**  
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## Newsletter Deadlines

The BTS Newsletter welcomes contributions from every member. Please forward materials you would like included to the editor at [wmeintel@computer.org](mailto:wmeintel@computer.org). Here are our deadlines for upcoming issues:

| Issue        | Due Date         |
|--------------|------------------|
| Winter, 2006 | October 20, 2006 |
| Spring, 2007 | January 20, 2007 |
| Summer, 2007 | April 20, 2007   |
| Fall, 2007   | July 20, 2007    |

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# IEEE 56th ANNUAL BROADCAST SYMPOSIUM

27-29 September 2006  
Hotel Washington  
Washington, DC

The 56th Annual Broadcast Symposium offers an exciting program, with cutting-edge presentations by leading professionals in the broadcast engineering field. On Wednesday, the program opens with a Tutorial on IPTV Technology Deployment, followed by presentations on IPTV, Mobile TV, and Multimedia Technologies. Thursday's sessions include Digital TV Systems & Standards and Unlicensed Devices in the TV Broadcast Bands. Friday's sessions include Distributed Transmission Systems and Radio Broadcast Engineering. The program also includes a top-level luncheon speaker each day.

In addition, the Symposium serves as an opportunity for you to network, meet with old friends and make new friends. Plan to attend the Welcome Reception on Wednesday evening.

For details and on-line registration, please visit the Symposium website at: [www.ieee.org/btsymposium](http://www.ieee.org/btsymposium)

## Preliminary Technical Program

*Subject to Change*

### Wednesday, September 27 IPTV

Session Chair – James Fang, Consultant

*IPTV: Technology Deployment – A Tutorial*

Wei Li, Hong Liu, & Yiyan Wu, Communications Research Centre - Ottawa, Ontario, Canada

*Video over IP – A Case Study*

John Delay, Harris Corporation – Mason, OH USA

*Stream Quality Assurance for IPTV*

Ralph Bachofen, Triveni Digital - Princeton Junction, NJ USA

### Box Lunch

*Introduction to IEEE.tv*

John Day, Senior Manager of Membership Business Development, IEEE

### Mobile TV & Multimedia Technologies

Session Chair – Greg Best, GB Consulting

*Application Management Method Based on GEM for Interoperability Guarantee of Applications Among Data Broadcasting Platforms*

Gyoung Ho Cha, Electronics and Telecommunications Research Institute (ETRI) – Yuseong-gu, Korea

*The Convergence of Diverse Network Technologies in Only One Set Top Box (For the Future Brazilian Scene)*

Rodrigo Admir Vaz, University of San Paulo - Sao Paulo, Brazil

*A Mobility Support Architecture for DVB-H / IP Datacast Terminals based on IEEE 802.21*

Gunther May, Braunschweig Technical University - Germany

*Optimization of PSU/SI Transmission in IPDC over DVB-H Networks*

Jani Vare, Nokia - Turku, Finland

*Approaches for Smooth Buffering in Mobile TV over DVB-H*

Imed Bouazizi, Nokia - Turku, Finland

### Evening Welcome Reception

### Thursday, September 28

#### Digital TV Systems & Standards

Chair – Brett Jenkins, Thomson Broadcast

*ATSC Recommended Practice on Bitstream Verification*

Rich Chernock, Triveni Digital - Princeton Junction, NJ USA

*Advanced VSB - A Proposed Enhancement for ATSC DTV*

Jungpil Yu, Samsung & Mike Simon, Rohde & Schwarz - Korea/USA

*Objective Evaluation of Audio Com-*

*pression Standards and Tools for Digital TV Applications*

Regis Rossi A. Faria, University of Sao Paulo – Sao Paulo, Brazil

*Technical Review of the Chinese Digital Terrestrial Television Broadcasting Standard*

Jian Song, Tsinghua University – Beijing, China

*Broadband Antenna Systems Engineering and Operations*

John Figura, Richland Towers – Tampa, FL USA

### Joint BTS/AFCCE Luncheon

*Fiber to the Premises: Lighting the Way to Cable Competition*

David E. Young, Vice President, Federal Regulatory Affairs, Verizon Communications

### Unlicensed Devices in the TV Broadcast Bands

Session Chair – Eric Wandel, Research Associates of Syracuse

*Legislative and Regulatory Landscape for Unlicensed Device Operation in the TV Broadcast Bands*

Bill Meintel, Meintel, Sgrignoli & Wallace – Washington, DC USA

*An Update on the IEEE 802.22 Standards Process for Cognitive Wireless Regional Area Networks (WRAN)*

Gerald Chouinard, Vice Chair, IEEE 802.22, Communications Research Centre – Ottawa, Ontario, Canada

### Interference to UHF-DTTV Channels by Unlicensed Devices

Oded Bendov, TV Transmission Antenna Group – Cherry Hill, NJ USA

*ATSC-DTV Receiver Adjacent Channel Performance with Unlicensed Devices*

Douglas Prendergast, Communications Research Centre – Ottawa, Ontario,

Canada

*Practical Rules for Use of Cognitive Radios Within Existing Spectrum Allocations*

Alan Waltho, Intel – USA

*The Broadcasters' Perspective and Technical Issues for Broadcasters*

Victor Tawil, Association for Maximum Service Television – Washington, DC USA

*Panel Discussion on Unlicensed Devices in the TV Broadcast Bands*

Moderator – Bill Meintel, Meintel, Sgrignoli & Wallace – Washington, DC USA

## Friday, September 29

### Distributed Transmission Systems

Session Chair – Mike Simon, Rohde & Schwarz

*DTV Coverage Enhancement Using On-Channel and Translator Rebroadcast Technologies*

Sam Zborowski, Consultant – USA

*Performance of an Echo Canceller for On-Channel Repeaters in DVB-T/H Networks*

Karim Nasr, Brunel University – UK  
*Verification of Performance of Coupling Loop Interference Canceller for On-Air Relay in an SFN - On-Channel Repeater for ISDB-T*

Koichiro Imamura, NHK – Tokyo, Japan

*Field Test Results of Digital On-channel Repeaters in the DTV Transmission Network in Korea*

Young-Woo Suh, KBS - Korea

*Field Testing a Distributed Transmission System*

S. Merrill Weiss, Merrill Weiss Group LLC – Metuchen, NJ USA

### IEEE-BTS Awards Luncheon

*Where Are the Digital Networks Taking Us?*

John Abel, Senior Vice President, US Telecom Association

*Radio Broadcast Engineering*

Session Chair – Robert Surette, Shively Labs

*Revisiting Medium Wave Ground Systems*  
Benjamin Dawson, Hatfield & Dawson

*Consulting Engineers – Seattle, WA USA*  
*Subjective Evaluation of the Reception Quality Thresholds for the Digital Radio Mondiale Broadcast Standard*  
I. Fernandez, University of the Basque Country – Spain

*Digital Multimedia Broadcasting (DMB)*

Pascal Marcoux, Communications Research Centre – Ottawa, Ontario, Canada

*Ground Wave Field Measurements in the Medium Wave Band in Rural Environment*

F. F. Lima, University of Brasilia - Brasilia, Brazil

*Simplified Calculation of Ground Losses in Low and Medium Frequency Antenna Systems*

Valentino Trainotti, University of Buenos Aires – Argentina

*A Precision Low Cost GPS Based Synchronization Scheme for Improved AM Reception*

Steve Smith, Harris MCD – USA

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# IEEE Broadcast Technology Society Representation and Tutorial Activities at IBC2006

By Mike Bennett, BTS AdCom Member and IEEE BTS Representative on the IBC Board

## IEEE BTS Information Booth

The IEEE BTS will be staffing an information booth at the 2006 International Broadcasting Convention (IBC) during a five-day exhibition from 8 through 12 September 2006 at the RAI Exhibition and Congress Centre in Amsterdam, Netherlands. The IEEE BTS booth will be located in the partnership village at IBC Exhibitor Stand Number 8.750b which is located in the same familiar location in the lobby of the exhibit hall 8. Attendees will see the partnership village has a new look this year. You are invited to stop by and meet with the BTS representatives Tom Gurley, President of the BTS, Mike Bennett, BTS AdCom Member

and IEEE BTS Representative on the IBC Board, Yiyan Wu, Editor-in-Chief of the BTS Transactions on Broadcasting and Kathy Colabaugh, BTS Publications Administrator. They will be glad to talk with you and help you with any questions you may have about the IEEE and the BTS.

All 11 exhibit halls at the RAI Centre are fully occupied with over 1000 exhibitors. You can find substantial detail about the entire convention on the IBC web page, [www.ibc.org](http://www.ibc.org), that is a new, updated web page. The IBC web page also provides information about how to access the online IBC TV, a web TV service which will provide selected interviews and panel

discussions on up-to-date subjects such as broadcast to mobile, IPTV and obviously High Definition which is about to be big business in Europe.

## IEEE BTS Tutorial

In addition, the IEEE BTS will be hosting a tutorial session during the IBC conference. The details are:

**Session Title:** Tutorial on Video Display Technology

**Session Chairman:** David Bancroft, Thomson Digital Media Solutions

**Date:** 7 September 2006

**Time:** 10:00 AM to 1:00 PM

**Location:** Room L, Amsterdam RAI Exhibition and Congress Centre

**Synopsis:** Video display technology

has undergone a sea of change over the last decade, as LCD, plasma, and DLP devices have all but supplanted the venerable CRT in consumer applications. Recent developments have improved such parameters as dynamic resolution, viewing angle, contrast, and color gamut – long-held advantages of the CRT – challenging its continued dominance even for critical professional viewing. However, challenges remain in achieving standardization of color gamut, contrast range and other

parameters across these new replacement technologies for content creators to continue to achieve consistent quality control.

This tutorial will be presented by the IEEE Broadcast Technology Society, a co-sponsor of the new IEEE/OSA Journal of Display Technology. It will draw upon the technical expertise of leading researchers and developers worldwide to explain these recent developments in the context of both consumer and professional applications. It will also offer a

peek at emerging technology still in the laboratory.

## **IBC2006**

The IBC Conference Sessions run from 7 through 11 September 2006. The five day conference will provide multiple sessions, workshops, panels and master classes. The IBC exhibition halls will be open five days starting Friday 8 September and finishing Tuesday 12 September 2006. For detailed information about IBC2006, please visit its website at [www.ibc.org](http://www.ibc.org).

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## **IEEE BTS Representative Attends The First ITU-T IPTV Focus Group Meeting**

by Hong Liu, Communications Research Centre, Canada

### **IEEE BTS Representation**

Hong Liu represented the IEEE BTS at the first meeting of the ITU-T IPTV Focus Group (FG IPTV). Below is Hong Liu's abridged trip report prepared for the BTS Newsletter.

### **Internet Protocol Television Focus Group (FG IPTV) Meeting**

The FG IPTV first meeting was hosted by the ITU-T organization in Geneva, Switzerland from July 10 to 14, 2006. The ITU Telecommunication Standardization Sector (ITU-T is one of the three sectors of the International Telecommunication Union (ITU) The other two ITU Sectors are the Radio Communication Sector (ITU-R) and the Telecommunication Development Sector (ITU-D).

The FG IPTV meeting attracted over 150 delegates from ITU members and non-members. Most of attendees represented the world's leading telecom equipment manufacturers and other organizations working in IPTV related fields. More than 100 meeting documents and contributions were submitted, with the majority reviewed during the meeting. The two indicators of worldwide participation and the large number of meet-

ing papers support the requirement that IPTV standardization is timely and necessary.

### **Working Groups**

During the first meeting day, the delegates approved a draft agenda, work plan and formation of six working groups (WG) which are:

- WG1 for Architecture and Requirements,
- WG2 for QoS and Performance Aspects,
- WG3 for Service Security and Contents Protection Aspects,
- WG4 for IPTV Network Control,
- WG5 for End Systems and Interoperability aspects and
- WG6 for Middleware, Application and Content Platforms.

The delegates approved appointment of a leadership team, including the Chairman, Vice-Chairmen and working group leaders. Mr. Ghassem Koleyni from Nortel (Ottawa, Canada) was elected Chairman.

Since IPTV standardization started from scratch at this meeting, the working groups utilized approximately 2/3 of their time proposing and defining their mandates, terms of references, work items and producing working documents. Many outstanding issues

had no general agreement, which resulted in them being compiled into living lists for further consideration during the next meeting. The working groups studied liaison documents which provided useful information for developing an IPTV standard. Insufficient time was available during this meeting to study the IPTV technical issues. Additional inputs were requested prior to the next meeting so that further study of IPTV technical issues can be addressed then.

### **Plenary Meeting**

During the plenary meeting, the members approved all working documents prepared by the working groups. All outgoing liaison statements were also approved. A meeting output document was drafted which identified the requirements for IPTV standardization.

### **WG1 Meeting**

Mr. Liu primarily participated in the WG1 and WG2 meetings. The WG1 meeting focused its discussions on three subgroups consisting of (1) Requirements, (2) Architecture and (3) Service//Scenarios. The subgroups work proceeded slowly especially with the study of the IPTV architecture. No consensus was reached for

the proposed IPTV framework architecture and service architecture by the ad hoc subgroup meeting. The proposed functional model and functional sets of IPTV need further consideration. The WG1 participants decided to request contributions for high-level architecture diagrams which described IPTV network and service architectures with associated rationale and technical justification.

The WG1 meeting generated observations, dialogs and debates concerning:

1. Defining IPTV. Consensus was reached on a definition of Internet Protocol Television (IPTV) as: *"IPTV is multimedia services of delivering television/audio/text/graphics/data over IP based networks managed to provide the required level of Quality of Service (QoS)/Quality of Experience (QoE)<sup>1</sup>, security, interactivity and reliability."*
2. Studying the relationship of IPTV and the Next Generation Network (NGN)
3. Studying the IP Multimedia Subsystem (IMS)-based IPTV architecture
4. Proposing and identifying requirements for:
  - a. Architecture and service
  - b. QoS and performance aspects
  - c. Service security and content protection aspects
  - d. Network and control aspects
  - e. End systems and interoperability aspects
  - f. Middleware and application platforms.
5. Identifying and classifying the IPTV services
6. Identifying the roles/players/drivers
7. Identifying a number of well-know of business/commercial models

## WG2 Meeting

The meeting initiated work on aspects of Quality of Experience

(QoE) requirements, traffic management, application-layer reliability solutions and performance monitoring. All the proposals were discussed during the meeting.

The WG2 meeting generated observations, dialogs and debates concerning:

1. MPEG-2 codec versus the AVC/H.264 codec
2. Using MPEG-2 transport streams or video streams
3. An encapsulated MPEG-2 transport stream using the RTP protocol for transmission of video over IP

## Conclusion

The first IPTV Focus Group meeting was successful and fruitful. It rolled out progress for IPTV standardization. However, this effort has a long way to go. Many issues and principal hurdles remain to be resolved for the development of an IPTV standard. A widely recognized and accepted view is that IPTV will become a reality in the coming decades. IPTV will fundamentally change how we will learn to communicate and use entertainment content services. This fact was reflected in the first IPTV Focus Group meeting since it attracted the attention and participation by many leading IPTV companies worldwide.

As a result of this first meeting, we learned that the evolving IPTV services will offer advantages to end users over traditional broadcast-TV services, since IPTV will provide full personalization and interactivity. IPTV also promises integration of content and communication services, as well as converged services across mobile terminals and home devices. IPTV service providers will benefit by having the ability to launch and upgrade service offerings quickly and easily.

The emergence of IPTV as a viable distribution alternative to cable gives

broadcasters an opportunity to develop new revenue streams. IPTV enriched services such as interactive TV, Video/TV on Demand, advertising, etc., provides broadcasters with opportunities and a platform for redesigning content and developing new services.

## IEEE BTS Representation

IEEE BTS active participation proved to be very useful for us to become directly involved with the rapid evolution of IPTV. IEEE BTS participation enables our Society to closely follow IPTV's dynamically changing status and development direction. The IPTV Focus Group meetings provide us, as representatives for the IEEE BTS and broadcast engineers, an opportunity to offer contributions in IPTV relevant fields by submitting research proposals, defining new functionalities and monitoring technical trends etc. IPTV research fields of interest exist in which members of the IEEE BTS and broadcast professionals have the qualifications and experience to make useful contributions including performance evaluation on content codecs, a QoS mechanism, video traffic characterization and management, application layer reliability solution for IPTV, etc. The continuous participation by IEEE BTS representation will certainly bring opportunities for Society members and all broadcast engineers to make significant contributions to IPTV development which can be shared worldwide through the ITU-T.

## Next IPTV Focus Group Meeting

The next IPTV Focus Group meeting will take place in Busan, Korea, 16-20 October, 2006.

## For Additional Information

Please contact Yiyang Wu at [yiyang.wu@crc.ca](mailto:yiyang.wu@crc.ca) and Hong Liu at [hong.liu@crc.ca](mailto:hong.liu@crc.ca)

<sup>1</sup> QoE is the customer's perception of how well a service satisfies user expectations. QoE is a rating of service performance from the user perspective.

# ATSC Developing Transport Stream Verification Document

By Jerry Whitaker, VP Standards Development, ATSC

The Advanced Television Systems Committee (ATSC) is working to finalize a Recommended Practice (RP) on digital television (DTV) transport stream verification. An ATSC RP is a document that states specifications or criteria within advanced television systems that are not strictly necessary for effective implementation and interoperability, but that are thought to be advisable and may improve the efficiency of implementation or reduce the probability of implementation errors. An ATSC Recommended Practice may also specify a preferred methodology for implementation and operation, and may recommend a choice from among alternatives.

Document PS-697, "Proposed ATSC Recommended Practice: Transport Stream Verification," outlines a common methodology for describing transport stream conformance criteria for digital television. This document explicitly describes the elements and parameters of ATSC Standards A/53 and A/65 that should be verified in a transport stream for it to be considered a proper emission. This document does not cover RF, captioning, or elementary streams.

PS-697 has been approved by a letter ballot of the ATSC Technology and Standards Group and will go before the ATSC membership for final approval shortly. If all goes as expected, PS-697 could be approved and finalized before the end of the year.

## About the Document

While ATSC standards strictly define the contents and characteristics of the DTV emission transport stream, there may be a number of interactions and interrelationships amongst various components. Successful tuning and display of programs can be ensured if the transport stream adheres to the applicable specifications. The analysis point for verification is illustrated in Figure 1.

The Proposed Recommended Prac-

tice identifies transport stream issues by type, dividing errors into the general following categories:

- **PSI errors.** An ATSC conformant transport stream is also required to be MPEG-2 conformant. Therefore, an ATSC transport stream must include the two mandatory Program Specific Information (PSI) tables—the Program Association Table (PAT) and the Program Map Table (PMT).
- **PSIP errors.** The Program and System Information Protocol (PSIP) is the glue that holds the DTV signal together. The purpose of PSIP is to describe data at the system and event levels, and to enable an abstract of the collection of programs (a virtual channel).
- **Timing model and buffering errors.** Timing is the key to the MPEG-2 encoding and decoding processes. MPEG-2 defines a model for the system timing,

adherence to which allows independent design of encoders and decoders that can interoperate. An MPEG-2 decoder's 27 MHz reference clock needs to be synchronized with the equipment that is creating the encoded stream.

- **Consistency errors.** Before a receiver can decode a transport stream, it must identify the relationship between components in the stream. Some components contain audio and video (elementary streams), and other components contain information describing the relationship between them (metadata). The receiver uses metadata to identify each component, determine its function, and select an appropriate set of components when the user selects a virtual channel for decoding. Conflicts and problems within the structure of metadata are called 'consistency errors.' Consis-

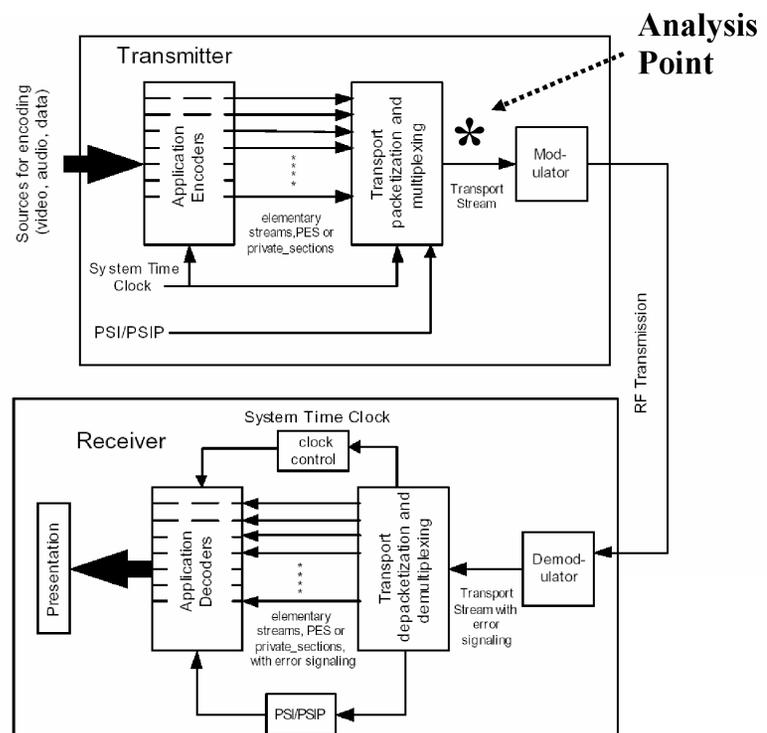


Figure 1 Reference analysis point in the DTV system.

tency errors can result in broken decoding, missing system components (such as closed captioning), and/or missing program guide information.

- **General errors.** These errors cover a variety of types of problems, typically transport-related.

Each error type is provided with a defined “error severity”, as detailed below:

- **Transport Stream Off-Air:** The station is effectively off-air as the transport stream errors are severe enough that transport level logical constructs are damaged beyond utility. Receivers will not be able to tune and decode anything within the broadcast. The complete or repeated absence of sync bytes would be an example of this level of error.
- **Program Off-Air:** A main service (virtual channel) is flawed to the point that that the service is effectively off-air for conformant/reasonable receiver designs. This could involve program elements being improperly constructed or incorrect/missing signaling about

elements. The absence of an entry in the Virtual Channel Table (VCT) for a service would be an example of this type of error.

- **Component Missing:** One of the program components that is signaled by PSIP or the Program Map Table (PMT) as present is either not present or cannot be found and decoded. One example would be a mismatch between the video Program ID (PID) signaled in the Service Location Descriptor (SLD) and the actual PID used for the video elementary stream.
- **Quality of Service:** Parameters are out of specification by such a margin that a significant fraction of the receivers can be expected to produce flawed outputs. In many cases, the broadcast is viewable, but may exhibit some form of degradation to the viewer. An example might be the Master Guide Table (MGT) cycle time being somewhat larger than the specification, which would cause slower than normal channel-change tuning.
- **Technically Non-Conformant:** Violates the letter of the standard,

but in practice will have little effect on the viewing experience. Errors of this type should be corrected, but do not have the urgency of higher severity errors. An example might be a single instance of a 152 ms MGT cycle time (with the remainder of the MGTs coming at less than 150 ms intervals).

The distinctions between these error classifications are important and drove work on the draft Proposed RP. After some study it became clear that a layered approach that indicated the severity of the error would be beneficial within the confines of real-world television station operation. For example, if the threshold for an error was set at strict adherence to the applicable rules—regardless of the ultimate impact at the consumer’s receiver—could lead to such a high false alarm rate that the monitoring equipment would, after a time, tend to be ignored.

As an example, error conditions for the Program Association Table are classified in Table 1.

Work on the Proposed Recommended Practice on Transport Stream Verification was led by Richard Cherno of Triveni Digital.

**Table 1 PAT Error Conditions**

| Error Condition   | Error Qualifier  | TOA | POA | CM | QOS | TNC |
|---|--|-----|-----|----|-----|-----|
| PAT repetition error  | PAT repetition interval error (found between the last 101 and 200 ms) <sup>1</sup> |     |     |    |     | X   |
| PAT repetition error  | PAT repetition interval error (found between the last 201 to 500 ms)               |     |     |    | X   | X   |
| PAT absence error   | PAT not found for 501 ms (or longer)   | X   | X   | X  | X   | X   |
| PAT syntax error  | Packet with PID 0x0000 doesn't have table_id 0x00                                  | X   | X   | X  | X   | X   |
| PAT syntax error  | CRC is incorrect for table_id 0x00 within PID 0x0000 <sup>2</sup>                  |     |     |    |     | X   |
| PAT syntax error  | scrambling_control_field is not '00' for packet within PID 0x0000 <sup>3</sup>     | X   | X   | X  | X   | X   |
| Legend:<br>TOA: TS Off Air, POA: Program Off Air, CM: Component Missing, QOS: Quality of Service, TNC: Technically Non-Conformant   |  |     |     |    |     |     |
| Notes:<br>1) Or over 140 ms with regards to the hard limit of 80 kbps. In A/53, Annex C, Section 5.4 it is noted that in cases where the table section sizes are such that the 100 millisecond repetition rate of the program_association_section() would cause the 80,000 bps maximum rate to be exceeded, the time interval between the byte containing the last bit of the program_association_section() may be increased but in no event shall exceed 140 milliseconds, so that under no circumstances the limit of 80,000 bps is exceeded.<br>2) Repeated instances of an incorrect CRC will be interpreted as the table not being present. This case is equivalent to a repetition or absence error.<br>3) An error in the setting of the scrambling control field is most likely an indicator of a hard failure or incorrect setting and will persist until corrected. |  |     |     |    |     |     |

# A Numerical Millington Propagation Package for Medium and Short Wave DRM Systems Field Strength Predictions

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## Abstract

A groundwave propagation prediction package, based on ray-mode hybridization, tailored with a Matlab-based GUI, that can be used path loss vs. range and/or field strength vs. range predictions along multi-mixed-paths is reviewed<sup>1</sup>.

## 1. Introduction

Ground wave propagation has been, and will continue to be, one of the important options for communication over medium/long distances near the earth's surface. In addition to the classical LF/MF/HF/VHF broadcast and communication systems, emerging HF and VHF radar technologies and/or advanced digital traveler information systems enforce to understand complex propagation characteristics over the Earth's surface along different lossy propagation paths and to develop better and applicable propagation prediction tools. Digital Radio Mondiale (DRM) is one of these new technologies (visit, [www.drm.org](http://www.drm.org) for further information).

Triggered by these requirements, early analytical groundwave propagation prediction methods have been reviewed and a user-friendly, Matlab-based propagation prediction virtual tool has been introduced [1]. The package can be used in field strength and path loss predictions of a transmitter-receiver pair located above smooth, spherical Earth's surface along multi-mixed propagation paths especially at MF and HF bands. Requirements of the field strength prediction for digital sound broadcasting systems are covered by ITU-R Recommendation P-1321 [2] and BS-1615 [3], and points out the usage of Recommendation P-368-7 [4] for the ground-wave field strength prediction in the MW and HF bands. The details of the ray-mode method and Millington

curve fitting approach to predict path loss for multi-mixed path propagation scenarios can be found in [1-4], therefore are not repeated here. Instead, the virtual tool is briefly described and validated against reference data including available measurements.

Groundwaves have three components; the *direct wave* between the transmitter and receiver and the *ground-reflect wave* both of which exist within line-of-sight (LOS), and the *surface wave* which couples to the ground and may reach ranges beyond the LOS into the shadow regions. At MF/HF frequencies, ground wave propagation is dominated by the surface wave. As long as the transmitter and receiver are close to surface direct and ground reflected waves cancel each other and only the surface wave can propagate. The Earth's surface electrical parameters are important in reaching longer ranges. Sea surface is a good conductor, but ground is a poor conductor at these frequencies. A challenging problem is to predict surface wave path loss variations over mixed paths, such as sea-land-sea transitions. A sharp decrease occurs in

signal strength along sea-land transition and the signal recovers itself beyond the island, known as the Millington (recovery) effect [5].

## 2. A Matlab-based Mixed-path Propagation Prediction Tool

The groundwave propagation virtual tool (GPVT) *Millington* predicts field strength and path loss vs. range along a user specified multi-mixed smooth paths [1]. The effects of multi-mixed paths, path-lengths, electrical parameters of each propagation section, as well as the frequency can be observed and extra path losses can be predicted. The front panel of the Millington PVT is shown in Fig. 1, and is divided into three sub regions. The left part of the GPVT is reserved for the user-supplied parameters. The operating frequency, range increment, transmitter height and receiver height are supplied first. Then the number of propagation segments is supplied. Once the number of paths  $N$  is specified  $N$ -editable-textboxes become visible to enable the user to supply the segment-lengths and electrical parameters

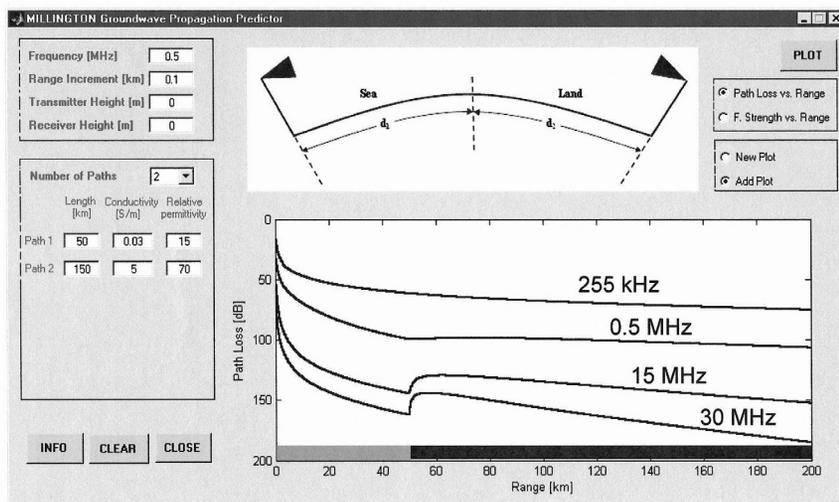
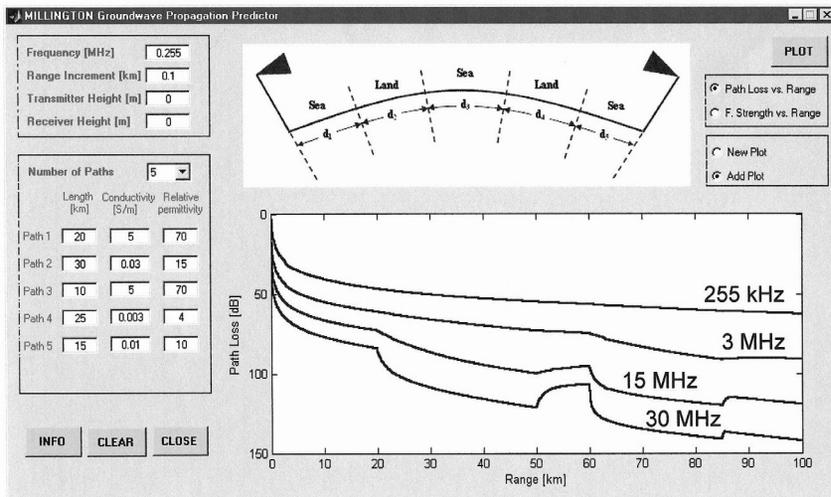


Figure 1: The front-panel of the GPVT with path loss vs. range curves of various DRM frequencies for a two-segment propagation scenario. The first segment is a 50-km “dry land” ( $\sigma = 0.0035 \text{ S/m}$ ,  $\epsilon_r = 15$ ) and the other is a 150-km “sea” path ( $\sigma = 5.0 \text{ S/m}$ ,  $\epsilon_r = 70$ ).

<sup>1</sup> The Millington GPVT can be downloaded from <http://www3.dogus.edu.tr/lsevgi>



**Figure 2: The Millington propagation prediction package and test results for a five-segment 100-km propagation path. The segment lengths are:  $d_1=20\text{km}$ ,  $d_2=30\text{km}$ ,  $d_3=10\text{km}$ ,  $d_4=25\text{km}$ ,  $d_5=15\text{km}$ . The electrical parameters are:  $(\sigma_1 = 5.0\text{S/m}$ ,  $\epsilon_{r1} = 70)$ ,  $(\sigma_2 = 0.03\text{S/m}$ ,  $\epsilon_{r2} = 15)$ ,  $(\sigma_3 = 5.0\text{S/m}$ ,  $\epsilon_{r3} = 70)$ ,  $(\sigma_4 = 0.003\text{S/m}$ ,  $\epsilon_{r4} = 4)$ , and  $(\sigma_5 = 0.01\text{S/m}$ ,  $\epsilon_{r5} = 10)$ .**

(conductivity and relative permittivity) of each segment ( $\mu=\mu_0$  assumed everywhere and the atmosphere is homogeneous). For example, the number of paths in Fig. 1 is 2, so there are 2 visible textboxes.

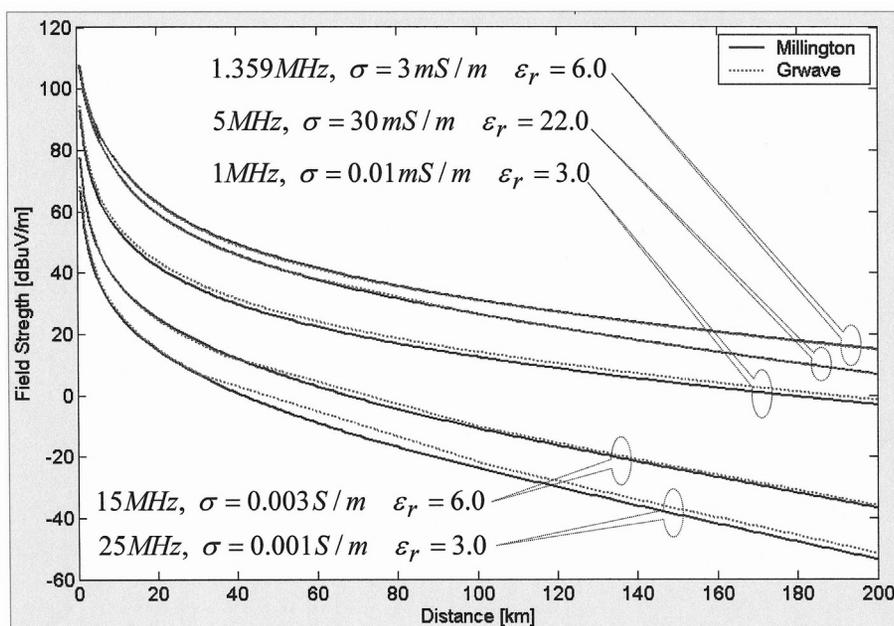
The mid-part of the front panel of GPVT is reserved for the figures. The upper figure shows the geometry of the scenario and changes whenever the number of paths is changed by the user via the corresponding popup menu. The lower figure displays plots for “Path Loss vs. Range” or “Field

Strength vs. Range” variations. The “Plot” button at top-left executes the program. Once executed the user-specified parameters are written line by line to an input file named “MIL.INP”, then the Fortran program MIL.EXE is executed background and the outputs are both displayed in the figure and written to files “MLoss.DAT” and “Mfield.DAT”. Both files consist of 2-columns of data in text format. First columns belong to the range values in km and second columns correspond to Path Losses/Field Strengths in dB.

The check boxes right below are used to select whether to plot the “Path Loss vs. Range” or “Field Strength vs. Range”. Operational parameters may be changed by the user and multi-curve plots may be generated. The user may clear previous plots by using the “Clear button” before the “Plot button”. The control push buttons are located at the bottom-left part of the panel. Pressing the “Info” button opens the MATLAB Help window that includes explanations on how to use the package. Typing “help Millington” at the MATLAB command line also displays the same explanations. The “Close” button terminates the program. The “Clear” button clears the graph.

The scenario given in Fig. 1 presents path loss vs. range curves of various DRM frequencies for a two-segment propagation path. The first segment is a 50-km “dry land” ( $\sigma = 0.003\text{S/m}$ ,  $\epsilon_r = 15$ ) and the other is a 150-km “sea” path ( $\sigma = 5.0\text{S/m}$ ,  $\epsilon_r = 70$ ). As observed, land-sea impedance transition effects can not be distinguished at 255 MHz and is hardly distinguishable at 500 MHz.

Another test scenario is given in Fig. 2. Here, a five-segment, 100-km long propagation path is used with the segment lengths of  $d_1=20\text{km}$ ,  $d_2=30\text{km}$ ,  $d_3=10\text{km}$ ,  $d_4=25\text{km}$ ,  $d_5=15\text{km}$ . The electrical parameters are as given in the figure caption. The curves belong to the predictions at 255 kHz, 3 MHz, 15 MHz, and 30 MHz. At 100-km path loss values at these frequencies are read to be 59 dB, 93 dB, 120 dB, and 140 dB, respectively.



**Figure 3: Comparisons of the GPVT and ITU’s GRWAVE packages as field strength vs. range curves for a single path at various frequencies (Solid: GPVT, Dashed: GRWAVE).**

### 3. Validation Tests with the GPVT

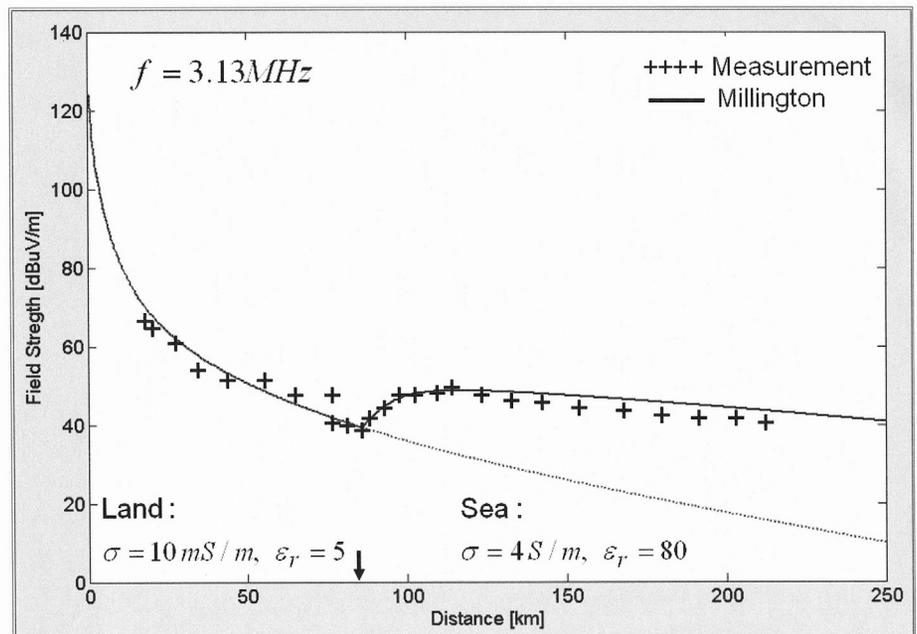
The GPVT introduced in [1] are validated against ITU reference curves as well as the measurement. The first test is against the reference curves presented in ITU recommendations, reproduced via the GRWAVE package (endorsed in ITU-R P-368-7 by ITU which can be downloaded from <http://www.itu.int>). The results are plotted in Fig. 3. A very

good agreement between Millington GPVT and GRWVE at various frequencies and broad range of Earth's electrical parameters is clearly observed and this completes the first validation process.

There are a few experimentations related to the mixed-path propagation effects and the data recorded are very valuable for testing propagation methods and models. One was conducted by Millington himself back in late 1940s [6]. The measurements belong to a 200 km-long propagation path, the first 80 km of which is land and the rest is sea, with the electrical parameters of,  $\sigma = 10.0 \text{ mS/m}$ ,  $\epsilon_r = 5.0$  (land) and  $\sigma = 4.0 \text{ S/m}$ ,  $\epsilon_r = 80.0$  (sea). The average transmit power was 1 kW and the frequency of the experiment was 3.13 MHz. Fig. 4 shows the measurement data in [6] compared with the results produced with the GPVT. The solid and dashed lines in the figure correspond to the land-sea and homogeneous land paths, respectively. Millington proved the recovery effect along mixed propagation paths in [6] and the agreement with the theoretical curves is almost excellent.

## 6. Conclusions

The emerging digital technologies for radio sound broadcasting necessitate tables of reliable field strength vs. range especially at frequencies below a few MHz. Although the only way is to conduct field strength measurements, it is essential to use some kind of computer propagation prediction tools and perform pre-predictions to reduce high measurement costs and long measurement periods. The Millington method used in ITU Recommendations [4] is quite accurate and can be used for this purpose. Unfortunately, its application is quite useless if not automated, since, one must do many readings from the curves and the number of readings



**Figure 4:** The GPVT results against real measurement data conducted by Millington back in late 1940s [6]. The measurements belong to a 200 km-long propagation path, the first 80 km of which is land and the rest is sea, with the electrical parameters of,  $\sigma = 10.0 \text{ mS/m}$ ,  $\epsilon_r = 5.0$  (land) and  $\sigma = 4.0 \text{ S/m}$ ,  $\epsilon_r = 80.0$  (sea). The average transmit power was 1 kW and the frequency of the experiment was 3.13 MHz. The results of the experiments read from [6] point by point (Solid: GPVT, +++: real data).

drastically increases as the number of segments increases. The new GPVT developed by the hybridization of Ray-Mode methods overcomes these problems and automates the calculations. It can be used for any multi-mixed-path surface wave propagation scenario, and effects of multi-mixed paths, electrical parameters of each propagation section, and the frequency on to the range variation of path loss can be simulated easily.

## References

- [1] L. Sevgi, "A Mixed-Path Groundwave Field Strength Prediction Virtual Tool for Digital Radio Broadcast Systems in Medium and Short Wave Bands", IEEE Antennas and Propagation Magazine, (scheduled for) Vol. 48, No.5, Oct 2006
- [2] ITU-R, Recommendations, P-1321, "Propagation Factors Affecting Systems Using Digital Modulation Techniques at LF and MF", International Telecommunications Union, Aug 1997
- [3] ITU-R, Recommendations, BS-1615, "Planning Parameter for Digital Sound Broadcasting at Frequencies Below 30 MHz", International Telecommunications Union, 2003
- [4] ITU-R, Recommendations, P-368-7, "Groundwave Propagation Curves for frequencies Between 10 kHz and 30 MHz", International Telecommunications Union, Mar 1992
- [5] G. Millington, "Groundwave Propagation over an Inhomogeneous Smooth Earth", IEE Proceedings, 96 Part III, p.53, Mar 1949
- [6] G. Millington, G. A. Isted, "Groundwave Propagation over Smooth Earth: Part 2 – Experimental Evidence and Practical Implications", Proc. IRE, Vol.97, Part III, pp.209-221, 1950

# IEEE BTS Japan Chapter Report

by Keiichi Kubota

BTS Japan Chapter had five joint meetings with the Institute of Image Information and Television Engineers (ITE) below during the first half of 2006.

On January 19–20, 2006 at NHK Fukuoka Station, Fukuoka, Japan. There were 19 technical presentations including 10 presentations by young students on general topics for broadcasting technology.

On February 10, 2006 at NHK Hiroshima Station, Hiroshima, Japan. There were 10 technical presentations on mobile and portable reception for digital terrestrial television broadcasting, 120 GHz millimeter wave transmission for multiple HDTV baseband signals, 21 GHz transmission indoor experiment for super HDTV, etc.

On February 24–25, 2006 at Hotel Tsubakien, Oshima, Tokyo, Japan. There were 14 technical presentations including 10 presentations by young students on general topics for broadcasting technology.

On June 23, at Kikai-Shinko-Kaikan Bldg, Tokyo, Japan. There were six technical presentations on general topics for broadcasting technology.

On July 28–29, 2006 at Hokkaido University, Sapporo, Japan. There were 13 technical presentations on general topics for broadcasting technology and one special topic for emergency warning broadcasting system.

The BTS Japan Chapter is planning



Meeting at NHK Hiroshima Station, Hiroshima, Japan Feb., 2006.



Meeting at Hotel Tsubakien, Oshima, Tokyo, Japan Feb., 2006.

to have three joint meetings with the Institute of Image Information and Television Engineers (ITE),

On October 3–4, 2006 in Tohoku University, Sendai, Japan.

On January 16–17, 2007 in Kumamoto University, Kumamoto, Japan.

February, 2007 in NHK Hiroshima Station, Hiroshima, Japan.

## IEEE International Symposium on Consumer Electronics in St. Petersburg

by Dmitry A. Tkachenko, Chair IEEE BTS St. Petersburg Chapter

The Tenth IEEE International Symposium on Consumer Electronics ISCE 2006 was held in St. Petersburg (Russia) on June 28 – July 1, 2006. The organizers of the symposium were the IEEE Russia Northwest (St. Petersburg) Broadcast Technology, Consumer Electronics and Communications Joint Chapter and the St. Petersburg State

University of Film and Television in collaboration with the Motorola GSG-Russia St. Petersburg Office and Magazine 625. The majority of the work for organizing the symposium was accomplished by the ISCE 2006 Organizing Committee chaired by Prof. Konstantin Glasman. He was assisted by volunteers from the International

Program Committee and the International Advisory Committee.

The IEEE International Symposium on Consumer Electronics is one of two major annual events that are held within the framework of activities of the IEEE Consumer Electronics Society. The first event is the IEEE International Conference on Consumer Electronics (ICCE),

which is held in the USA every year (during the last two years it was co-located with the Consumer Electronics Show that is held annually every January in Las Vegas). The second regular event is ISCE, which is held annually in different locations around the world outside of the USA. The idea to hold the ISCE in St. Petersburg arose in 2003 when the IEEE St. Petersburg Joint Chapter of Broadcast Technology and Communications Societies joined the IEEE Consumer Electronics Society. The proposal became reality due to help of colleagues from the IEEE Consumer Electronics Society and the enthusiastic work of local IEEE volunteers.

This year's symposium was a great success! The ISCE 2006 program included 140 accepted papers that were selected by program committee from more than 200 submissions. The authors of the papers came to the symposium from 22 countries located in Asia, Europe, America and Australia. Korean authors submitted 44 accepted papers. Russia was second with 23 accepted papers and third was Taiwan with 11 papers. The symposium included 14 sessions that were held in four parallel tracks. Papers presented at the symposium represented the newest research and development results in the field of Consumer Electronics. The ISCE session titles reflected the many hot topics in this field – Automotive and Home Electronics, Home Networks, Multimedia, Video Compression, Mobile Application, Television Application, RF & Wireless, Digital Rights Management, etc.

The symposium was preceded by tutorial on mobile television. The technical part of the tutorial related to DVB-H and IP Datacast. This tutorial was delivered by Prof. Ulrich Reimers, head of the DVB Technical Module. Part of the tutorial related to content creation for mobile and interactive TV was delivered by experts from the St. Petersburg State University of Film and Television. Two keynote speeches



**BTS volunteers together with IEEE Consumer Electronics Society President at the IEEE membership table. From left to right - Dmitriy Efremov (student), Dmitry Tkachenko (St.Petersburg Chapter Chair), Hans Baumgartner (President of IEEE CE Society), Nikolay Kornet (Ph.D. student)**

were delivered during the symposium opening ceremonies – by IEEE Consumer Electronics Society President Hans Baumgartner and by Prof. Ulrich Reimers. They gave their vision of the history and the future of television.

During the symposium banquet, the Engineering Excellence Award was presented to Prof. Mark Krivocheev, a prominent Russian scientist who has



**IEEE torte presented at the symposium banquet by St.Petersburg State University of Film and Television. >From left to right - Konstantin Glasman (ISCE 2006 Chair), Robin Bradbeer (ISCE 2005 Chair), Alexander Belousov (Rector of St.Petersburg State University of Film and Television) and Hans Baumgartner (President of IEEE CE Society).**

made significant technical contributions to the development of TV broadcasting in Russia and the world. He is the author of more than 350 research and technical publications in the field of TV broadcasting including 90 patents. Prof. Krivocheev had served as Chairman of Study Group on TV Broadcasting in the International

Telecommunication Union for more than 30 years. As Chief Scientist of the Russia Radio Research and Development Institute, he led many large-scale R&D projects. Prof. Krivocheev was previously honored as a recipient of the most prestigious Russia State Award. He also serves as Chair of the IEEE Russia Broadcast Technology Chapter located in Moscow.

A special award for outstanding achievements – The Engineering Leadership Award was presented to Vice-President of the IEEE Consumer Electronics Society Stefan Mozar who initiated the tradition of holding ISCE symposiums ten years ago and led this tradition to year's symposium outstanding success. Authors of the three best ISCE 2006 technical papers and authors of the three best student technical papers were also honored with corresponding awards.

Volunteers and members of the IEEE Broadcast Technology Society actively participated in the symposium. A welcome reception was held on June 28 that was co-sponsored by the IEEE Broadcast Technology Society. BTS volunteers staffed the IEEE membership table together with colleagues from the IEEE Consumer Electronics Society.

Participants of the ISCE 2006 symposium enjoyed a cultural program that included a tour of the night in St. Petersburg (which is especially impressive during White Nights) and an excursion to the Hermitage (the palace and art collection of Russian emperors, one of the most famous museums in the world). A number of photographs from ISCE 2006 symposium are available at the symposium Web site [www.isce2006.ru](http://www.isce2006.ru).

Next year, the ISCE2007 symposium will be held on June 20 – 23, 2007 in Dallas, Texas (it will be the first ISCE in the USA), so it may be a convenient option for many BTS members to participate in this symposium. Information about next year's symposium is available at [www.isce2007.dallascscs.org](http://www.isce2007.dallascscs.org).

# IEEE St. Petersburg BTS Chapter Extends Congratulations to Alexander Artamonov

by Dmitry A. Tkachenko, Chair IEEE BTS St. Petersburg Chapter

Dr. Alexander Artamonov, Deputy Director of the MART Company and an active member of St. Petersburg BTS Chapter (Russia), celebrated his 70th birthday on July 1, 2006. In 1962, he graduated from the Leningrad Institute of Aerospace Instrumentation and started working as an engineer at the Comintern Company that was the country's leading manufacturer of radio transmitters. Since then, he has published more than 100 research and technical papers related to different types of radio transmitters. He holds 18 patents that were implemented in commercial products. In 1980, the Ministry of Communications Industry appointed Alexander Artamonov as Chief Engineer for development of frequency synthesizers and transmitter exciters. The equipment developed under his leadership was manufactured at numerous factories throughout the country. In 1987, Alexander Artamonov obtained his Ph.D. degree in the field of Radio Communications. In 1990, he was honored with the prestigious State Prize Award. The State Prize awards are conferred every year by the government of Russia to several individuals or groups of individuals for outstanding achievements in the field of science and engineering. Since then Alexander Artamonov has directed more than 20 large-scale research and development electronics projects.

During the middle of the last decade, Alexander Artamonov participated in



**Dr. Alexander Artamonov**

establishing the MART Company, which is one of the successors for Comintern Company. MART is currently one of the leading manufacturers in Russia for TV and radio broadcast transmitters. Alexander is an enthusiastic supporter for the introduction of digital TV and radio broadcasting in Russia. He served as the Chief Engineer for development of the first Russian digital TV transmitters. These digital TV transmitters, manufactured in 2001, continue operating in several pilot DTV areas located in Russia and other countries. Alexander Artamonov actively participated in the development work on Russian digital TV broadcasting regulations and technical standards. He is currently working on developing DRM radio broadcast transmitters. Alexander is also leading projects for the development of

advanced radiolocation stations.

Alexander Artamonov joined the IEEE and BTS in 1997. He has been an active member and an organizer of the St. Petersburg BTS Chapter since its founding in 1998. He organized many BTS Chapter technical meetings held at the MART Company. Alexander also invited many outstanding Russian and foreign experts to speak at the BTS Chapter events. Their participation made it possible for the BTS Chapter to host a series of high-quality meetings devoted to the development and introduction of new digital TV and radio broadcast technologies. Alexander is a member of Popov Society (Society of Russian Radio and Electronic Engineers similar to IEEE). He is also the organizer and the leader of an informal association of St. Petersburg industrial companies, universities and research institutes known as the St. Petersburg Digital Video Technology Group. This Group coordinates the activities of St. Petersburg industry and academia for the development and introduction of digital TV and radio broadcast technologies.

Members of the St. Petersburg BTS Chapter congratulate Alexander on his 70th birthday. We wish him many new outstanding accomplishments in his professional work and look forward to his continuing active participation in the activities of the St. Petersburg IEEE BTS Chapter.

## Congratulations to the BTS Member who was recently elevated to Senior Member Grade!

**Ted Olawuyi**

**IEEE Dallas Section**

IEEE Senior Members are honored members of the IEEE organization. We hope you will consider joining the ranks of Senior Members. IEEE Bylaw I-105.3 sets forth the criteria for elevation to Senior Member Grade, as follows:

*"...a candidate shall be an engineer, scientist, educator, technical executive or originator in IEEE-designated fields. The candidate shall have been in professional practice for at least ten years and shall have shown significant performance over a period of at least five of those years."*

When you become a Senior Member, you will receive a bronze and wood plaque, a letter to your employer (upon request) \$25

towards a new Society Membership, the recognition of your peers, and the opportunity to become an executive IEEE volunteer. If you would like to become a Senior Member and need some help, please contact your IEEE Section Chair, or BTS Senior Administrator, April Monroe at [a.monroe@ieee.org](mailto:a.monroe@ieee.org).

# 2007 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting

March 28 – 29, 2007 Orlando, Florida, USA  
Co-located with the IEEE events at CTIA including the  
2007 IEEE International Conference on Portable Information Devices

## Call for Papers

The IEEE International Symposium on Broadband Multimedia Systems and Broadcasting 2007 (Broadband Multimedia 2007) is an industry oriented premier forum for the presentation and exchange of technical advances in the rapidly converging areas of multimedia broadcasting, telecommunications, consumer electronics, and networking technologies. This symposium, the second in the series, will bring together leading engineers, researchers, and service providers around the world to present and discuss the state-of-the-art research results and challenges in application and implementation of mobile and broadband multimedia systems.

**The symposium seeks technical papers on the following topics:**

1. Multimedia systems
  - 1.1 Mobile TV
  - 1.2 IPTV
  - 1.3 Broadband multimedia systems
  - 1.4 Datacasting and interactive systems
  - 1.5 Field trials and test results
  - 1.6 Service deployments
2. Transmission technology
  - 2.1 Channel coding, modulation and multiplexing
  - 2.2 Signal processing
  - 2.3 Propagation and coverage
  - 2.4 Cognitive radio and software defined radio
3. Multimedia Signal processing
  - 3.1 Audio technology
  - 3.2 Video coding and processing
  - 3.3 Quality assessment
  - 3.4 Content protection and watermarking

Prospective authors are invited to submit extended abstracts of about 1000 words by e-mail to [multimedia@ieee.org](mailto:multimedia@ieee.org). Each abstract must include at least two key words to indicate its topic by choosing one of those mentioned above. *Please indicate that the abstract is submitted to the IEEE International Symposium on Broadband Multimedia Systems and Broadcasting 2007.* Include the corresponding author's full name and contact information including: Affiliation, address, e-mail, and phone number.

### Important dates:

|                                   |                   |
|-----------------------------------|-------------------|
| Submission of extended abstracts: | October 15, 2006  |
| Notification of acceptance:       | December 16, 2006 |
| Submission of full papers:        | February 15, 2007 |



# REMINDER - re IEEE Fellow Nominating Process Revisions — with Application Engineer / Practitioner category added

The purpose of this article is to remind all IEEE members of the changes in the IEEE Fellow nomination process that have taken place over the past several years, mainly in the effort to generate more Fellow nominations from industry.

Changes were initiated in 2003 - to the Fellow process - and to the appropriate IEEE By-Laws - to assure equal opportunity for election to IEEE Fellow grade of members with careers involving the application of technology. The changes actually took effect for the Fellow class of 2005.

The IEEE Bylaws were amended to clarify the eligibility of Application engineers and Practitioners, and to establish the realization of the significant value to

society standard for evaluating nominations. Fellow candidates are now classified as - Application Engineer / Practitioner, Research Engineer / Scientist, Technical Leader, or Educator.

Another important step in modernizing the Fellow nomination process is that the nomination forms and instructions are available on the IEEE Web site - and that the nomination forms can now be submitted electronically. See the IEEE Web site at ([www.ieee.org/fellow](http://www.ieee.org/fellow)).

Although electronic submittal of Fellow nominations is highly recommended, and is the preferred method of submittal, the forms and instructions are also available in hard copy (via E mail to "fellow@ieee.org"). Nomination forms are able to be sub-

mitted in either "hard copy", or electronically via the WEB. The Class of 2007 Fellow nomination cycle ends March 1st, 2007.

All questions on the Fellow nomination process - or general Fellow questions should be referred to the IEEE Fellow staff - E mail - "fellows@ieee.org".

IEEE Fellow grade membership is bestowed by the Board of Directors on IEEE Senior Members with an extraordinary record of accomplishment in any IEEE field of interest. The accomplishments honored shall have contributed significantly to the advancement of engineering, science and technology, bringing the realization of significant value to society.



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### IEEE International Symposium on Broadband Multimedia Systems & Broadcasting

Wednesday, 28 – Thursday, 29 March 2007  
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### IEEE International Conference on Portable Information Devices

Sunday, 25 – Tuesday, 27 March 2007  
[www.ieee-portable.org/2007](http://www.ieee-portable.org/2007)



**IEEE Mobile WiMAX Symposium**  
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### Preliminary Schedule

#### **Wednesday, 27 September**

IPTV Tutorial

IPTV, Mobile TV, and Multimedia Technologies

#### **Thursday, 28 September**

Digital TV Systems & Standards

Unlicensed Devices in the TV Broadcast Bands

#### **Friday, 29 September**

Distributed Transmission Systems

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