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IEEE

Broadcast Technology Society Newsletter

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

From the President

William T. Hayes, President, IEEE Broadcast Society

Greetings BTS members. The last few months have been very busy for the society. We hosted a very successful Multimedia Symposium on 31 March through 2 April. We followed it up a few weeks later with a very well attended tutorial on the technologies that are vying to be selected as the mobile/handheld standard for inclusion in ATSC digital broadcast standard. If everything goes as planned by the time you are reading this column the ATSC will have already made the selection and the industry will be mobilizing to get everything finalized so that mobile technologies can start being deployed when the United States ceases full powered analog broadcasting in February of 2009. There is a tremendous amount of interest and excitement within all areas that the BTS serves regarding these technologies and their potential to revolutionize and reinvigorate the broadcast industry. I don't know if I have ever seen so many different segments of different industries work so closely and so quickly to achieve a goal.

On 8 May 2008 I had the pleasure of attending the ATSC annual meeting in Washington, DC. This was an especially important meeting since in addition to reporting the amazing progress that has been made on the M/H standard; it was also the 25th anniversary of the ATSC. I had the honor of accepting a plaque presented to the BTS for being one of the founding organizations that started the ATSC. It was for me an amazing opportunity to be in

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From the Editor

William Meintel, BT Newsletter Editor

This was another banner year for the BTS at NAB 2008. The BTS sponsored another great tutorial that was, as usual, very well attended. The big turnout for this tutorial is no surprise since the topic, Proposed ATSC Mobile/Handheld (M/H) Systems, seems to be the hottest thing in U.S. TV at the moment. As I mentioned in my previous column this technology is on a fast track since the broadcasters believe that they have a narrow window of opportunity in this area. Since NAB 2008, the direction of this technology has taken a major leap forward as proponents of two of the major competing technologies have agreed to merge and move forward with a single proposed system. Although, these were not the only proposed technologies they were obviously the front runners. As we move into summer, more M/H system field testing is anticipated looking toward the adoption of a standard and system deployment shortly after the U.S. makes the final tran-

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58th ANNUAL IEEE BROADCAST SYMPOSIUM

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sition to all digital over-the-air television broadcasting in February 2009. Many thanks to Tom Gurley for putting the tutorial together and as usual the BTS support staff for their efforts.

NAB 2008 also saw two of our own, Tom Silliman (Radio) and Tony Uyttendaele (Television), receive the NAB Engineering Achievement Awards. These awards have been presented annually since 1959 to honor individuals who have made outstanding achievements and contributions to the radio and television sectors of broadcast engineering profession. You will find a bit more inside about the awards. In addition, Tom Silliman is also the subject our continuing series of BTS member profiles. Congratulations to both Tom and Tony on their awards.

The 2008 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting technical program was put together by Tom Gurley, technical program chairs Yiyan Wu and Demin Wang, plus a large group of other BTS volunteers. The Symposium's theme this year was "Multiple Technologies for Multimedia" It is now in its 3rd year and continues to grow. Although I was unable to attend this year I understand that it was a tremendous success with a large number of very informative presentations from a truly international group of authors. This year's Symposium was held in Las Vegas just a couple of weeks prior to NAB but, in keeping with its international scope, next year it will be held from 13 -15 May 2009 in Bilbao, Spain.

If you have not figured out by now, my day job is mainly focused on the television sector of our industry. However, I do have some involvement in other areas and would like to mention that although television and the DTV transition seems to be taking center stage here in the U.S. there are also new and exciting developments and opportunities in radio as well. In that vein, I am attempting to get some articles for future issues on the latest developments in AM and FM IBOC and what that technology offers to radio broadcasters and the listening public.

Although this "summer" issue will reach you before the first day of fall, it should have arrived much earlier and I must take full responsibility for the delay. It is the price we all pay with a volunteer organization where rightfully the volunteers' day jobs take priority. I do expect this to improve as we have gotten past some of the major "crunches", at least for us planners, of the DTV transition. On that note I take my hat off to all those volunteers including our contributors who do deliver on time.

In some cases our volunteers have no choice but to deliver on time as for example the BTS Fall Symposium. This year, the IEEE 58th Broadcast Symposium will be at a new venue that also happens to be a new hotel in Alexandria, VA. Our planners are hard at work to make this the best ever which is a tall order considering the past history. This is an event that you need to attend. What you come away with is more than worth the cost and the time spent. You not only get presentations about the cutting edge issues facing our industry, but over the course of the three days, you also have the opportunity to meet face-to-face and talk to the presenters as well as the many other attendees who are in many cases deeply involved in all of these activities. It is an outstanding learning experience and a great networking opportunity. The dates are 15-17 October 2008 - Sign up today!

Once again our contributors and staff have helped us produce I believe another great issue – But your opinion is really what counts so let me know what you think.

Bill Meintel
Editor
wmeintel@computer.org

Newsletter Deadlines

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

Issue	Due Date
Winter, 2008	20 October, 2008
Spring, 2009	20 January, 2009
Summer, 2009	20 April, 2009
Fall, 2009	20 July, 2009

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the same room with some of the most brilliant and visionary minds of our industries. What is even more incredible is that many of the people that have contributed and continue to contribute to the ATSC standards process are members of the BTS AdCom. Among the AdCom members were Yiyan Wu, who in addition to all of his other duties and responsibilities, serves as the BTS representative on the ATSC board and was heavily involved in the recent testing of the M/H systems. Also on hand was Guy Bouchard who in addition to his work on ATSC TSG's is also the program chair for the BTS' own Broadcast Symposium that will take place in the Washington, DC area in October. Thanks to the clever thinking by BTS Senior Administrator Kathy Colabaugh and Publications Administrator Jennifer Barbato, we had a table stocked with candy bars that had the BTS logo on them. I witnessed Guy handing out candy bars and copies of the call for papers for the Symposium using the phrase, submit a paper…get candy. Jules Cohen was also present at the meeting which is extremely appropriate since he has been there since the beginning of the ATSC. Overall, it was an exciting event that celebrated the accomplishments of the ATSC and laid out the strategic plan for the next steps in the evolution of the DTV standards.

The Broadcast Technology Society took another pioneering step last year when the IEEE Engineering Management Society was transformed to the Technology Management Council and BTS became one of the sustaining societies. One of the prime functions of the BTS is to provide the members with information and knowledge that will help members develop and grow in their profession. Increasingly though we see where just learning more about the technology isn't enough and technical professionals are being pressed into positions where in addition to their technical knowledge they need to have skills for managing priorities, projects and people. Since the need for development in these areas is not limited to the technical boundaries of any one society, the IEEE Technology Management Council provides tools to enhance your career and organizational effectiveness. The TMC can keep you current with managerial, business, and entrepreneurial thinking whether you are an executive, an aspiring manager, a technical professional, or student. As you can see, this is an extremely ambitious undertaking but an extraordinarily important one since healthy growth requires balanced development. I would encourage all BTS member to visit the TMC website and see how the council can help you grow.

Bill Hayes
hayes@iptv.org

58th Annual IEEE Broadcast Symposium

By Guy Bouchard, Symposium Chair and Ed Williams, Technical Program Chair
The Westin Hotel in Alexandria, Virginia
15 – 17 October, 2008

"Managing the Transitions"

Luncheon Speakers include Richard E. Wiley and Peter M. Fannon

This year, the BTS 58th Annual IEEE Broadcast Symposium breaks a few traditions. First, the event is moving to a new location, it will be held at The Westin Hotel in Old Town Alexandria, Virginia: about 5 miles or 6 metro stations from the Hotel Washington in downtown DC where the event was traditionally held.

Secondly, the event will now offer Continuing Educations Units (CEU) for attending the technical sessions. Most consultants and PE's know that those are often required to maintain professional engineer licenses. Please feel free to request the CEU accreditation when you register for the conference.

The symposium will also include some application-oriented papers such as IP for broadcasters, transport stream management and other subjects of interest to field engineers.

This year the luncheons are aimed to interest, enlighten, and entertain in whatever order those attributes may apply. The Symposium team managed to convince two industry legends for speakers (see biographies below). Richard Wiley, head of top communication law firm Wiley Rein, former FCC chairman, former chairman of the FCC committee on advanced television and so much more, will be our keynote speaker for the Joint AFCEE/ IEEE BTS luncheon on Thursday, 16 October. For our Awards Luncheon on Friday, 17 October, Mr. Peter M. Fannon, VP Technology Policy for Panasonic US, former president of Advanced Television Test Center (ATTC), and chair of CEA Government Affairs Council will share with us his unique perspective on the past and the future of digital media.

The technical program is under construction under the leadership of Ed Williams, Technical Program Chair, and will with no doubt raise more interest than ever. Included in the technical program this year will be papers based on the theme "Managing the Transitions."

These include transitions in analog and digital radio and television broadcasting, technical aspects of the termination of analog television broadcasting in the US next year, how IP becomes more involved in broadcasting, how handheld and mobile applications and standards will evolve for broadcasting, and a

series of academic papers aimed at increasing familiarity with new technological developments not directly related to broadcasting as we know it. A full program will be provided in the next edition of the Newsletter.

Mark your calendar: This year symposium will be held from 15- 17 October, 2008 at The Westin Hotel in Alexandria, Virginia

Biographical Sketches of the Broadcast Symposium Luncheon Speakers

Richard E. Wiley

Partner

Wiley Rein, LLP

Washington, D.C.

Mr. Wiley heads the firm's 80-attorney Communications Practice, the largest in the nation. As Chairman of the Federal Communications Commission (FCC) from 1970-1977, he advocated increased competition and lessened regulation in the communications field.

Mr. Wiley played a pivotal role in the development of HDTV in this country, serving for nine years (1997-1995) as Chairman of the FCC's Advisory Committee on Advanced Television Service (ACATS). In that position he brought the major players together to produce the broadcast standards and set the stage for HDTV. As a result he was called the "Godfather of HDTV" by MediaWeek.

He represents a number of major communications-oriented organizations, including Verizon, AT&T, Newspaper Association of America, Motorola, Viacom/CBS, Belo, Gannett, Sirius Satellite Radio, Emmis, Gray Television, LG and Toshiba America.

Mr. Wiley received an Emmy from the Academy of Television Arts and Sciences in 1997 also is a frequent author and lecturer on telecommunications and information law.

Legal Times in 2007 called him the Washington, DC area's "Leading Communications Lawyer." He is considered "One of Washington's Top 30 Lawyers" by Washingtonian magazine, which recognized him as "a force in developing both policies and technologies."

Mr. Wiley was awarded a B.S., with distinction, from Northwestern University, a J.D. from Northwestern University School of Law, a LL.M. from Georgetown University Law Center, and an Honorary Doctor of Laws from The Catholic University of America in Washington, DC.

Peter M. Fannon

Vice President

Technology Policy, Government & Regulation

Panasonic Corporation of North America

Since joining Panasonic in 1997, Mr. Fannon directs government and legislative affairs for Panasonic that also include environmental, product safety and regulatory compliance activities. In addition, he helps coordinate the company's technology development and evaluation activities associated with new products and services.

Mr. Fannon represents Panasonic in a variety of industry, trade, and advisory organizations. He chairs the Government Affairs Council of the Consumer Electronics Association (CEA) and serves on the CEAPAC Committee.

In 1987, Mr. Fannon set up and was President of the Advanced Television Test Center (ATTC), the official laboratory for testing new TV broadcast systems submitted to the Advisory Committee on Advanced Television Service (ACATS) of the Federal Communications Commission (FCC). He also chaired the HDTV Coalition of Industry, Trade, and Consumer Organizations to promote FCC and industry adoption of the ATSC Digital Television standards.

Mr. Fannon also served in public television as President, National Association of Public Television Stations (NAPTS), which he helped establish in 1980, as the research, planning, and government affairs organization for public TV. Before that he was Director of Planning for the Public Broadcasting Service (PBS), working on development of new program services, network-station organization, and fundraising.

In 2005 and 2006, he received Consumer Electronic Association's (CEA) Academy of Digital Television Pioneers Award for "Best Industry DTV Leadership."

He earned Bachelor and Master of Arts degrees in International Relations from The Johns Hopkins University and its School of Advanced International Studies (SAIS). He is a member of several professional associations, and is a Fellow of the Society of Motion Picture and Television Engineers (SMPTE).

For more information on this event, please visit our website: www.ieee.org/bts/symposium

Broadband Multimedia Symposium Draws Record Attendance

The 2008 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (Broadband Multimedia 2008) – the third annual edition of this event – convened in Las Vegas on 31 March – 2 April, co-located with the CTIA Wireless 2008 trade show. Expanded from two days to three this year, the Symposium drew 130 attendees from more than 25 countries, about half of whom were participants on the program.

The oral sessions featured 52 presentations, and the poster session included 32 papers. These were selected from a record number of 140 abstracts submitted, for an acceptance rate of 60 percent. The abstracts came from 29 countries and regions. About two-thirds of the submissions were from universities, and one third came from industry and research institutions.

Next year's Broadband Multimedia Symposium will be hosted by AdCom member Pablo Angueira in Bilbao, Spain. It will be held 13-15 May, 2009.

Jerry Whitaker, ATSC VP of Standards Development, moderated the Monday AM panel discussion on ATSC Mobile and Handheld Systems.

The Monday AM Opening Plenary Session attracted the Symposium's largest audience.

The jazz trio, "Nova," provided entertainment for the Monday evening Welcome Reception, which featured a light buffet dinner.

Lap-Pui Chau, Jonathan Loo, John Cosmas and Hsiao-Chun Wu

Symposium Chair Tom Gurley chats with new BTS AdCom member and IEEE Fellow Jinyun Zhang at the Welcome Reception.

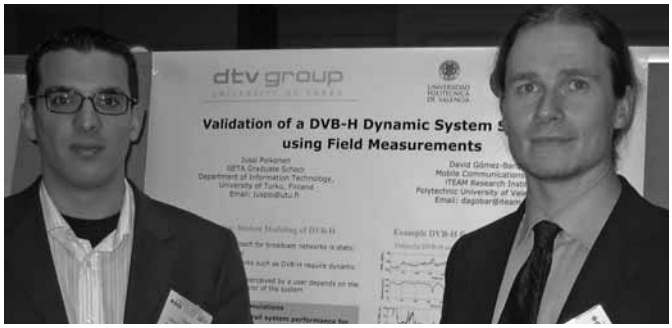
Sebastian Egger, Harald Fuchs and Joerg Deigmoeller

(l-r) Jani Vare, David Gomez Barquero, Maurizio Murroni, Tero Jokela, Jussi Poikonen, Adrian Hornsby, and Heidi Himmanen share some dinner and try to recover from jet-lag.

Liz Behrens, Shaun Luong, Youssef Nasser, Irene Masinjara Mahafeno, and Oudomsack Pierre Pasquero

Kathy Colabaugh - BTS Sr. Administrator, Alicia Zupeck - IEEE Conference Coordinator, Samina Hussain - BTS volunteer, and Jenn Barbato - BTS Publications Coordinator, enjoy a relaxing moment at the Monday evening Welcome Reception.

David De La Vega, Marina Aguado, Carlos Fernandez and Pablo Angueira



David Gomez Barquero and Jussi Poikonen share their research.

Alejandro Lopez and Heidi Himmanen

Dr. Kamil Grajski, Qualcomm Vice President of Engineering and President of the FLO Forum, was the keynote speaker at the Tuesday luncheon. His talk was entitled, "The Expanding Global MediaFLO Ecosystem."

BTS hosts the First Face to Face Meeting of the BTS Publications Committee Members

The Editorial staff of the IEEE Transactions on Broadcasting, many of whom also served on the Symposium's Technical Program Committee, met on two evenings during the Symposium. Pictured are: 1st row: Tom Gurley, Pablo Angueira, Yiyan Wu, Markus Kampmann, Jenn Barbato, Shuji Hirakawa 2nd row: Jong-Soo Seo, Junghwan Kim, Hui-Ling Lou, Jinyun Zhang, Hsioa-Chun Wu, Xianbin Wang, John Cosmas 3rd row: Ed Williams, Demin Wang, Lap-Pui Chau, Tino Trainotti.

The IEEE Broadcast Technology Society Publications Committee invited all the Editorial Staff and management associated with the IEEE Transactions on Broadcasting and the BTS Newsletter to attend an inaugural "Face to Face" meeting in Las Vegas, NV held during the evenings of 31 March and 1 April 2008. This first BTS Publications Committee meeting was held in conjunction with the 31 March 2 April BTS sponsored "IEEE Broadband Multimedia Symposium."

Dr. Yiyan Wu, Editor-in-Chief of the IEEE Transactions on Broadcasting organized and chaired this meeting. The meeting was well attended and included 15 of the 20 Associate Editors for the IEEE Transactions on Broadcasting.

This event provided many of the attendees from various geographic locations with an opportunity to meet for the first time and share ideas related to BTS Publications activities. The two evening meetings were highly productive consisting of wide ranging discussions about BTS Publications improvements, new initiatives, and best practices. Overall, this event was extremely beneficial for all attendees both in getting to know each other and sharing ideas for future improvements to the IEEE Transactions on Broadcasting and the BTS Newsletter.

It is expected that future BTS annual face-to-face Publications Committee meetings can be held as part of a continuing process of improving and expanding BTS publications products which will better serve the practical and academic educational needs of BTS members and other readers worldwide.

The Transactions Associate Editors enjoyed a Japanese hibachi-style dinner after their Tuesday evening meeting.

Delicious food and great Company

IEEE BTS Sponsors Global Wireless Education Consortium (GWEC) Summit at Rose-Hulman Institute of Technology in Terre Haute, Indiana

By Eric Wandel, Wavepoint Research, Inc.and BTS Strategic Planning Chair

The Global Wireless Education Consortium (GWEC) held a Summit on 7 March 2008, at Rose-Hulman Institute of Technology (RHIT) in Terre Haute, Indiana. There were 75 attendees including students, faculty and industry representatives.

GWEC (http://ece-2.rose-hulman.edu/gwec) is a collaboration of more than 60 colleges and universities worldwide that offer two and four-year degrees. In addition to academia, industry partners include companies such as Verizon Wireless and Sprint/Nextel. The consortium is focused on expanding wireless technology curriculum in academic institutions worldwide. The 10-year-old consortium is operated at Rose-Hulman under the direction of GWEC Chief Operating Officer Fred Berry, who is a professor and head of Rose-Hulman's Department of Electrical and Computer Engineering.

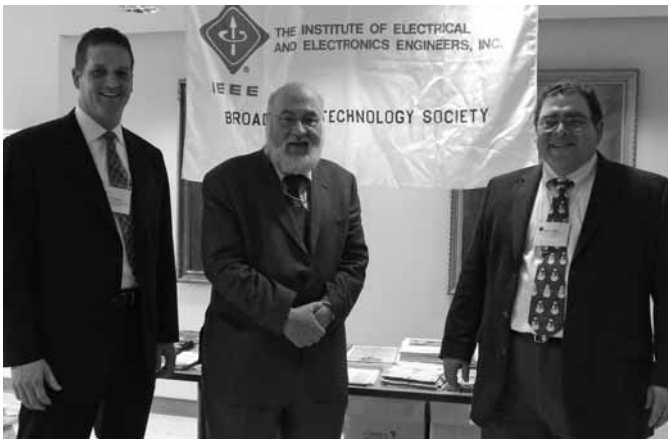
Following an introduction and welcome by the RHIT President, Dr. Gerald Jakubowski, the keynote address was delivered by Dr. Dale Hatfield of the University of Colorado. Dr. Hatfield has recently served as chief technologist and then chief of the Office of Engineering and Technology at the Federal Communications Commission (FCC). He formerly was chief of the Office of Policy Analysis and Development at the National Telecommunications and Information Administration (NTIA), and acting assistant secretary of commerce for communications and information and administrator of NTIA.

In Dr. Hatfield's keynote address, he emphasized the need for better spectrum policy and planning, and he highlighted a course he teaches on Telecommunications Spectrum Management. He described the major functions of spectrum policy planning as being allocation, service rules, assignment and compliance/enforcement.

Other presentations included:

- A presentation by Dr. Don Millard from Rensselaer Polytechnic Institute (N.Y.) discussing Mobile Studio cards, a classroom electronics device that allows experimentation with waveforms and time/frequency measurement functions without the need for expensive test equipment.
- A presentation by Dr. Wayne Padgett from Rose-Hulman discussing the need for being aware of fixed-point versus floating-point algorithms when designing signal processing functionality for application on various digital signal processing (DSP) platforms. Dr. Padgett published an article for the 12th Signal Processing Education Workshop in 2006 titled "Teaching Fixed-point Algorithm Development in a Systems Context." This article can be found on IEEE Explore.
- A presentation by Joshua Kaserman and Joshua White from the State University of New York Institute of Technology concerning work they did to develop and deploy the municipal wireless network for the city of Utica, New York.
- A presentation by Dr. Edward Wheeler of RHIT on "Electromagnetic Measurement and Modeling."
- A presentation by Dr. Bruce Black of RHIT on a "Course in Wireless Systems Engineering." Black was recognized in 2004 as GWEC's Educator of the Year for his scholastic achievements in wireless communications technology.

The Mobile Studio modules contribute to wireless technology education and are available via the Internet at (http://mobilestudio.rpi.edu); they were developed for and distributed by GWEC, according to Berry. The learning modules are a software product that features multimedia simulations about engineering principles and how laboratory equipment can be used. Rose-Hulman faculty have



Shown in front of the IEEE BTS display are Eric Wandel, Dr. Dale Hatfield and Dr. Fred Berry.

IEEE BTS Sponsors GWEC Summit.

collaborated with the Academy of Electronic Media at Rensselaer Polytechnic Institute to create the animation and other features for the modules.

The IEEE Broadcast Technology Society (BTS) was a sponsor of the event. Eric Wandel, IEEE BTS AdCom member, attended the Summit and addressed the gathering by giving an overview of the IEEE as well as the activities of the BTS, especially as related to the wireless communication topic areas of interest to GWEC.

The tentative dates for the next GWEC Summit are 2-5 April, 2009, on the campus of Rose-Hulman Institute of Technology.

(This article was assembled by Eric Wandel. Portions of this article were adapted from a news article appearing on the Rose-Hulman Institute of Technology website at the following address and accessed on 6 May 2008: http://www.rose-hulman.edu/news/articles/2008GWEC.htm)

Tom Silliman Awarded 2008 NAB Engineering Achievement Award for Radio

Tom Silliman, IEEE BTS member and AdCom Secretary, was honored by the National Association of Broadcasters (NAB) with the prestigious 2008 Engineering Achievement Award for Radio. Since 1959, this award has been presented annually by the NAB, to recognize an individual for outstanding accomplishments that have significantly advanced the state of the art of broadcast engineering.

In his acceptance speech, Tom said "I am very proud to receive this award. This award is especially meaningful to me because in 1993 my father, Robert Silliman, was also honored with this award. Robert Silliman was father, business partner, mentor, teacher and the best friend I ever had."

This is the fisrt time this award has honored both a father and son since 1959 when the NAB began presenting the award. As long as he can remember Tom always wanted to be an engineer like his father. Tom said in his speech "I realized a long time ago that it was an impossible goal, so instead my goal has been to be the best engineer that I could be, because it would be impossible to fill Robert Silliman's shoes."

When Tom was 14, his Dad said it was time for him to start his career. He went to work in downtown Washington, DC for Jack Moffett, his father's consulting partner. He continued working for that consulting firm and Electronic Research Inc. all through high school and college. Tom also accompanied his father during those years and afterwards, to the annual IEEE Broadcast Symposium held each Fall in Washington, DC.

While attending Bullis High School, in Washington DC, known for its rigorous, high academic standards, Tom found that the demanding courses in mathematics came easily to him. He also enjoyed athletics, and as Tom said "to keep busy" he joined the varsity football team and became a defensive line backer and offensive wing back. He was elected to be team captain by his team mates. In addition, Tom became captain of the lacrosse team and participated on the swim team. Upon graduation from high school, Tom had earned three varsity letters in sports while also receiving an award for the best student in mathematics and physics.

Tom earned his Bachelor of Electrical Engineering from Cornell University in 1969. He continued to be active in college sports even though his academic advisor advised him against it telling Tom that the engineering curriculum courses would take up all his time – there would be no free time for other activities if he wanted to successfully complete his courses. Much to the surprise of his academic advisor, Tom completed his engineer courses while playing on the Cornell lacrosse team, which had an exceptional record of 35 wins and one loss during his three years on the team.

After Tom graduated from college, he took Jack Moffett's advice and went to work at ERI starting on January 30, 1970. Tom worked with the iron workers and linemen in Texas constructing antenna towers. That's when he became an expert rigger and lineman,

2008 NAB Award Citation to Tom Silliman

National Association of Broadcasters Radio Engineering Achievement Award

Presented to
Thomas B. Silliman, P.E.

In Recognition of His Distinguished Professional Career

For Significant Contributions to the Advancement of FM Antenna and Filter Technology

For Inspired Leadership in Broadcast Engineering
And for Constantly Encouraging and Fostering the Professional Growth of His Fellow Engineers

And for Over 40 Years of Commitment to the Highest Standards of Innovation, Research and Design for Radio Engineering

NAB Broadcast Engineering Conference
16 April 2008 * Las Vegas, Nevada

David K. Rehr, President and CEO of the National Association of Broadcasters (left), Tom Silliman holding award (center) and Lynn Claudy, NAB Senior Vice President, Science & Technology.

which he still enjoys doing today. Tom earned his Master of Engineering (Electrical) from Cornell University in 1970.

Tom advanced through ERI starting as a Project Engineer, and then with increasing responsibility as Director of Research, Vice President of Engineering, and Vice President of Operations. While at ERI in 1975, Tom designed and patented the circularly polarized Rototiller FM antenna which is widely used throughout the broadcast industry today. Tom currently serves as President and CEO of ERI. He maintains close interaction with his 250 employees by being involved with all aspects of the business, including product design, manufacturing, test and installation. He is a Registered Professional Engineer (P.E.) in the states of Indiana, Minnesota and Maryland. His company has on its staff three electrical P.E.'s, three mechanical P.E.'s and one civil P.E.

Tom is a member and past President of the Association of Federal Communications Consulting Engineers (AFCCE). He is a Senior Member of the IEEE and currently serves as Secretary on the IEEE Broadcast Technology Society Advisory Committee (AdCom).

In his professional work, Tom always goes at top speed and is known throughout the broadcast industry as a renaissance engineer with many interests and avocations. Tom's personal interest in sports continued with snow skiing. After which, he went on to become a world class white water kayaker who has travelled the rapids in the Grand Canyon, rivers in Chile, Equador, Costa Rica and all major waters in the US, especially those in West Virginia. Currently Tom is pursuing his interest on becoming a rancher. He and Ernie Jones have a 238 acre ranch with 54 head of cattle and five quarter horses. Tom is pursing this initiative with Ernie Jones, ERI VP of Structural Engineering, his friend, ranching partner and kayaking partner, to master a new set of ranching and horseback skills caring, feeding, raising, herding and roping cattle.

When asked what advice he would like to give to today's young engineers, Tom said "If you want to be a great engineer and not just an engineer, get an MBA after you earn your engineering degree. When you know engineering and business – then you can become very successful in your career. Today's engineering curriculum does not include courses on how to run a business." Tom never formally earned his MBA, but he learned his skills in business from the college of hard knocks when he started taking over management of ERI. He was fortunate to have an outstanding company bookkeeper who patiently spent an hour each day teaching Tom the principles and details of the company's accounting procedures and financial operations.

Tom also has this advice for today's engineers "Do not to be afraid to get your hands dirty after studying theory and earning your engineering degree. Be curious and work with the technicians to take devices and equipment apart and learn out how they actually work – be practical!"

While Tom recommends engineering graduates go on to earn an MBA in order to advance their professional

careers, they may also consider setting a personal goal to earn a P.E. license. This requires completing additional studies, gaining work experience in industry and passing a rigorous P.E. examination.

Tom said "I am having a very blessed and full life". Tom, now 63, is still using his lineman's skills putting up towers and antennas. He has been featured up in the *Wall Street Journal, 20/20 and Ripley's Believe it or Not* for his skills in climbing the Empire State building's TV tower and working on antennas or replacing the aircraft warning lights there.

The IEEE Broadcast Technology Society is proud to have Tom as a member, leader, friend and colleague. Tom brings great credit to the AFCCE, the IEEE Broadcast Technology Society, the IEEE and the engineering profession.

Note: For a listing of all previous winners of the NAB Engineering Achievement award, please go to: http://www.nab.org/AM/TemplateRedirect.cfm?template=/CM/ContentDisplay.cfm&section=Technical&ContentID=11028

Tony Uyttendaele Awarded 2008 NAB Engineering Award for TV

Antoon (Tony) Uyttendaele, a former IEEE BTS member, was presented with the 2008 NAB Engineering Achievement Award for TV during the NAB2008 Technology Luncheon on 16 April 2008 in Las Vegas.

Tony Uyttendaele spent 25 years of his career with ABC and retired in 2000, as Senior Advisor, Science & Technology. He continues to consult for ABC on a part time basis.

During his tenure at ABC, Tony Uyttendaele played a pivotal role in the evolution of high definition television by working with major broadcast and consumer equipment manufacturers to create 720p hardware, a video format used in the production and transmission process of HDTV. His efforts contributed to the final adoption of 720p by the International Telecommunications Union (ITU). He also developed and managed the completion of ABC's C-Band satellite network distribution system and for a number of years served as international chairman of the ITU-Radiocommunication Sector Working Party on Satellite News Gathering, which developed numerous recommendations on uniform standards and operating procedures to make SNG practical worldwide.

The IEEE Broadcast Technology extends its congratulations to both Tony Uyttendaele and Tom Silliman for receiving the prestigious 2008 NAB Engineering Awards for TV and Radio.

ATSC Recognizes IEEE BTS for 25 Years Service as Participating Member

Paving the way for next-generation digital television (DTV) standards, the Advanced Television Systems Committee, Inc. celebrated its 25th Anniversary at the 2008 ATSC Annual Meeting on 7 - 8 May 2008 at the Ritz-Carlton Hotel, Arlington, Virginia.

President Bill Hayes, on behalf of the BTS, accepted the ATSC plaque recognizing 25 years of BTS participating Membership. The ATSC award was presented on 8 May 2008 to Bill Hayes by Glenn Reitmeier, Vice President of Technology, NBC Universal and Chairman of the ATSC Board of Directors.

The ATSC plaque states:

"The Advanced Television Systems Committee proudly recognizes IEEE Broadcast Technology Society as an outstanding 25-year member of the ATSC - 1983-2008"

Glenn Reitmeier, Vice President of Technology, NBC Universal and Chairman of the ATSC Board of Directors (left) presents ATSC plaque to Bill Hayes, President of IEEE BTS.

The Advanced Television Systems Committee is an international, non-profit organization developing voluntary standards for digital television. The ATSC member organizations represent the broadcast, broadcast equipment, motion picture, consumer electronics, and computer, cable, satellite and semiconductor industries.

BTS is one of 16 organizations that are original founding and participating members in the ATSC for 25 years. They are ABC, CBS, CEA, IEEE BTS, MSTV, NAB, NBC, NCTA, Panasonic, Philips, Sarnoff, SMPTE, Sony, Tektronix, Thomson and Zenith.

The ATSC 25th Anniversary was attended by approximately 200 people including Yiyan Wu, BTS representative to the ATSC, Guy Bouchard, Chair of the 2008 Broadcast Symposium and BTS representatives Brett Jenkins, Jim Kutzner, and Charlie Einolf.

For information about the ATSC and the 25th Annual Meeting, please visit www.atsc.org.

Your Society Needs You!

Tom Gurley
Chair, BTS Nominations & Appointments Committee

The IEEE Broadcast Technology Society is seeking nominees for the Administrative Committee (AdCom) election this Fall. Any BTS member in good standing is eligible to stand for election to the AdCom. Elected officers will begin their three-year term on 1 January 2009.

The AdCom is the governing body of the Society, which administers all of the Society's affairs. There are 15 at-large members, elected by ballot of the full BTS membership. Five of the seats are open to election each year. The AdCom meets at least two, but no more than four, times a year. Members are expected to attend at least one out of four consecutive meetings to remain in good standing.

If you are interested in contributing to the governance of our Society, please nominate yourself, or nominate someone else whom you feel will help us to progress and to serve our members better. We especially encourage our younger members, in the early stages of their careers, and those working in new media technologies to become more involved in the Society. If you are an IEEE GOLD (Graduates of the Last Decade) member, please consider participating in the AdCom to help ensure that we remain relevant to your needs.

To submit a nomination for yourself or on behalf of someone else, or to get more information, please contact me by e-mail at tgurley@ieee.org. All nominations should be accompanied by a brief biographical sketch that includes current and past responsibilities; memberships and offices held; education, certifications, and other credentials; and publications, patents, and other achievements we should consider. Nominees must confirm their willingness to stand for election. We must receive your nominations by 1 September 2008.

IEEE BROADCAST TECHNOLOGY SOCIETY AdCom

Newly Elected Members-at Large For a Three-Year Term Ending 31 December 2010

DAVE BANCROFT
Manager, Advanced Technology, Thomson Systems
Reading, United Kingdom

Responsibilities: Manager, Advanced Technology, for the three Strategic Business Units of Thomson: Systems (Grass Valley), Services (Technicolor), and Technology (Corporate Research), and is based in Reading, United Kingdom. His current projects within the Thomson Group include: digital cinematography; scanning, interfacing and workflow for digital intermediate film production; color management in displays for quality assessment; and HDTV broadcasting. He works with the Thomson product, service and research groups associated with these applications and represents their interests in their standardization issues. His prior background includes the BBC, RCA, Ampex and BTS/Philips, with sales, marketing and engineering assignments in the UK, Greece, Middle East, Africa, New Jersey, California and Germany.

Membership /Offices held: He is a Fellow and a governor of SMPTE, a Fellow of the Royal Television Society, a Fellow and director of the BKSTS, a Member of the IET, and a member of the Administrative Committee of the IEEE Broadcast Technology Society.

Publications/Patents/Other: In his SMPTE standardization activities he chairs the SMPTE Study Group on Display Technologies and the Ad Hoc Group on DPX File Format Revision.

CHRISTINE M. DI LAPI
Senior Staff Engineer, Spectrum and Regulatory Affairs, Motorola Inc.
Washington, DC USA

Responsibilities: Has worked for Motorola Inc. since 1990, and has been with the Global Government Relations organization in Washington DC since 1998. Primary area of responsibility has been involvement in the international spectrum and regulatory issues that impact Motorola, principally those in the International

Telecommunication Union (ITU) Forum. Current participation includes the working parties (WPs) of both SG 6 (Broadcasting Services) and SG 8 (Mobile Services), especially those WPs involved in broadcasting in a mobile environment and mobile broadband wireless areas. Main technical focus has been the advocacy of regulatory concepts that promote the deployment of new and advanced wireless telecommunication and consumer applications.

Memberships/Offices Held: IEEE member since 1984. Member of IEEE Communications Society, and IEEE Broadcast Technology Society.

Education: BSEE from Clemson University, and MSE from the University of Texas at Austin.

Publications/Patents/Others: 2006 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting. USTTI, May 2006, session on mobile multimedia broadcasting technologies. Joint contribution to the development of several ITU-R deliverables on both spectrum management and technology issues.

RALPH R. HOGAN, JR.
Assistant General Manager, Engineering Services
Washington State University, WA, USA

Responsibilities: Since 1998, Assistant General Manager, Engineering Services, Washington State University (WSU). Principal engineering senior manager of an organization with more than 40 sites in Washington, Idaho and Oregon, including 4 television and 13 radio transmitters, 37 interactive video classrooms, studios, translators, a statewide digital interconnection, and a multi-channel digital satellite teleport. One of four principal engineering investigators for the CPB's Advanced Digital Distribution Entity (ADDE) project. Previous responsibilities include: Dir. of Engineering and Operations, BSU Radio Network and Tenured Instructor, Broadcast Technology program, Boise State University, 1990 to 1998, Chief Communications Engineer, KSLU FM, Southeastern Louisiana University, Hammond, LA, 1984 to 1990, V.P. Engineering, First National Video, Inc., New Orleans, LA, 1984 to 1986, Video Consultant (1981) to C. E. (1983 to1984), Pan American Film and Video, New Orleans.

Memberships/Offices Held: Senior Member, Member since 1969. Member, IEEE Consumer Electronics Society and IEEE Broadcast Technology Societies. Vice-Chair, Officer and member of ExCom of IEEE Palouse Subsection. Senior Member since 1991, former national board member, former Chapter Chair, and currently Member of National Certification Committee of Society of Broadcast Engineers (SBE). SBE voting representative to the ATSC since 2005. Member of Northwest Public Radio Steering Committee, Member, Public Radio Engineering Advisory Committee (PREAC) since 2004, Member At Large representative to the PBS Enterprise Technical Advisory Committee (ETAC) since 2002, Broadcast Education Association, Alpha Epsilon Rho, Chair of WSU departmental Emergency Response Planning Committee, Member of WSU University Advisory Committee on Computing and Telecommunications (UACCT).

Education: B.S. Engineering Science, Louisiana State University, 1971; SBE Certifications for Professional Broadcast Engineer and Broadcast Networking Technologist; FCC General Class w/Radar Endorsement.

Publications/Patents/Other: Numerous presentations include: "Virtual Master Control Implementation at Northwest Public Radio (NWPR)" a presentation at the Public Radio Engineering Conference 2006, and "BSU Radio Network A Case Study in Facility Design", Public Radio Conference, 1995.

BRETT JENKINS
Director of Technology Strategy and Development, ION Media Networks, Inc.
New York, NY and West Palm Beach, FL, USA

Responsibilities: Director of Technology Strategy and Development for ION Median Networks, supports development and evaluation of advanced television technology business models, and oversees the strategic and logistical direction and implementation of digital television and mobile programs. Prior to joining ION in the fall of 2007, Mr. Jenkins, as VP of Engineering for Thales Broadcast & Multimedia, Inc., was most recently the TV Transmission U.S. Product Manager, and was previously responsible for modulator and exciter technology and development for broadcast products.

Memberships/Offices Held: Member of the Institute of Electrical and Electronics Engineers (IEEE) and the Society of Motion Picture and Television Engineers (SMPTE).

Education: BSEE with honors from the University of Massachusetts, 1992; MBA from Boston University, 2005.

Publications/Patents/Other: Lead US engineer in a global team developing Digital Adaptive Pre-correction technology for which Thales received a technical and engineering excellence Emmy award in 2003; holds several patents. He is active in many broadcast industry groups involving Digital Television. He has authored and presented technical papers and tutorials on various digital communications topics, including the chapter on digital television transmitters for the 10th Edition of the NAB handbook.

JINYUN ZHANG
Manager, Digital Communications and Networking, Mitsubishi Electric Research Laboratories
Cambridge, MA, USA

Responsibilities: Manager of Digital Communications & Networking group at Mitsubishi Electric Research Laboratories (MERL), since 2001. Currently, she is leading many new broadband wireless communications and networking research projects that include UWB, broadband multimedia home networking, ZigBee Ad Hoc and wireless sensor networking, MIMO, high speed WLAN, WiMAX and next generation mobile communications. Prior to joining MERL, worked for Nortel Networks for more than 10 years, where she held various management positions and engineering positions in the areas of digital signal processing, advanced wireless technology development and optical networks. She was a key contributor for Nortel's 1st generation, 2nd generation and 3rd generation mobile base stations and ultra high speed optical DWDM networks.

Membership /Offices held: IEEE Fellow, Associate Editor of IEEE Transactions on Broadcasting. Has served as a TPC member of several IEEE conferences and a technical reviewer for various IEEE publications.

Education: Ph.D. in Electrical Engineering from the University of Ottawa in 1991.

Publications/Patents/Other: Has authored and co-authored more than 80 publications, invented and co-invented more than 50 patent applications, and made numerous contributions to various international standards in the area of wireless communications.

Argentina IEEE BTS Chapter Hosts Three Day Seminar on Antennas

by Valentino Trainotti, Chair

The BTS Argentina Chapter and the Student Branch of the University Technological National, Regional School Buenos Aires attended a three day seminar presented by Valentino Trainotti. The seminar was held in the IEEE Argentina Section Headquarters in Buenos Aires on 11-13 March 2008.

The seminar provided:

-- A brief history of antennas
-- Antenna parameters
-- Basic radiators
-- Types of antennas
-- Measurements

Valentino Trainotti is Associate Professor for Radiation Systems and Propagation and also is Secretariat for Research and Doctoral Programs with the Faculty of Engineering at the University of Buenos Aires. He also serves as Chair of the Argentina BTS Chapter.

Valentino Trainotti presenting Antenna Seminar

Gustavo Fano, BTS Chapter Vice Chair assisted Valentino Trainotti with preparations for the Seminar and the Seminar event.

The seminar was very successful with 40 people in attendance consisting of students, professors and broadcast engineers.

Beijing BTS Chapter Report

By Jian Song, Chair

IEEE BTS Beijing Chapter was founded in February 2007. All founding members are closely involved with digital television and multimedia research and implementation.

The Chinese Terrestrial DTV standard (with English acronym of DTMB for Digital Television Terrestrial Multimedia Broadcasting) was announced in August 2006 and members of BTS Beijing Chapter have made significant contributions to the research and standard development.

When the International Conference on Communications (ICC2008) 19-23 May 2008, Beijing announced its call for proposals for workshops, BTS Beijing Chapter (chaired by Dr. Jian Song, a professor at Tsinghua University) responded quickly and submitted a workshop proposal titled "Digital Television and Mobile Multimedia Broadcasting". There were 15 workshop proposals submitted to the ICC2008 Workshop Committee, The BTS Beijing Chapter proposal and seven proposals were accepted. The workshop was held on 23 May 2008. After careful selection by the Workshop TPC, there were eight speakers who gave presentations on video compression, physical layer transmission, and applications associated with broadcasting and multimedia technology. The authors come from Asia, Europe and North America. Two invited speakers highlight the technical trend and joint (EU-China) research & development project in this area.

Members of BTS Beijing Chapter have been actively involved in the preparation of this workshop. Their diligent efforts include proposal drafting, TPC setup, paper reviewing, acceptance notification, program drafting, and other logistics planning. Dr. Yiyan Wu has provided great help to our Chapter on how to organize the topics. He served as co-chair this workshop with Dr. Jian Song. He also presented a seminar during this trip in Beijing to BTS members.

We would like to thank all the suggestions and help received from BTS members regarding this workshop and especially the following who have made significant contributions to the workshop:

Workshop Technical Program Committee (TPC):

Gene Cheung	Hewlett Packard Laboratories, Tokyo, Japan
Gabriel Muntean	Dublin City University, Dublin, Ireland
Jong-Soo Seo	Yonsei University, Seoul, Korea
Jian Song	Tsinghua University, Beijing, China
Jintao Wang	Tsinghua University, Beijing, China
Jun Wang	Tsinghua University, Beijing, China
Zhaocheng Wang	Sony Laboratories, Stuttgart, Germany
Hong Ren Wu	Royal Melbourne Institute of Technology, Melbourne, Australia
Yiyan Wu	Communications Research Centre, Ottawa, Canada

2007 Activity Report of IEEE Russia Northwest Broadcast Technology, Consumer Electronics and Communications Societies Joint Chapter (IEEE Russia Northwest Section)

By Dmitry Tkachenko, Chair

1. The Chapter participated in the 9th International Conference CSTB 2007 in the framework of the exhibition CSTB 2007 (Moscow, Exhibition Center "Crocus Expo", 5-7 February 2007). The conference was organized by MIDEXPO company in association with International Broadcasting Convention (IBC), International Association of Broadcasting Manufacturers (IABM), Ministry of the Russian Federation for Culture and Mass Communications, Telesputnik Publishing House and 625 Publishing House. 88 papers were delivered at the conference.
2. The Chapter took part in organizing the conference "Technical Basis for Next Generation Info-Communications Services" in the framework of 14th International Communications Exhibition NORWECOM 2007 (St.Petersburg, Exhibition Center "Lenexpo", 14 – 15 February 2007). 19 papers were presented at the conference.
3. Chapter Chair Dmitry Tkachenko took part in the IEEE Broadcast Technology Society Administrative Committee meeting in Las-Vegas on 17 April 2007.
4. Members of the Chapter actively participated in the annual meeting of IEEE Russia Northwest Section that was held in St.Petersburg Electrotechnical University on 21 May 2007.
5. The Chapter organized seminar "New Trends in Communications" on 21 May 2007 where IEEE Communications Society (ComSoc) President Nim K. Cheung made

presentation "Towards the Era of Ubiquitous Networks" and ComSoc Director of Standards Alexander D. Gelman made presentations "Disruptive Technologies as an opportunity for Consumer Communications and Networking" and "Highlights of ComSoc Technical Activities – Supporting Competitive Research".

6. ComSoc President Nim K. Cheung hosted a dinner for active Chapter members on the evening of 21 May 2007.
7. Chapter Chair Dmitry Tkachenko took part in the IEEE Broadcast Technology Society Administrative Committee meeting in Amsterdam on 6 September 2007.
8. The Chapter took part in organizing the 7th International Conference on Next Generation Teletraffic and Wired/Wireless Advanced Networking NEW2AN 2007 (St.Petersburg, 10 – 14 September 2007). The conference was organized by Tampere University of Technology (Finland) and BalticIT (Russia) in cooperation with ITC (International Teletraffic Congress), Popov Society, COST 290 and support of NOKIA. 39 papers were delivered at the conference.
9. A Joint Seminar, presented to the Chapter and the IEEE Russia Northwest Chapter of Engineering Management and Computer Societies, took place at the premises of Motorola St. Petersburg Software Center on 31 October 2007. Three technical presentations were presented at the seminar.
10. Members of the Chapter took an active part in the International Telecommunications Symposium on Mobile Communications (St.Petersburg, 4 – 5 December 2007). 23 papers were presented at the Symposium.

Ottawa Joint ComSoc and BTS Chapter

By Wahab Almuhtadi

The IEEE Ottawa Joint Chapter of Communications Society and Broadcast Technology Society (ComSoc/BTS) organized the following technical seminars:

1. Blind Modulation Classification: A Concept Whose Time Has Come by Dr. Octavia A. Dobre, Faculty of Engineering and Applied Science, Memorial University of Newfoundland, St. John's , NL, Canada on Wednesday 26 March, 2008.
2. Advances in Wireless Sensor Networks by Dr. Hussein T. Mouftah, Canada Research Chair and Distinguished University Professor SITE, University of Ottawa, Ottawa, Ontario, Canada on Wednesday February 27, 2008.

For more information about both of these seminars, please visit: http://ottawa.ieee.ca/comsoc/pastevents.html

New York BTS Chapter

By Warner Johnston, Chair

As we have in the prior two years, the BTS-New York Chapter participated in the Lower Hudson Valley Engineering Expo. This is an opportunity for middle and high school students to talk with any number of engineers from various fields, companies working in engineering, governmental agencies and their engineering needs and colleges/universities offering engineering. This year about 90 different entities were present ranging from IEEE through Wyeth drug company. About 525 students from the Lower Hudson Valley were present. This occurred on 30 March 2008.

On 2 April BTS and WIE held a joint meeting with 17 present, where a tutorial on NTSC Closed Captioning was offered for 0.1 CEUs. Seven people attending requested the CEU credit. The tutorial was presented at the NY Transit Authority Headquarters.

The tutorial was given by Warner W. Johnston SM IEEE, who is chair of CEA R4.3 WG1 and WG 8. CEA is the ANSI accredited body charged with documentation of Closed Captioning, for which its members received an Emmy (tm). WG1 and WG8 are the Working Groups within sub-committee R4.3 that deal with ATSC captions in the Standard CEA-708-C and NTSC captions in the Standard CEA-608-E.

The 2nd tutorial in this series, on ATSC improvements in Closed Captioning was held on 14 May, again at NYTA HQ. And again 0.1 CEU will be offered to those paying the $15 fee and filling out the evaluation.

Waldemar Poch and the Origins of Vestigial Side Band Modulation

by James E. O'Neal

As with many long-established conventions and rules, it's easy to just accept and not question anything that works well. In television, one of these is defined in that part of the FCC regulations that states:

Subpart E--Television Broadcast Stations
Sec. 73.682 TV transmission standards.
(a) Transmission standards.
(1) The width of the television broadcast channel shall be 6 MHz.
(2) The visual carrier frequency shall be nominally 1.25 MHz above the lower boundary of the channel.

The placement of the visual carrier 1.25 MHz above the channel's "lower boundary" defines a form of modulation not considered before the advent of broadcast television. This is termed vestigial side band (VSB) and has been a part of U.S. television, even before that medium became a commercial reality in 1941.

Although 2009 is supposed to be the death knell of analog broadcasting, VSB will not be departing the landscape. It will live on in its original implementation in low power, Class A and translator television transmissions, as no digital conversion mandate exists for these services. Even after all U.S. television transmissions become digital, a variant of the original vestigial side band modulation will remain—8-VSB.

With VSB's being "joined at the hip" to television, it's interesting to examine its origin and the careers of some of those responsible for it, especially that of one Waldemar (Wally) J. Poch, a pioneer in early television whose accomplishments are little remembered.

SOVIET MYSTERY

I first became aware of Poch's legacy on a cold January morning in a drafty and cavernous Moscow science museum. In one of the galleries there I spotted a 1930s vintage "mirror-lid" television receiver, which on first glance appeared to have been reverse engineered from an American or British design. However, on closer inspection, the set—with all functions marked in Cyrillic—bore the standard RCA "meatball" logo.

This artifact presented a real mystery, as I was raised during the Cold War and any sort of technology exchange with the enemy was unheard of. Yet, here was evidence that at one time RCA had supplied television equipment to the Soviet Union. After some research, I learned that the Radio Corporation of America, without fanfare and with extremely little much public notice, had indeed supplied the Soviets with their first electronic television system. An equipment order, sufficient to construct television studios and transmission facilities in three cities, was dispatched from RCA's Camden broadcast equipment operation in 1937. Accompanying the gear was a specially chosen team of engineers to assist in installing the gear and training Soviet men and women in its operation.

Poch was one of those engineers..

POCH'S ENTRY INTO TELEVISION

Poch was born in England in 1905, and later immigrated to America. He took a degree in electrical engineering at the University of Michigan in 1928 and began his career with General Electric. After two years in Schenectady, Poch made a career move to the Radio Corporation of America and initially worked in radio receiver design. Another move within RCA put him

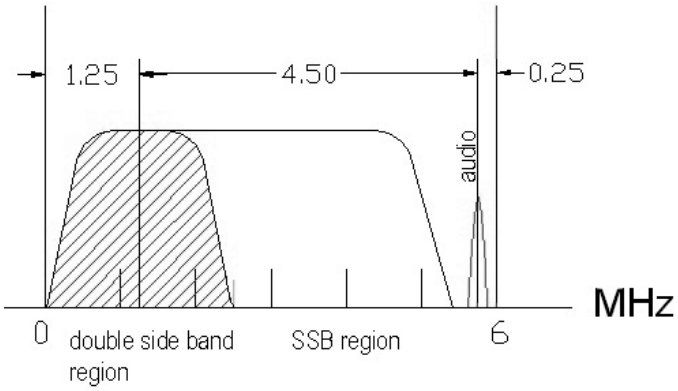


Fig. 1. FCC television channel utilization

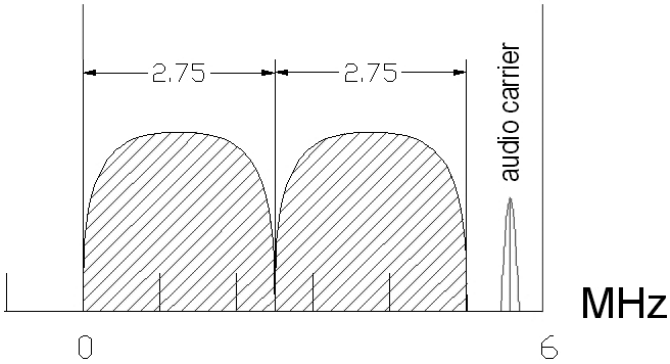


Fig. 2. Double side band modulation of a 6 MHz television channel

squarely on the ground floor of a new industry, as he became part of the company's Research Group on Television Receivers. Poch remained there until 1936, and during this time helped to develop the basic workings of some of the first electronic television receivers—synchronizing circuitry, video amplifiers, detectors, and other circuit elements. He spent his hours outside RCA pursuing an advanced degree at the University of Pennsylvania, and was awarded a masters degree in electrical engineering in 1934.

BANDWIDTH ISSUES

In the late 1920s and early 1930s, experimental television transmissions were relegated to radio frequency spectrum in or near to the AM broadcast band. These early television images were generated by mechanical scanners, and as resolutions were limited to around 100 lines or less, such frequency allocations were generally satisfactory in terms of bandwidth.

However, with the development of electronic imaging and display devices, greater resolution was possible and this necessitated more transmission bandwidth than was possible in a portion of the spectrum where 10 kHz allocations were the norm.

A poll of sorts was taken among those working in television's development to determine what might be appropriate in terms of spectrum bandwidth. The consensus was that six MHz (then megacycles) would probably be more than adequate for a transmission channel. Armed with this information, an industry group, the Radio Manufacturers Association (RMA), now the Electronic Industries Alliance (EIA), approached the Federal Communications Commission in the mid-1930s with a request for special spectrum allocation for television broadcasting.

The Commission agreed to this proposal, and assigned seven six-MHz-wide blocks or channels in what was then sort of a spectrum wasteland—the "ultra high frequency" region (what we now term VHF).

That RMA request and subsequent FCC grant became the basis of the six MHz channelization that exists today.

As sometimes happens in any new science, unexpected developments can take place very quickly. And while channels 6,000 times greater than those allocated for radio broadcasting initially seemed like a vast amount of bandwidth, with the rapid strides being made in television imaging devices, some soon began to question whether this would really be sufficient after all.

On-air transmission of television images evolved directly from AM audio broadcasting—the output of a mechanical scanner was fed to an audio transmitter, producing a conventional double side band AM signal. It worked fine for radio broadcasting and was viewed as the proper way for transmitting video. As imaging resolution increased (and more spectrum was allocated) it was just a matter of scaling things (transmitter bandpass) up for the higher frequencies being generated.

In examining the double sideband approach to transmitting television signals, it is readily apparent that an upper frequency limit of three MHz is all that can be accommodated within a six MHz channel. In practice, this is further reduced in order to create guardbands and to accommodate an audio carrier. (See Fig. 2).

LOCKED IN TO A 2.5 MHZ TRANSMISSION CHANNEL

With these necessary reductions, an upper video response limit of perhaps 2.5 MHz is about the best that can be hoped for.

When the early electronic television players decided that 6 MHz channels would be satisfactory, this 2.5 MHz bandpass was not really viewed as a limiting factor in the development of the new medium. RCA began the first experimental VHF transmissions from the Empire State Building in 1931, and cathode ray tube receivers were available, but a suitable electronic imaging device (camera tube) had yet to be perfected. The signal source used for those test transmissions was a 120-line a mechanical scanner. In a few years, camera pickup tube technology had developed to the point where it was easily possible to generate images well in excess of what could be accommodated within the 6 MHz channels. While the RMA request to the FCC called for 441 lines, given the state of the art then, this seems overly optimistic for a 2.5 MHz transmission channel. For a time in the mid-1930s, 343 lines was accepted as a de facto standard. (This was the resolution of the system sold to the Soviet Union by RCA.)

Was there an easy solution?

Going back to the Commission to admit that there had been an error in judgment in the initial request for six mHz-wide television channels and to request a reworking of television spectrum allocation would probably have been received no better then than a plea today to rethink the approaching 2009 DTV transition. So, short of the development of some serious video compression technology, it appeared that television with a resolution in the neighborhood of 400 lines would become the definitive U.S. standard.

Enter Waldemar Poch.

In his work with television receiver circuitry, Poch observed that a better picture could sometimes be obtained by purposefully tuning away from center carrier—in effect placing the picture carrier near the edge of the receiver passband.

This observation led to experimentation and mathematical modeling by Poch and David Epstein, another RCA engineer, during 1935 and 1936. The two proved to their satisfaction that television signals, unlike conventional commercial radio broadcasts, did not need to be transmitted with both side bands intact.

(At least 20 years earlier it had been recognized that, in theory, only a single side band needs to be trans-

Waldemar Poch

David Epstein

George Brown

mitted to convey intelligence . Either the upper or the lower side band could be docked, along with the carrier, and the message (audio) still could be demodulated. This marked the beginning of single side band (SSB) transmission which later became widely used in radio communications and carrier telephony. However, if care is not taken in reinsertion of a carrier signal in the demodulation process, distortion of low frequencies can occur. This is not really a factor in the transmission of speech, as the range of frequencies involved is rather narrow. Satisfactory television transmission, on the other hand, depends upon frequencies approaching DC to properly convey brightness information in larger objects. This requirement for distortion free transmission of lower frequencies is exacerbated by the low frequency synchronizing information transmitted in a composite video signal. Further, a detector for SSB is more expensive to construct and difficult to adjust than the diode or envelope detector used to demodulate double side band AM. These factors precluded the use of SSB transmission for television broadcasting)

Poch and Epstein decided that a compromise was in order. They would retain the carrier and attenuate most, but not all, of the lower side band. This would allow detection with a simple diode, and obviate the requirement for precise carrier reinsertion. In essence, frequencies below a certain point would be transmitted as a conventional double side band (with carrier) signal, while those above this point would take the form of a single side band signal. Proper circuit design and alignment would make up for the reduced amplitude in the higher frequency, or single side band, region.

The name proposed by Poch and Epstein for their modulation scheme was "selective side-band transmission."

In addition to their mathematical analysis of the new modulation format, the two constructed a laboratory model of such a system to prove that it worked in practice.

Poch and Epstein wrapped up their experimentation near the end of 1936 and prepared a paper on their findings for delivery at the IRE's fall meeting in Rochester, N.Y. in November of that year. It was entitled "Partial Suppression of One Side Band in Television Reception," and was deemed significantly important as to be simultaneously published in the January 1937 editions of both The Proceedings of the Institute of Radio Engineers and The RCA Review.

As stated by Poch and Epstein in their paper, "An immediate advantage is that we nearly double the modulation frequency range."

This is echoed later with the statement that, "Changing from double side-band to selective side-band operation, therefore, means an approximately two-to-one improvement in detail which results in a distinctly clearer and sharper picture."

Their ideas set the stage for all future television broadcasting.

The two were aware, however, that there could be a problem in implementing their suppressed or selective side band transmission system. Their laboratory testing and verification had basically been accomplished by altering the receiver's passband. Filtering at the transmitter was not attempted in this first round of work, and while pointing out that if one side band could be suppressed at the transmitter there would be a considerable saving in channel requirements, however, they were also careful to note that this could come at a price.

"The suppression of one side band at the transmitter becomes a very difficult problem at the frequencies which are used for television. If this can be successfully done then the band width of one channel for television can be considerably reduced."

Poch, in addition to being a first-rate engineer and theoretician, had a reputation for being a "hands-on" person. (His daughter recalled that during her teen years when she asked for a

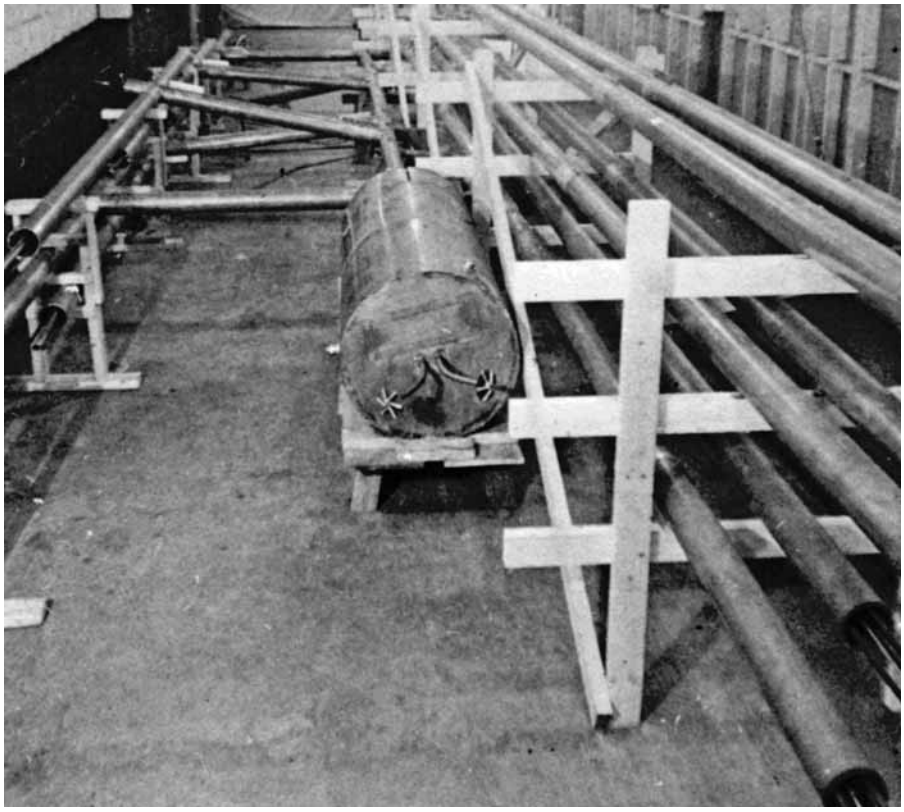


Fig. 3. The first vestigial (or selective) side band filter was constructed in 1938 and measured some 40-feet x 10-feet.

portable radio, her father purchased a Heathkit model and instructed her in its assembly.)

A logical next step would have been for Poch (and possibly Epstein) to tackle the technical challenges involved in the actual design and construction of such a filter.

Fate intervened at this point and derailed such an undertaking.

As previously mentioned, RCA had received a large contract in 1935 to supply the Soviet Union with its first electronic television system. Poch was one of six RCA engineers chosen by project manager Loren Jones to prepare and accompany the 180 tons of television gear purchased for installation in the Soviet cities of Moscow, Leningrad and Voronezh. This engineering detachment left Camden in mid-1937 and would remain in the Soviet Union for nearly a year.

(Epstein was not tapped for the Moscow technology transfer and was soon working on television display devices, where he would spend the balance of his career with RCA.)

It would be logical to assume that Poch, upon returning from the Soviet Union, would pick up where his work with Epstein left off in late 1936. However, this too did not happen.

Enter George H. Brown.

Brown was hired by RCA's broadcasting division in late 1933 and became heavily involved in radio antenna work, especially the engineering of AM directional arrays which were just coming into their own at this time.

However, as the result of a salary dispute, Brown left RCA in the spring of 1937 and worked as a consulting engineer for some months before being rehired at a more satisfactory compensation rate. His second stint with the company in began in January 1938.

Shortly after being rehired Brown took an interest in RCA's television program. As recorded in his autobiography:

"On my return to RCA from my consulting escapade, I asked Elmer Engstrom (then supervisor of RCA's television program) to recommend some reading of technical literature which might give me an understanding of the rudiments of television systems. He was very helpful and as a result I read a number of recently published papers, one of which was authored by Waldemar Poch and David Epstein, both in the RCA Research Department."

Brown quickly seized upon the television image improvement possibilities suggested by Poch and Epstein, and just as quickly initiated a program to design and construct the transmitter side band filter they had envisioned in their paper. Brown relates:

"In the middle of January, I told Elmer Engstrom of my plans and he urged me to proceed, I received no encouragement from other television pundits except Wally Poch and David Epstein."

(With the passage of more than 70 years, it is difficult to ascertain Brown's motives in suddenly becoming interested in television—something that he had ignored almost completely during his earlier employment with RCA—or why he decided to move out so rapidly to put into practice the ideas set forth by Poch and Epstein. Brown's autobiography provides no real clues. However, it must be remembered that when Brown undertook this filter development project, Poch was some 4,700 miles away in Moscow with very limited access to communications. So despite Brown's statement, it seems highly improbable that he communicated with Poch about developing a filter or anything else. Brown also undertook this project without involving Epstein, who had remained in Camden. It is interesting to note too that Brown quickly discarded Poch and Epstein's "selective" or "suppressed" side band terminology in favor of his own contrivance, "vestigial" side band transmission.)

Brown put the project on a fast track, completing shop drawings for his "vestigial side band filter" by the end of his first month back with the company, and had a working unit constructed before the end of the following month. Brown relates that the test results were "flawless" and quotes Engstrom, who witnessed the test, as stating, "Another milestone in television has been passed."

Before 1938 ended, Brown had had the filter, which was constructed from 4-1/2-inch diameter copper tubing and measured some 40-feet in length and 10-feet wide, disassembled and transported to the Empire State Building. It was reassembled there for connection to the experimental television transmitter being used for NBC broadcasts.

Brown's filter was first placed into service in October 1938, making the NBC transmitter the first in the world equipped for vestigial side band broadcasting. A new "turnstile" type transmitting antenna was installed on the Empire State Building in early 1939, and this antenna/filter combination was in place when NBC initiated its first regular scheduled television service with a broadcast marking the opening of the New York World's Fair in April 1939.

Brown applied for a patent in August 1938 for his "vestigial side band" invention. This was granted on Sept. 10, 1940, with the title "Electrical Network" and assigned to RCA. In his patent description, Brown does not acknowledge the initial work by Poch and Epstein.

(The RCA 343-line transmitters previously installed in the three Soviet cities were obviously not initially equipped for VSB operation. The BBC began regular 405-line television service London in 1936 with a double side band transmitter and it is believed that such transmissions continued into the early 1950s. By the time U.S. commercial television broadcasting began in 1941 all transmitters here were equipped for VSB operation.)

POCH'S TELEVISION LEGACY

After returning from the Soviet Union, Poch remained active in television equipment design, creating transportable pickup gear used at the 1939 World's Fair. During the war years, he designed and developed airborne television apparatus, known as the "Block" equipment. This could be used for guiding unmanned "drone" aircraft to their targets and is the forerunner of the so-called "smart bomb." Following the war, Poch was responsible for the design and development of broadcast television equipment, including RCA's first commercial color film chain, the TK-25. Other accomplishments by Poch include sync generators, switchers and microwave gear.

Poch returned to Moscow in 1959, where he responsible for the installation and operation of a color television studio at a three month-long exposition of American technology. Among those receiving demonstrations of the latest innovations in U.S. color television and video recording was Soviet Premier Nikita Khrushchev. (This exhibition was the setting for the so-called "kitchen debate" between Khrushchev and then Vice President Richard Nixon.)

Poch spent 40 years with RCA, retiring in 1970. During his career, he amassed a total of 31 patents, nearly all television-related.

Poch's name is not normally associated with VSB, nor is it with another television innovation for which he was directly responsible. However, the latter is certainly well known to anyone who has worked with television monitors or receivers. He received a patent (number 2431824) for this invention on May 13, 1943. The patent is somewhat deceptively titled "Cathode Ray Tube with Revolving Magnets and Adjustable Sleeve."

Prior to Poch's invention, horizontal and vertical centering of images on electromagnetically scanned CRTs had been accomplished by inserting a DC bias voltage in series with the scanning waveforms. This required extra circuitry and variable resistors which could handle the necessary currents. Further, the image centering was only as stable as the DC voltage source.

Poch greatly simplified matters by replacing the bias voltages with a permanent magnet assembly for centering the raster. This was a very simple and almost obvious solution, but one that had been overlooked until Poch put it into practice. Magnetic centering quickly was adopted by the television industry and became an integral part of most receivers and monitors until the advent of color. To this day, magnetic centering devices continue to be employed on CRT-based monochrome television monitors.

Waldemar Poch was an IEEE Fellow and served on several IRE/IEEE television standards committees. He was also an IEEE delegate to the Popov Society Congress held in Moscow in May 1972.

Poch died of amyotrophic lateral sclerosis, or Lew Gerrig's disease, in 1984 at the age of 79.

The author wishes to acknowledge the assistance of Carolyn Wilburn, Waldemar Poch's daughter, in preparation of this article. Appreciation is also extended to Dr. Alexander Magoun at the David Sarnoff Library in Princeton, N.J.

Photographs in this article were provided courtesy of the Sarnoff Library.

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Longley-Rice and the Irregular Terrain Model

By Sid Shumate, Givens & Bell

At the 2008 NAB Spring Show, I received some feedback about this series of articles; one notable comment was that "It seemed that I was joining a conversation in the middle." My previous articles have focused on specific parts of the Longley-Rice (L-R) Irregular Terrain Model (ITM) implementation. Starting in this article, I will provide a conceptual overview of Longley-Rice not found in the NTIA documentation.

Tech Note 101 (TN101) provides a section-by-section description of the methodology that is primarily meant for general use, or manual use with maps and a slide rule. With respect to the Irregular Terrain Model, (ITM), the NTIA documentation quickly gets into the details, without providing an overview of the conceptual differences, the shortcuts, and the limitations that exist in the 1982 ITM implementation when compared with the original 1967 TN101 methodology.

The Longley-Rice propagation prediction methodology combines just three basic, core concepts with terrain data, to provide radio reception prediction that considers the terrain over which the signal is being received. These three concepts are:

1. Free space loss (dispersion).
2. At far distances and in deep valleys, a signal reflected off of the troposphere.
3. The concept of a direct signal combining with, and often being cancelled by, a reflected or diffracted signal, with many expansions and variations.

In the ITM implementation, these are utilized in three mode ranges:

1. Line-of-Sight
2. Diffraction over:
   a. A mutual rounded horizon with smooth or irregular terrain, or
   b. The two most significant obstructions, using a weighted combination of knife-edge and rounded edge computation;
3. Troposcatter

The range of consideration in the ITM diffraction mode is significantly simplified when compared to the more comprehensive Tech Note 101 methodology, which can consider:

1. Line-of-Sight
2. Diffraction over either:
   a. A mutual rounded horizon with smooth or irregular terrain,
   b. A single, knife edge obstruction
   c. Two knife edge obstructions
   d. (with a Vogler extension) multiple knife edge obstructions
   e. One or two obstructions using a weighted combination of knife-edge and rounded edge computation
3. Troposcatter

Free Space Loss (Dispersion)

The classic term "free space loss" is a misnomer; a more accurate term is "dispersion," as Newtonian conservation of energy applies. The classic textbook form of the received signal power equation:

Free Space Path Loss = 20log(d) + 20log(f) +32.44 dB

as used by the ITM, considers only the horizontal path distance, and requires the use of distance in kilometers and frequency in MHz. The log functions used here are common logarithms, i.e., base 10 functions. It is based on the concept of a signal transmitted from a 3-dimensional non-directional point source, a theoretical "isotropic" antenna. The field strength (field voltage) version of the equation:

Field Strength for 1 kW ERP: E_{fs} = 106.9 – 20log(d) dB(uV/m), d in km.

calculates the attenuation due to dispersion of the signal as it expands in a sphere shape from the point source, measured as received on a theoretical one square meter sized patch on the inside of the sphere. The wrap-around software used to interface the ITM core subroutines with today's computers will use this equation to provide field strength readout. The Free Space Path Loss (FSL) received signal formula computes the signal received by a dipole antenna located in the "patch" on the sphere; in addition, it considers the reception gain due to the frequency-varying length of the tuned dipole antenna, which results in the 20log(f) term.

When describing Free Space Dispersion in this article, since L-R uses the word "loss", so I will too. Free Space Loss is computed and added in all three mode ranges.

Troposcatter (Scatter) Loss

At a far distance, and in the bottom of valleys in the far end of the diffraction range, the strongest signal available arrives by way of a signal reflected (scattered) off of the troposphere. It the TN101 methodology, both the diffraction loss and the troposcatter loss are calculated, and the stronger signal is the one selected. In the ITM, a distance where a change-over point occurs is calculated as distance dx; before distance dx, the diffraction curve result is used; beyond the distance dx, only the troposcatter curve result is calculated and reported. The "curves" will be explained later when I discuss the averaging system.

The Combination of a Direct Signal and a Reflected or Diffracted Signal

Have you heard the instrumental pop song "Popcorn?" In the days before automation, live radio DJ's often played part of this song to fill the last minute or two before the top of the hour. Today, there is a website where you can listen to more than 75 variations on the song "Popcorn." In much the same way, Longley Rice builds in many ways on the simple core concept of a direct radio signal combining with one or more reflected (or diffracted) signals. The

mathematical equations for Two-ray Multipath, Fresnel zone interference, diffraction over earth curvature, diffraction over one or more knife edges, diffraction over one or more rounded objects, and more, as explained in TN101 and used in L-R, are all more easily understood when first considered as being variations and extensions of this basic concept. This should be kept in mind when studying TN101 which can be downloaded from the NTIA website at http://www.its.bldrdoc.gov/pub/ntia-rpt/tn101/. This core concept is one of the major strengths of the L-R methodology, but a little over-reliance on it is also the worst weakness.

I previously mentioned the three "mode ranges," Line-of-Sight, Diffraction, and Troposcatter. Here is how these three concepts combine in the three ranges, as used in the ITM:

1. The Line-of-Sight Range:
   a. Free Space Loss
   b. A weighted combination of:
      i. Two-ray calculation (Multipath)
      ii. "Terrain" diffraction
2. The Diffraction Range:
   a. Free Space Loss
   b. A weighted combination of:
      i. Knife Edge diffraction (for the two most significant obstructions)
      ii. Rounded Edge diffraction (for the two most significant obstructions)
3. The Troposcatter Range:
   a. Beyond the distance dx, an estimate of the location where troposcatter attenuation is less than diffraction attenuation, tropospheric scatter loss is used.

What are the Strengths of the TN101 Methodology? These parts work well:

b. Free Space Loss
c. Two-ray Multipath. But it fades quickly with irregular terrain.
d. Diffraction losses for horizons, or one or two obstructions, where the transmitter and receiver are far from the horizons or obstructions.
e. Encroaching obstacle diffraction.
f. Troposcatter loss calculations.

What areas of TN101 have weaknesses?

a. Knife-edge diffraction close to any obstacle.
b. Rounded earth diffraction close to any obstacle.

The obstruction diffraction computations are not valid when the grazing angle, the angle between the ground surface and a line between the transmitter or receiver, and the top of an obstruction or horizon, becomes more than 0.2 radians, about 11 degrees. This is stated in TN101. This means that L-R cannot compute losses close to an obstruction! When attempting to run a terrain profile, this is a major problem; not so much for the transmitter site, as L-R is not expected to work for a path distance of less than 1 km, but for the receiver as it approaches, passes over, and proceeds down the far side of an obstruction into the valley beyond.

c. Determination of additional losses found in the line-of-sight (LOS) range in addition to the Free Space and Multipath losses.

The two-ray calculations quickly fade out as the terrain irregularity increases. Field measurements show that there are additional losses in the LOS range in addition to the Free Space Loss and the Two-Ray Multipath Loss, when the terrain is rough.

What are the additional weaknesses of the ITM?

1. The ITM diffraction computation works for two obstructions only. It treats a mutual horizon as two obstructions; it also finds and treats the two highest obstructions visible from the transmitter and receiver as two obstructions. But when only one obstruction exists, the computation fails; the distance between the two obstructions, identified as variable ds, computes as zero; the computation then attempts to divide by ds, resulting in a not-a-number result for the diffraction attenuation in the subroutine *adiff*.

   How does the Tech-Note 101 L-R get around the failure of the computations to work near an obstruction? It requires that the few terrain radial points used not be close to the obstacles. How does the ITM get around these problems? First, it won't even really consider obstructions (except as a delayed, somewhat questionable reaction to a change in the delta-h terrain irregularity factor) until the path length is long enough, well into the diffraction mode range at or past distance dlsa, that there are probably two obstructions to consider. Then, it uses an averaging system that I will describe in the next article.
2. As part of this averaging system, the ITM attempts to estimate the additional losses found in the LOS range by adding in diffraction estimates based on terrain diffraction losses at and after the horizon. But it uses diffraction equations intended for use only at the horizon, or after major obstructions, to do so. Dr. Harry Anderson of EDX has previously pointed out, in his 2003 book, that the use of diffraction results after the horizon to predict losses prior to the horizon, is contrary to physical laws.

   I will talk about what is being done to replace the terrain diffraction equations and make a new L-R implementation, the ITWOM, work near obstructions, using a new set of Radiative Transfer Engine (RTE) approximations to allow elimination of the averaging system for the line-of-sight and diffraction ranges, and therefore significantly increase positional accuracy, in the following articles. To look ahead, download the paper I presented at the NIST 10th annual International Symposium on Advanced Radio Technologies (ISART) in Boulder, CO, on June 4, 2008 on these new RTE equations. Click on the Current-Past Programs for free downloads of all proceedings and presentation slides from the NIST ISART website: http://www.its.bldrdoc.gov/isart/index.php.

The First ITU-T IPTV-GSI Meeting Report

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1. Background

In December 2007 the IPTV Focus Group (FG) submitted its output documents to the appropriate study groups via Study Group 13 (the parent study group of the IPTV FG) for the development of draft Recommendations based on the focus group outputs as appropriate, and for the continuation of any unfinished work.

Based on proposals developed by the chairmen of Study Group 13 and the IPTV Focus Group, it was agreed to establish an IPTV Global Standards Initiative (the IPTV-GSI) to continue activities of the IPTV FG. Its roles will centre on the speedy completion of specifications based on the documents produced by the FG IPTV as well as the detailed protocols required. IPTV-GSI is comprised of different Questions from different Study Groups (SGs) which work on IPTV related topics and meet at the same time and at the same location. IPTV-GSI follows rules designed by each specific SG and approval of its documents follow ITU-T rules. This means that when a consensus is reached on a document or draft recommendation, the document will be forwarded to the prime study group for approval.

Also, an IPTV-GSI Technical and Strategic Review (IPTV-GSI TSR) process has been set up. This process will be in effect at every IPTV-GSI event. The former chairman, Mr. Ghassem Koleyni (Nortel Networks, Canada), has been appointed as the TSR coordinator. The main task of the TSR is to facilitate the progress of the IPTV studies stemming from the results of the Focus Group on IPTV based on questions raised by other ITU-T study groups.

2. The First IPTV-GSI Event

The First IPTV-GSI event was held in Seoul, Republic of Korea from 15-22 January 2008. This event was collocated with the regular meetings of Study Group (SG) 11 and 13, and Rapporteur Groups from SG9, SG12, SG16 and SG17. Some of other related study groups also participated in this first IPTV-GSI event. There were over 200 delegates from all over the world attending this ITU event.

On the first day of the IPTV TSR meeting, Mr. Ghassem Koleyni opened the meeting and thanked the participants for their continuing support to the IPTV standardization progress. The draft agenda and work plan were presented and adopted by the attendees. In the past 20 months, the IPTV FG completed 21 output documents, covering IPTV requirements, architecture, quality of service(QoS)/quality of experience (QoE), security, digital rights management (DRM), unicast and multicast, protocols, metadata, middleware and home networks. All of FG IPTV output documents were briefly presented to the delegates by the appropriate people from former IPTV FG working groups. The allocations of these document to targeted study groups were approved, as shown in Annex A. Annex B provides the mapping of FG IPTV document numbers to the newly assigned number in IPTV-GSI, where applicable. Prior to this meeting, a total of 9 contributions were received, and these were allocated to the relevant study groups for elaboration, the detail of which can be as references listed in Annex C. At the end of the meeting, some delegates brought forward questions, most of them concerning the future disposition of the deliverables from the IPTV FG. Mr. Ghassem stated that any adoption or approval of these deliverables from FG IPTV to draft Recommendations is up to prime study groups. IPTV-GSI must abide by the ITU approval process rules.

3. Meeting Results

During the remaining time, most of the IPTV temporary documents, which namely are the deliverables from the IPTV FG, and IPTV-GSI contributions, were discussed by appropriate study groups and Rapporteur groups. The following is a summary of meeting results:

• Q.4/9, Q.5/9 and Q.13/16

Q.4/9, Q.5/9 and Q.13/16 jointly reviewed deliverables forwarded by the FG IPTV. The documents on "Application layer error recovery mechanism" - document [IPTV-GSI-TD-07] and on "Toolbox for content coding" - document [IPTV-GSI-TD-16] were studied. It was decided that for the time being, Q.13/16 will have responsibility for both documents, and collaborate with Q.23/16.

In accordance with the division of responsibilities between Q.4/9 and Q.13/16, distributed service enablers including non-broadcast terminal middleware, is to be studied by Q13/16. Broadcast centric terminal middleware will be studied by Q.4/9.

An outline for a draft new Recommendation on "Terminal Devices and end-systems for IPTV (Part1: Migration model of IPTV Terminal Devices)" was drafted to provide guidance for the IPTV terminal device industry. It included text from IPTV-GSI-TD-36.

IPTV-GSI-C2 proposes to create a new document for the IPTV terminal device architecture with the content in clause 7.2 from IPTV-GSI-TD-13.°°It was agreed that the proposal would not be pursued, since it was decided to make a Recommendation for IPTV terminal devices based on the output document "Aspects of IPTV end system - terminal device" from FG IPTV.

• Q.13/12

Q.13/12 and Q.4/13 jointly reviewed the FG IPTV deliverable: "Quality of experience requirements for IPTV services". The meeting agreed that there is a general need to ensure har-

monization of performance targets with Rec. Y.1541 . It was agreed that the document provides useful information on IPTV QoE requirements, and that it can be used as baseline text for a draft new Recommendation, G.IPTV-QoE, within Q.13/12.

IPTV-GSI TD42 contains text for new draft Recommendation G.IPTV-QoE: "Quality of experience requirements for IPTV services".

Q.13/12 and Q.4/13 jointly reviewed the FG IPTV deliverable: "Performance monitoring for IPTV". It was noted that the definitions of IP performance parameters should be related to Rec. Y.1540 . It was also noted that the work should also relate to Rec. Y.MPM (Management of performance measurement for NGN), and Rec. Y.1543 (Measurements in IP networks for Inter-Domain Performance Assessment). It was agreed that this document could be used as the basis for a series of new Recommendations within Q.13/12 on IPTV performance monitoring and that the starting point should be a draft new Recommendation focusing on defining IPTV performance measuring points, G.IPTV-PMP within Q.13/12.

IPTV-GSI-TD-45 contains text from which a draft new Recommendation G.IPTV-PMP on "Performance monitoring points for IPTV" may be derived from and also contain other material which may be used as a starting point for a series of Recommendations on IPTV performance monitoring.

• Q.1/13

Q.1/13 in collaboration with Q.2/13, Q.8/13 and Q.22/16 discussed the FG IPTV deliverable: "IPTV Service Scenario", and concluded that it should become a supplement.

• Q.2/13

The meeting participants agreed to start a draft new Recommendation Y.iptv-req, "IPTV Services Requirements", using as a baseline text the FG IPTV document on "IPTV Services Requirements" submitted to SG 13. Based on received contributions, some improvements were made to the original text from FG IPTV.

The meeting participants also agreed to defer any decision on IPTV multicast service aspects to next IPTV-GSI event. Similar decision was also made with respect to the IPTV Multicast Framework deliverable.

The meeting participants further discussed the need for an extension of NGN capabilities to support IPTV services in NGN, with the primary goal to drive NGN architectural components extensions to support IPTV services requirements.

• Q.3/13

IPTV architecture

- Agreed to adopt text from the FG IPTV as a baseline text for IPTV architecture.
- Agreed that IPTV NGN interconnection study in IPTV-GSI this would be proceed under Q.7/13.
- Tentatively agreed that the Content Delivery Functions should be clarified to encompass Distribution, Storage, and Output of content.
- Noted that the Network Functions are those in the Transport Stratum/IP layer.

IPTV network control aspects

- Reviewed the IPTV network control document submitted by FG IPTV.
- Noted that some of the material was a duplication of the Requirements document
- Noted that many of the requirements were too high level in nature to be useful in determining functional capabilities, Functional Entities (FE) or information flows between FE.

IPTV multicast frameworks

- Reviewed the IPTV network control document submitted by FG IPTV
- Noted that some of the material was a duplication of the Requirements document
- Noted that many of the requirements were too high level in nature to be useful in determining functional capabilities, Functional Entities (FE) or information flows between FE

IPTV-GSI-TD-32 contains text for draft new Recommendation Y.iptvarch: IPTV architecture.

• Q.4/13

Q.4/13 and Q.13/12 jointly reviewed the FG IPTV deliverable: "Traffic management mechanisms for the support of IPTV services", and in general noted that the document has synergy with the RACF activity in Q4/13, however, a more detailed description of mechanisms for IP traffic management is needed. Q.4/13 agreed to use this document as baseline text for a new draft Recommendation Y.IPTV-TM. The draft Recommendation will focus on the support of IPTV services and specify what mechanisms to use in order to meet related QoS requirements based on the operational environment (e.g. fast channel change and high-definition TV).

The FG IPTV deliverable of "Quality of experience requirements for IPTV services" was reviewed. It was agreed that the document provides useful information on IPTV QoE requirements, and may be used as baseline text for a new draft Recommendation, G.IPTV-QoE, within Q13/12.

The FG IPTV deliverable of "Performance monitoring for IPTV" was discussed. It was agreed that this document can be used as the basis for a series of new Recommendations within Q13/12 on IPTV performance monitoring. The starting point will be a new draft Recommendation focusing on defining IPTV performance measuring points, G.IPTV-PMP.

• Q.11/13

Q.11/13 noted the FG IPTV deliverable of the "Terms and Definitions for IPTV". The group agreed that this could become a draft new Recommendation maintained by Q.11/13. However Q.11/13 would not assume responsibility for the draft until it had reached a greater level of maturity in the IPTV-GSI.

• Q.21/16

Q.21/16 reviewed the FG IPTV deliver-

able: "Aspects of home network supporting IPTV service". The home network architecture was reviewed considering the IPTV architecture. The attendees expressed their view that there should be careful examination of the Primary and Secondary Domains. They agreed to use the FG IPTV deliverable to initiate a baseline for a draft Recommendation.

The input contribution [IPTV-GSI-C6] was also reviewed. Agreement was reached on the direction for making a Recommendation based on the FG IPTV deliverable, and its title was agreed to be "Architecture and functional requirements for Home Network supporting IPTV services".

• Q.9/17

The Q.9/17 group agreed to establish a new work item for the IPTV security aspect: X.iptvsec-1 and use the FG IPTV deliverable: "IPTV services requirements as the baseline document".

General agreement was reached by the joint meeting of Q.9/17 and Q.13/16 that all of the elements and system for IPTV security are to be studied by Q.9/17. Q.9/17 and Q.13/16 also agreed to continue to collaborate to develop the metadata for content protection. Q.13/16 will focus on the metadata related activities and Q.9/17 will focus on the development of protection mechanisms and protocol to protect metadata itself for the content protection.

4. Other Business

The next IPTV-GSI event is scheduled from 30 April to 7 May, 2008 and will be held in Geneva.

Hong Liu is a research engineer at the Communications Research Centre Canada (CRC). His current research interests include image and video processing, computer networks and multimedia communications, DTV system. Mr. Liu is a member of IEEE and BTS.

Annex A
List of FG IPTV deliverables and their allocations

Document No.	Title	Target Q/SG [Note 1]	Associated Q/SG [Note 2]	Approving SG [Note 3]
FG IPTV-DOC-0147	IPTV services requirements	Q2/13	SG11, Q9/9, Q22/16, Q9/17, Q12/17	SG13
FG IPTV-DOC-0181	IPTV architecture	Q3/13	Q9/9, Q21/16, Q9/17	SG13
FG IPTV-DOC-0182	Service scenarios for IPTV	Q1/13	Q9/9, Q8/13, Q2/13, Q22/16, Q12/17	SG13
FG-IPTV-DOC-0183	Gap analysis	[Note 5]		
FG IPTV-DOC-0184	Quality of experience requirements for IPTV	Q13/12	Q2/9,Q4/13, Q24/16	SG12
FG IPTV-DOC-0185	Traffic management mechanism for the support of IPTV services	Q4/13	Q5/11, Q16/12, Q17/12	SG13
FG IPTV-DOC-0186	Application layer reliability error recovery mechanisms for IPTV	Q23/16	Q13/12, Q17/12,Q4/13, Q14/17	SG16 [Note 6]
FG IPTV-DOC-0187	Performance monitoring for IPTV	Q13/12	Q14/9, Q14/12, Q4/13, Q24/16, Q14/17	SG12
FG IPTV-DOC-0188	IPTV security aspects	SG17	Q3/9, Q15/13, Q13/16, Q25/16	SG17
FG IPTV-DOC-0189	IPTV network control aspects	Q3/13	Q9/9, Q1/11, Q3/11, Q7/11, Q2/13	SG13
FG IPTV-DOC-0190	IPTV multicast frameworks	Q3/13	Q8/9, Q1/11, Q2/11, Q2/13, Q22/16, Q1/17, Q9/17	SG13
FG IPTV-DOC-0191	IPTV related protocols	Q1/11	Q2/11	SG11
FG IPTV-DOC-0192	Aspects of IPTV end system – terminal device	Q13/16	Q5/9	SG16
FG IPTV-DOC-0193	Aspects of home network supporting IPTV	Q21/16	Q10/9, Q9/17, Q1/15, Q4/15	SG16
FG IPTV-DOC-0194	IPTV middleware, applications, and content platforms services	Q4/9, Q13/16 [Note 4]	Q2/13	[Note 4]

FG IPTV-DOC-0195	Toolbox for content coding	Q23/16		SG16
FG IPTV-DOC-0196	IPTV middleware	Q4/9, Q13/16 [Note 4]		[Note 4]
Merged with				
FG IPTV-DOC-0194	Service navigation system	Q4/9, Q13/16 [Note 4]		[Note 4]
FG IPTV-DOC-0197	IPTV metadata	Q4/9, Q13/16 [Note 4]	Q9/17, Q10/17	[Note 4]
FG IPTV-DOC-0198	Standards for IPTV multimedia application platforms	Q4/9, Q13/16 Note 4	Q2/13	[Note 4]
FG IPTV-DOC-0199	IPTV vocabulary of terms	Q11/13 [Note 4]		SG13 [Note 6]

- Note 1: This is the question / study group that will lead the ongoing work on the deliverable.
- Note 2: These are the questions / study groups also interested in the work.
- Note 3: This is the study group that will handle the approval of the recommendation(s) resulting from the FG deliverable
- Note 4: To be decided which study group should lead the work and handle the approval of recommendation(s) resulting from the FG deliverable. Only one study group can do this but it can be done in association with other study groups.
- Note 5: To be allocated.
- Note 6: To be confirmed.

Annex B
IPTV related documents and their relationship with the IPTV-GSI documents

	FG IPTV	IPTV-GSI	
FGIPTV number	**Title**	**IPTV-GSI number ***	**Remarks/Prime**
DOC-0147	IPTV services requirements	TD 40	Y.IPTV-REQ/ (Q.2/13)
DOC- 0181	IPTV architecture	TD 32	Y.iptvarch/ (Q.3/13)
DOC- 0182	Service scenarios for IPTV New title IPTV service scenarios	TD 25	Draft supplement/ (Q.1/13)
DOC-0183	Gap analysis	TD 4	No action taken/ (Q.3/13)
DOC- 0184	Quality of experience requirements for IPTV services	TD 42	G.IPTV-QoE/ (Q.13/12)
DOC- 0185	Traffic management mechanism for the support of IPTV services	TD 27	Y.IPTV-TM/ (Q.4/13)
DOC- 0186	Application layer reliability error recovery mechanisms for IPTV	TD 7	No action taken/ (Q.13/16)
DOC- 0187	Performance monitoring for IPTV	TD 45	G.IPTV-PMP/ (Q.13/12)
DOC- 0188	IPTV security aspects	TD 43	X.iptvsec-1/(Q.9/17)
DOC- 0189	IPTV network control aspects	TD 10	No action taken/ (Q.3/13)
DOC- 0190	IPTV multicast frameworks	TD 11	No action taken/ (Q.3/13)
DOC- 0191	IPTV Related Protocols	TD 12	No action taken/ (Q.1/11)

DOC- 0192	Aspects of IPTV end system – terminal device New title IPTV Terminal Devices and End-System (Part 1: Migration model of IPTV Terminal Devices)	TD 36	Draft Rec./(Q13/16)
DOC- 0193	Aspects of home network supporting IPTV services New title Architecture and functional requirements for Home Network supporting IPTV services	TD 44 TD 37	H.iptv-hn/ (Q21/16) H.iptv-map/
DOC- 0194	IPTV Middleware, Applications, and Content Platforms New title Multimedia application platforms and end systems for IPTV	Became part of H.iptv-map TD 35 with additional text added to FG IPTV doc	(Q13/16) Need to discuss with Q.23/16/ (Q.13/16)
DOC- 0195	Toolbox for Content Coding	TD 34 and additional clause to H.iptv-map	• TD 34 is Broadcast centric terminal middleware (Q.4/9) • Rest of IPTV middleware for (Q.13/16)
DOC- 0196 DOC-0197	IPTV Middleware IPTV Metadata	•Became clause of H.iptv-map	Component of H.iptv-map /(Q.13/16)
DOC-0198	Standards for IPTV Multimedia Application Platforms	Became Annex to H.iptv-map	Annex to H.iptv-map /(Q.13/16)
DOC-0199	IPTV vocabulary of terms	TD 20	Will be update after each meeting /(Q.11/13)

* IPTV-GSI TD number reflects any update to the FG deliverable achieved during the IPTV-GSI event

* TD: Temporary Document

Annex C
List of IPTV-GSI contributions and their allocations

Number	Source	Title	Question
IPTV GSI-C 1	France Telecom	IPTV Architecture – Completion of the document reorganization	IPTV-GSI Q13/13
IPTV GSI-C 2	China Telecom	Proposal on Document of IPTV End System – Terminal Device	Q5/9, Q13/16
IPTV GSI-C 3	China Telecom	Proposal on IGMP Filter in DOC-0190	Q3/13, Q2/13, Q2/11, Q1/11. IPTV-GSI
IPTV GSI-C 4	China Telecom	Proposal on adding study item and task in Q13/SG12 for IPTV performance monitoring	Q4/13, IPTV-GSI
IPTV GSI-C 5	Huawei Technologies Co., Ltd	Proposal of Peer-to-Peer Approach for Distributed Content Distribution	Q7/11, Q3/13, Q3/11, Q2/13, Q1/11, IPTV-GSI
IPTV GSI-C 6	NTT	A proposed work procedure for FG IPTV deliverable; Aspect of Home Network supporting IPTV services	IPTV-GSI, Q21/16
IPTV GSI-C 7	France Telecom	On the integrity and the stability of the WG1 deliverables of the FG IPTV	QALL/13, IPTV-GSI
IPTV GSI-C 8	ETRI	Additional Text of Appendix II for example of IPTV Multicast VPN	Q3/13, IPTV-GSI
IPTV GSI-C 9	Cisco	Distribution of Focus Group on IPTV work between Study Groups 9 and 16	IPTV-GSI

CARL G. EILERS, 1925 – 2008
FATHER OF STEREO FM AND STEREO TV

Carl G. Eilers is considered the "Father of Stereo FM Radio and Stereo Television Sound," for pioneering work during his 50-year career at Zenith Electronics LLC. Carl Eilers died suddenly 20 June 2008 of an apparent heart attack in his River Forest, Ill., home. He was 83.

Carl Eilers joined Zenith in 1948 after receiving his bachelor's degree in electrical engineering from Purdue University. Through 1961, he worked on the world's first pay television system, Zenith Phonevision, earning key patents on subscription TV technologies.

During that period, while pursuing his master's degree in electrical engineering, which he earned in 1956 from Northwestern University, Carl Eilers led Zenith's development effort on stereophonic FM radio broadcasting. The stereo FM standard he co-developed was first adopted by the Federal Communications Commission in 1961 and is still in use today around the world.

Two decades later, as R&D manager, Carl Eilers co-developed Zenith's Emmy Award winning MTS (multichannel television sound) stereo TV system, adopted by the industry in 1984. Through the 1990s, Carl Eilers was a key member of Zenith's high definition television (HDTV) development team.

Over the years, Carl Eilers had been granted 21 U.S. patents, and authored numerous technical papers and articles. He was always been recognized as a great teacher and mentor to scores of young engineers, both at Zenith and throughout the television, radio and audio industries.

Carl Eilers' contributions were honored by two technical Emmy Awards for Zenith developments, stereo TV in 1986 and HDTV in 1997.

His many other honors included the 1977 Fellow Award from the Institute of Electrical and Electronics Engineers (IEEE), the Best Paper Award of the IEEE Broadcast Technology Society in 1984, the Audio Engineering Society Fellow Award in 1993 and the IEEE Masaru Ibuka Consumer Electronics Award in 1994 ("for pioneering contributions to FM stereophonic and television multichannel sound broadcasting systems"), as well as Zenith's E. F. McDonald and Robert Adler technical excellence awards.

Carl Eilers was inaugurated into the Consumer Hall of Fame in 2000. The Consumer Electronics Association (CEA) recognized him for "high-fidelity stereo sound that revolutionized the radio listening experience," as well as enhancing the TV viewing experience. CEA said Carl Eilers "holds a unique place in the annals of consumer electronics technology history as co-developer of two key industry standards…."

He had been a member of the Institute of Electrical and Electronics Engineers (IEEE) since 1947, the Society of Motion Pictures and Television Engineers (SMPTE) since 1956, and the Audio Engineering Society (AES) since 1973. He served as both a member and chairman for a number of their special committees.

He served in the United States Navy from 1943 to 1946. He graduated from Purdue University, West Lafayette, Ind., with his bachelor's degree in electrical engineering, in 1948, and received his master's degree in electrical engineering from Northwestern University, Evanston, Ill., in 1956.

Carl Eilers was born March 21, 1925 in Fairbury, Ill. He and his wife of 34 years, Sandra (nee Mahler), were long-time residents of River Forest, Ill. In addition to his wife, he is survived by his son John Eilers and daughter Janet Ames.

58th ANNUAL IEEE BROADCAST SYMPOSIUM

15-17 October 2008 **Westin Hotel, Alexandria, VA USA**

SAVE THE DATE!

"Managing the Transitions"

Topics may include:

Papers on digital radio and television broadcasting, technical aspects of the termination of analog television broadcasting in the US next year, how IP becomes more involved in broadcasting, how handheld and mobile applications and standards will evolve for broadcasting, and a series of academic papers aimed at increasing familiarity with new technological developments not directly related to broadcasting as we know it.

Keynote Luncheon Speakers:

Joint BTS/AFCCE Luncheon - Thursday, 16 October

Richard Wiley, head of top communication law firm Wiley Rein, former FCC chairman, former chairman of the FCC committee on advanced television and so much more.

BTS Awards Luncheon – Friday, 17 October

Peter M. Fannon, VP Technology Policy for Panasonic US, former president of Advanced Television Test Center (ATTC), and chair of CEA Government Affairs Council.

This event will now offer **Continuing Educations Units (CEUs)** for attending the technical sessions. Most consultants and PE's know that those are often required to maintain professional engineer licenses. Please feel free to request the CEU accreditation when you register for the conference.

For details visit the Broadcast Symposium web site:
www.ieee.org/bts/symposium

IEEE

BTS IEEE Broadcast Technology Society

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Call for Papers

13 -15 May 2009 - Bilbao, Spain

The IEEE International Symposium on Broadband Multimedia Systems and Broadcasting 2009, the fourth in the series, will be held in Bilbao, Spain (http://www.ieee-bmsb2009.org). The symposium will be a premier forum for the presentation and exchange of technical advances in the rapidly converging areas of multimedia broadcasting, telecommunications, consumer electronics, and networking technologies.

The symposium seeks technical papers on the following topics:

1. ***Multimedia systems and services***
   - 1.1 Mobile TV
   - 1.2 IPTV & Internet TV
   - 1.3 DTV and broadband multimedia systems
   - 1.4 VoD, interactivity, datacasting
   - 1.5 Field trials and test results
   - 1.6 Content management
   - 1.7 Service deployments
2. ***Multimedia devices***
   - 2.1. Display technology
   - 2.2. Acquisition technology
   - 2.3. Set-top box and home networking
   - 2.4. Mobile, portable, and handheld devices
   - 2.5. Program guides and navigation
3. ***Multimedia quality: Performance evaluation***
   - a. Performance evaluation
   - b. Objective evaluation techniques
   - c. Subjective evaluation techniques

(2) Multimedia processing

- 4.1. Audio technology
- 4.2. Video coding and processing
- 4.3. Content adaptation and scaling
- 4.4. Error resilient and concealment
- 4.5. Rate control
- 4.6. Retrieval and indexing
- 4.7. 3-D and multi-view video
- 4.8. Content protection and watermarking

(1) Transmission and networking

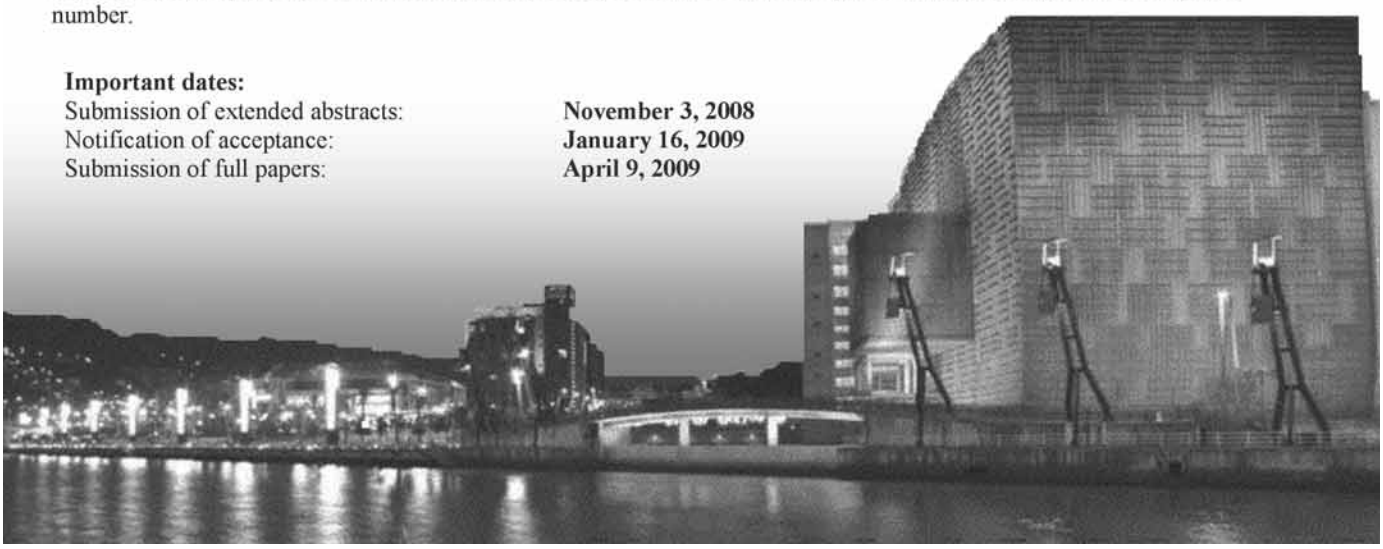
- 5.1. Channel modeling and simulation
- 5.2. Channel coding, modulation, multiplexing
- 5.3. Signal processing for transmission
- 5.4. Propagation and coverage
- 5.5. Congestion control
- 5.6. Traffic and performance monitoring
- 5.7. Networking and QoS

Call for Tutorials: Proposals for half-day tutorials are also solicited based on the topics listed above.
Call for Panels: Proposals are solicited for panels on technology, application, business, and policy-related issues and opportunities for multimedia and broadcasting industry.

Prospective authors are invited to submit extended abstracts of about 1000 words by e-mail to **bts@ieee.org.** Each abstract must include at least two ***key words*** chosen from the topics mentioned above. **Please indicate that the abstract is submitted to the *IEEE International Symposium on Broadband Multimedia Systems and Broadcasting 2009*,** and include the corresponding author's full name and contact information including: Affiliation, address, e-mail, and phone number.

Important dates:

Submission of extended abstracts:	**November 3, 2008**
Notification of acceptance:	**January 16, 2009**
Submission of full papers:	**April 9, 2009**



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IBC is committed to providing the world's best event for everyone involved in the creation, management and delivery of content for the entertainment industry. Run by the industry for the industry, IBC is owned by six Partners who represent both visitors and exhibitors. Uniquely, the key executives and committees who control the convention are drawn from these organizations, bringing with them experience and expertise in all aspects of our industry.

IBC2008 show dates

IBC returns to the RAI Centre in Amsterdam this year.
Conference: Opens on 11 September.
Exhibition: 12 to 16 September.

IEEE Broadcast Technology Society Tutorial at IBC

"Quality Issues with TV and Multimedia over IP"

Thursday, 11 September 2008 from 10:00am to 1:30pm

This tutorial discusses the quality issues in IP systems delivering TV and other Multimedia services. It consists of several talks covering:

1. Quality of Service (QoS), Quality of Experience (QoE) and Quality of Perception;
2. Quality issues of networks;
3. Quality issues of audio/video content (lip sync, re-distribution, trans-coding);
4. Quality issues in IP delivery set-top boxes;
5. Quality issues in TV and Multimedia data services over IP (metadata, EPG, content navigation).
6. Practical issues experienced when installing and deploying TV over IP networks
7. Panel Discussion

The 5th International Forum of Digital TV & Wireless Multimedia Communication (5th IFTC)

November 7th-8th 2008, Shanghai China,

Hosted by: Shanghai Image & Graphics Association (SIGA)

The 8th China International Industry Fair (CIIF), which is sponsored by National Development and Reform Commission (NDRC), Ministry of Science and Technology, Ministry of Information Industry, Chinese Academy of Science and Shanghai Municipal Government, will be held in Shanghai in November 2008. As an important part of CIIF 2008, the 5th International Forum of Digital TV and Wireless Multimedia Communication (5th IFTC), which is directed by Shanghai Municipal Informatization Commission (SMIC), Shanghai Municipal Science and Technology Commission, Shanghai Association of Science and Technology (SAST) and hosted by SIGA, is a summit forum in the field of digital TV and multimedia communication. The Forum is co-hosted by such organizations and communities as Shanghai Jiao Tong University, Shanghai Information Household Appliance Trade Association (SIAA), IEEE BTS Chapter of Beijing Section, Chinese Journal of Image and Graphics (CJIG), Shanghai Institute of Communication, Shanghai Society of Motion Picture and Television Engineers (SSMPTE).

The 5th IFTC aims at extensively exchanging the latest information of digital TV and wireless communication industries around the world as well as the relevant policies of industry authorities and communicating the development trend and research achievements in the related realm of digital TV, IPTV, Mobile Phone TV, Content and Security Management, Web Video Retrieval, Broadband Multimedia and etc. The Forum is to enhance and promote the technology, equipment and application in the field of digital TV and multimedia to a new stage by comparing the characteristic, framework, significant techniques and their maturity, analyzing the performance of various applications in terms of extensibility, upgradeability, manageability and portability and discussing the interfaces among varieties of networks and platforms. Marked by the adoption of digital television terrestrial transmission standard, the Forum is to take the opportunity of the upcoming Beijing 2008 Olympic Games and Shanghai 2010 World Expo to further promote the large-scale industrialization of digital TV in China in an all-round way. The International Forum will provide powerful technical supports and assurance for the development and innovation of digital TV and wireless multimedia communication industries of China, and serve as a bridge of mutual exchange between China and the world outside. In the beautiful autumn season, we warmly welcome international and domestic experts and scholars, government officials and industry leaders to Shanghai to share your visions on digital TV and wireless multimedia communication with us.

The thematic topics of 5th IFTC include digital TV, IPTV, Mobile TV, Mobile multimedia communication, content and security management, web video retrieval and etc. Prospective authors are invited to submit manuscripts on topics including but not limited to:

1. IPTV
2. Mobile Phone TV
3. Digital TV Broadcasting
4. Interactive TV
5. Source Coding (AVS, H.264)
6. Advanced Channel Coding
7. Wireless Multimedia Communication
8. Mobile Multimedia
9. New Advances in Broadband Multimedia
10. CMMB, DVB-H, T-DMB, etc.
11. Content, Security and Copyright Management
12. Image Processing and Pattern Recognition
13. Application of Image and Graphics Technique
14. Web Video Retrieval

The forum program will include keynote and invited speakers, contributed papers; oral and poster sessions. The papers will be reviewed by both the program committee members of the Forum and the peer reviewers of Chinese Journal of Image and graphics. **The selected papers will be published in the 10th issue of Chinese Journal of Image and Graphics 2008 as regular papers**. Each accepted paper will be allowed an oral presentation. The authors should prepare their manuscript according to the MS Word template and the format requirements of Chinese Journal of Image and graphics given in the conference website and submit an MS Word version of their papers no more than 4 pages per paper through email-based submission. Please see the conference website (www.siga.com.cn/iftc2008) for details.

Important Deadlines:

June 20th, 2008 Deadline of Paper Submission;

July 1st, 2008 Author Notification;

July 15th, 2008 Submission of Final Papers and Payment of Registration and Pages Charge;

Nov 7th -8th, 2008 Date of Forum.

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27TH INTERNATIONAL CONFERENCE ON CONSUMER ELECTRONICS 2009

Conference Theme: Programmable Consumer Electronic Devices

The International Conference on Consumer Electronics (ICCE) is soliciting technical papers for oral and poster presentation at ICCE 2009. Now in its 27th year, ICCE has a strong conference history coupled with a tradition of looking forward attracting leading authors and delegates from around the world. Papers reporting new developments in all areas of consumer electronics are invited, including but not limited to those listed below. Student papers and papers of a tutorial nature are particularly encouraged. This year, papers relating to Programmable Consumer Electronic Devices are particularly sought for a special session.

TOPICS

HOME ENTERTAINMENT
Home Gateway, DTV, Home Theater, PVR, Interconnects, Game Systems, Interactive and Directed Programming, Internet Integration, Advanced DVD and CD, Displays

MOBILE COMPUTING & COMMUNICATION
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A/V TECHNOLOGY
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Antennas, Acquisition, Equalization, Spectrum Usage, Software Radio, Wireless LAN, 802.11 Standards, Bluetooth, RFID, WPAN

CONSUMER NETWORKS
Wired & Wireless Multimedia, QoS, Security, Peer-to-Peer, Internet Appliances, Home Control, Bridges, Interoperability, Application Control, Home Architecture and Healthcare Applications

AUTOMOTIVE ENTERTAINMENT & INFORMATION
Navigation, A/V Systems, Driver Assistance, Networks, Communication Aspects, Sensors and Control

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ENABLING TECHNOLOGY
Advanced Semiconductors, High Speed Signals & Interconnects, Algorithms, O/S, Development Tools, Test Equipment, Advanced Displays, Power and Conventional Batteries, Small Fuel Cells, Standards, Intellectual Property, Cost Reduction, Compliance Testing, Human-Computer Interface, Special-Needs/Assistive Technology, Recyclable / Green Engineering

AUTHOR'S INFORMATION

Deadline for Paper Submissions
June 22, 2008

Notification of Acceptance
September 05, 2008

Camera-Ready Paper Due
October 3, 2008

Authors are invited to submit a 2-page summary according to the posted submission guidelines. Only electronic submissions will be accepted via the web at http://www.icce.org.

At least one author of each paper MUST pre-register for the conference by October 3, 2008 for papers to be included in the program.

Tutorials are scheduled for Jan 10-11, 2009. Brief proposals should be submitted by June 1, 2008 to sorin.stan@philips.com.

Proposals must include title, abstract, detailed outline, as well as bio and contact information for the presenter.

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Announcing an invitation to attend

The Wireless Station at Brant Rock

IEEE Milestone Dedication

Marshfield and Brant Rock, MA USA

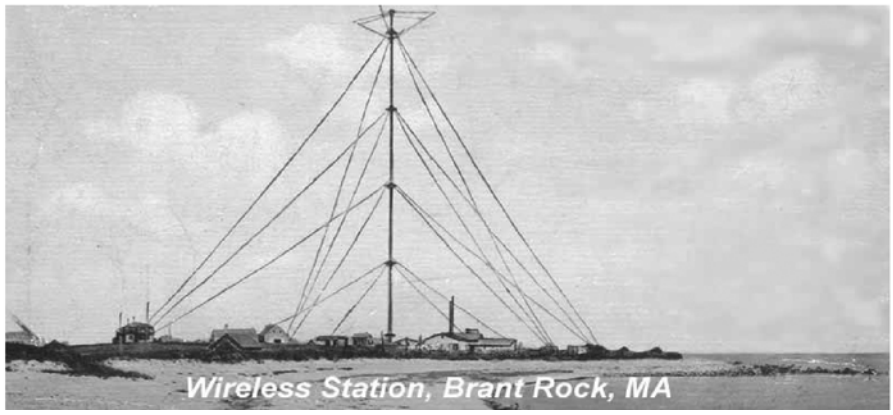
Date of dedication: 13 September 2008

There will be a dedication and installation of a milestone plaque for the First Wireless Radio Broadcast. This particular milestone promises to be well received by the general public, town officials, and IEEE members. The Milestone Organizing Committee is planning a full day of activities to commemorate this technological marvel. The program will begin at 8 am (tentative) with registration and coffee, and will be followed by keynote speakers, the plaque ceremony, buffet lunch and a tour of the remaining wireless tower at Brant Rock.

Plaque title: First Wireless Radio Broadcast by Reginald A. Fessenden, 1906

Attendance is free but limited. Pre-registration is required.
Please contact the Boston Section, Linda Scott at l.scott@ieee.org
Additional event information will be posted on
http://fessendenmilestone.quartomese.com/

This milestone event is co-sponsored by the IEEE Boston Section,
the IEEE Broadcast Technology Society, and the IEEE Communications Society



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