the standard

Advanced Television Systems Committee Inc.

News from ATSC, Volume Seven, Issue Three, October 2006

TRANSPORT VERIFICATION RP

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

Document A/78, "ATSC Recommended Practice: Transport Stream Verification," outlines a common methodology for describing transport stream conformance criteria for digital television. This document explicitly describes the elements and parameters of ATSC Standards A/53 and A/65 that should be verified in a transport stream for it to be considered a proper emission; it does not cover RF, captioning, or elementary streams.

Work on A/78 was led within the TSG-1 specialist group by Dr. Richard Chernock of Triveni Digital. Dr. Chernock observed, "The broadcasters focus has shifted from getting DTV on the air to keeping it working correctly. Monitoring is a key component to achieve this goal. A/78 provides important guidance, allowing attention to be prioritized from the most important impairments to those that represent nuisances. The work that led up to A/78 represents contributions from all segments of the industry."

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

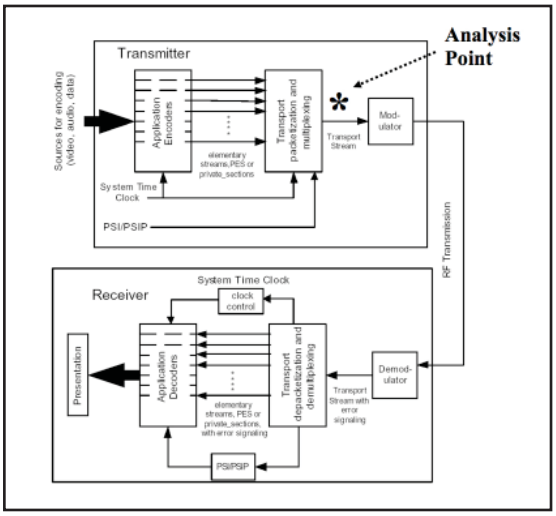

Figure 1 A/78 reference analysis point in the DTV system.

A/78 identifies transport stream issues by type, dividing errors into the general following categories:

- PSI errors
- PSIP errors
- Timing model and buffering errors

Continued on Page 2

Transport Verification Stream... (Continued from Page 1)

• Consistency errors

• General errors

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

• **Transport Stream Off-Air:** The station is effectively off-air as the transport stream errors are severe enough that transport level logical constructs are damaged beyond utility.

• **Program Off-Air:** A main service (virtual channel) is flawed to the point that that the service is effectively off-air for conformant/reasonable receiver designs.

• **Component Missing:** One or the program components that is signaled by PSIP or the Program Map Table (PMT) as present is either not present or cannot be found and decoded.

• **Quality of Service:** Parameters are out of specification by such a margin that a significant fraction of the receivers can be expected to produce flawed outputs.

• **Technically Non-Conformant:** Violates the letter of the standard, but in practice will have little effect on the viewing experience.

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

A/78 may be downloaded from the ATSC Web site at http://www.atsc.org/standards.htm. ■

ACAP Signaling Standard Approved

The ATSC has given final approval to a new standard designed to support the Advanced Common Application Platform (ACAP, document A/101). The new standard—A/102, *"ACAP Service Signaling and Announcement"*—augments the MPEG-2 transport signaling defined in the ACAP standard by specifying the required signaling for current services and the mechanism for announcement of future services. It also includes the necessary integration with PSIP (A/65), especially when the ACAP service is related to video/audio programming.
There are three announcement types according to the ACAP data service scenarios:

• Standalone data service announcement, designed to announce an independent data service in a Virtual Channel that does not include any audio-visual event.

• Program-related data service announcement, designed to announce an ACAP data service that is related to a video/audio program and has the same start time and duration and title as a video/audio program.

• Program-related but separate data service announcement, designed to announce a separate data service that is related to a video/audio program but with a different start time and duration, or a separate title from a video/audio program.

In order to announce the ACAP data service, an announcement descriptor was found to be needed. This descriptor, originally defined by DVB, identifies the type of the data component and may be used to provide a text description of the data component.

Michael Dolan, Chair of TSG/S13 – the group that developed the standard, added: "It was important that A/102 was designed to be compatible with the announcement and signaling mechanisms in use today by ATSC equipment today extending it only as necessary to provide a final integration of ACAP with ATSC programming".

A/102 may be freely downloaded from the ATSC Web site at http://www.atsc.org/standards.htm. ■

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WENDELL BAILEY REMEMBERED

The television industry has lost a devoted colleague, dedicated advocate, and beloved friend. Wendell Bailey passed away September 26, 2006.

As a representative of NCTA, Wendell helped found ATSC in 1982, and served on our Executive Committee for many years. The cable industry veteran served 17 years as the National Cable and Telecommunications Association vice president of science and technology.

He also served as the chief technologist of advanced broadband technology for NBC for five years and previously held positions at AT&T and MCI.

CED Magazine named Bailey "Man of the Year" in 1988, and he was named "Fellow" of the Society of Cable Television Engineers in 1997. Among other things, we will miss his technical expertise and sense of humor.

A private, family ceremony was held September 29 in Maryland.

If you would like to make a donation on Wendell's behalf, please do so through the American Cancer Society:

https://www.cancer.org/docroot/DON/DON_1_Donate_Online_Now.asp?from=hpglobal

ATSC and TV-GPS

By Jon Metzler, Rosum

In recent years, terrorist threats and natural disasters have affected every aspect of our daily lives. Events such as these also brought to light the improvements still to be made in the country's communications and emergency response systems. For example, GPS signals work well for some emergency response systems - that is, until they have to go indoors, where GPS signals do not penetrate.

One ATSC member company is working on solutions for just such a dilemma. Rosum Corporation is using TV signals to supplement GPS signals, so devices can seamlessly travel from outdoors to indoors and back again. In urban areas, TV signals are plentiful, powerful, low and diverse in frequency, making them optimal for urban-area and indoor positioning applications. Possible applications go beyond emergency services- such signal applications can be used to monitor criminals on probation, or fleet management.

For position location, TV signals have several advantages over GPS signals. One is power: Typical TV broadcasts are about 1 megawatt, versus 500 watts for GPS signals. The second advantage is television's lower broadcast frequency, which enables TV signals to go through walls, buildings and cars – indeed, as they were originally designed. Finally, TV signals are frequency-diverse, with each tower broadcasting several channels; a GPS satellite broadcasts one channel, at 1575 MHz.

Rosum's position location system comprises three parts: first - a mobile device, such as a mobile phone equipped with a TV tuner and a baseband TV measurement module that receives TV signals and calculates pseudoranges (time-of-flight estimates from TV transmitters); second - a location server for calculation of position; and third - a regional monitor unit that measures certain clock characteristics of TV signals, and sends time correction data to the location server.

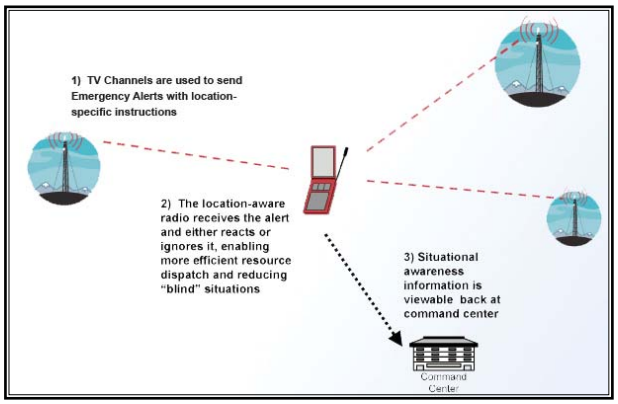
Continued on Page 4

TV-GPS (continued from Page 3)

A communication channel is required between the TV measurement module and location server, and between the regional monitor unit and location server.

In sum, Rosum transforms the commercial TV infrastructure into something similar to a high-power, multi-frequency terrestrial GPS.

Within the broad realm of ATSC activities, there are two activities to which TV-positioning may be particularly complementary.



How TV based positioning works today (image courtesy Rosum)

Given the growing prevalence of connected (WiFi or cellular) mobile devices and the growth in mobile devices capable of receiving over-the-air TV signals, the future TV viewing experience may be a mobile experience, or at least a "nomadic" experience, such as on a train, or at a bus stop, or in a taxi cab.

Synchronization of transmitter frequency and timing, will allow for creation of SFNs (Single-Frequency Networks), in which multiple on-channel transmitters can be operated by a single broadcaster. From Rosum's perspective, the synchronized transmitter approach has the fortuitous side effect of making broadcast TV more similar to GPS (Global Positioning System) signals. GPS can be thought of as a single-frequency network coming from many different satellites, each of which has an atomic clock on board as its clock source, with all emissions synchronized to a common clock. Since TV emissions are not synchronized in this way today, Rosum has built a TV-based positioning system by continuously calibrating individual TV stations using regional monitor stations (reference stations). Synchronizing TV emission times to a common timebase, for example through the use of GPS, would enable a number of safety benefits, from the use of TV as a precision clock source to autonomous position location of receivers, for either public safety or commercial service purposes. For example, a regional broadcaster could send multiple content streams, e.g. programming or advertisements, and the location-aware receiver would then demodulate only the stream pertinent to it. This could also be useful from a DRM perspective, so that content can be embargoed at regional or national boundaries.

The work on advanced emergency alerting recently approved by the ATSC Board of directors is an important step. Incidents of the past several years - 9/11, Katrina - have shown the importance of being able to transmit public warnings rapidly and effectively. TV's wide bandwidth makes it an ideal platform to disseminate rich alerts to first response personnel and consumer devices. The Association of Public Television Stations (APTS) datacasting trial with FEMA is one example of an effort to utilize this already-existing asset. One advantage of TV, in addition to its capacity, is its quality-of-service vis-à-vis cellular networks, which generally are not as robust to outages as are TV transmission sites. Additionally, using TV to serve rich alerts instead of simple text crawls would enable consumer or public safety officials to see (or hear!) with much greater clarity what precisely has occurred. The addition of location-awareness to alert receivers would enable geotargeted alerts, or tiered alerts. ■

Profile: CB Patel, Samsung

CB Patel is a well-known part of ATSC activities. Easily recognized by the big smile always spreading across his face, this charismatic member is ready to lend a helping hand whenever and wherever he can.

CB is employed as a consultant with Samsung, a position he has held since 1997.

He began his career at the R&D Lab of Admiral TV, in Chicago, designing all Solid-State B&W TV. He then moved on to Philco, and then to Sarnoff where he "really got my TV System background. "

CB worked as a Senior member of the Technical Staff at David Sarnoff Research Center (DSRC) in Princeton, NJ, working there from 1974 to 1987, and again in 1989. From 1989 to 1994, CB was employed with the Samsung Advanced Media Lab (AML) in Lawrenceville, NJ.

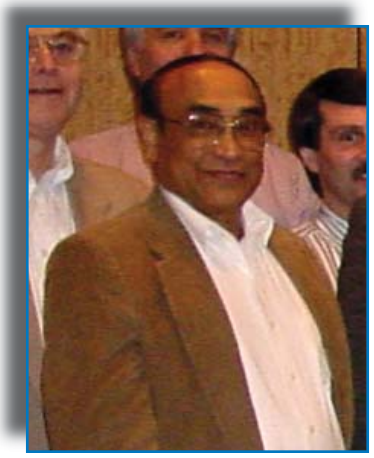
His educational background is also impressive. He has earned both his MS and PhD in electrical engineering from Michigan State University in East Lansing, MI; and has also completed a slew of Technical Advancement courses.

Not only a heavy participant in ATSC, CB also works on CEA DTV Standards activities.

Besides the affectionate self-moniker - "Mark Richer's Trouble-Maker," CB has other, even more impressive, achievements. He holds several patents in analog as well as digital television. He is also the recipient of two Sarnoff Achievement Awards, and two Appreciation Awards from Samsung, awarded in March 1994 and November 2005.

CB and his wife Nancy reside in Trenton, NJ. Nancy is a Social Worker at the Ann Klein Forensic Center. CB's daughter, Danielle, is a high school math teacher in West Windsor, NJ and his son Akash, is an avid fisherman, currnetly attending Humboldt State University in Arcata, CA.

When CB isn't involved with his many career responsibilities, he and his wife enjoy traveling the countryside of India. ■



CB Patel, Samsung, with the RF Task Force in 2003.

Above: CB and Bob Plummer in an animated discussion at the 2006 NAB ATSC DTV Hotspot in Las Vegas.

CB enjoying the 2006 Annual Meeting in Chantilly, Va.

ATSC would like to congratulate the following members for their prestigious industry awards:

2006 SMPTE David Sarnoff Medal Award

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

Advanced Television Systems Committee, Inc.

To join ATSC,
call us,
202 872-9160
fax us,
202 872-9161
or log on to
www.atsc.org

Welcome Wagon

ATSC would like to welcome it's newest members:

General Motors, MStar Semiconductor, Inc., Ryerson University, and Telegent Systems.

These companies have recently become members. We eagerly anticipate their contributions to the DTV standards currently being developed in the ATSC, and we know their participation will have an immeasurable effect on the future of digital television.

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ATSC 2007 ANNUAL MEETING

The 2007 Annual Meeting has been scheduled! The official date for the annual meeting has changed due to scheduling conflicts - the new date is May 17, 2007. The meeting will be held at the Pentagon City Ritz-Carlton Hotel in Arlington, Va. The hotel is minutes away from Reagan National Airport and is accessible by Metro. More information will follow in the upcoming months, but if you have any questions, please contact Lindsay Shelton-Gross at lsheltongross@atsc.org.

Visit the ATSC calendar online at http://www.atsc.org/technicalmeetings.html