May 14, 2012

Radio TechCheck

NAB NATIONAL ASSOCIATION OF BROADCASTERS

The Weekly NAB Newsletter for Radio Broadcast Engineers

Reminder: June 30 EAS CAP Deadline

No later than June 30, 2012, all broadcast stations must have CAP capable EAS equipment installed and operating in their facilities. FCC rule 11.56 requires all broadcasters to have equipment installed and operating that can receive and decode National Level (federal) Emergency messages (EANs) encoded in the Common Alerting Protocol (CAP) format.

The original CAP compliance deadline was March 31, 2011. In response to a petition filed by NAB and others, the FCC extended that dead line to September 30 2011. On Friday September 16, 2011, the FCC released an order further extending the deadline to June 30, 2012.

This requirement was reaffirmed in the most recent FCC EAS Report and Order released January 10, 2012 (Fifth Report and Order in EB Docket No. 04-296 – "5th R&O"). The rules adopted in the 5th R&O also require broadcasters to interface with and monitor FEMA's Integrated public Alert and Warning System (IPAWS) server for those federal CAP-formatted EAS messages. However, because IPAWS monitoring will be largely conducted via an Internet connection, the FCC will consider, on a case by case basis, applications for waivers from this monitoring requirement based on the physical lack of availability of broadband.

The 5th R&O is available here (http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-12-7A1.pdf.). The order extending the Cap compliance deadline is here (http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-11-136A1.pdf).

Mobile DTV as a Digital Radio Distribution Platform

A session at this year's NAB Broadcast Engineering Conference (BEC, April 14-19, 2012, Las Vegas, Nev.) entitled "*Mobile DTV Update: Domestic and International*" includes a paper, excerpted here, which describes the application of mobile DTV technology to audio-only services. This paper is entitled "*Mobile DTV as a Digital Radio Distribution Platform*," and was written by Joe Igoe, VP and CTO, WGBH, Boston, Mass.

NABSHOW Where Content Comes to Life

INTRODUCTION – the typical mobile DTV offering involves an existing DTV broadcaster adding equipment to the broadcast chain to enable clear-to-air mobile DTV services. An alternative use case is in audio service distribution. DTV broadcasting has significant capability to carry large amounts of unidirectional data. Recent advancements in MPEG2 encoding continue to widen the margin between the bandwidth required to carry an acceptable HDTV broadcast and the total capacity of an ATSC DTV stream. This paper will show that a small number of television broadcasters in a market could package and digitally broadcast all of the existing local radio broadcasts or other audio services.

ATSC CAPACITY – an ATSC broadcast provides a usable data capacity of approximately 19.39 Mbps. What can be done with this capacity is the subject of endless debate, and remains a moving target with the continual advances made in encoding technology. For consistency and simplicity, the following examples will use a value of 12 Mbps for HDTV signal encoding. With 19.39 Mbps capacity in an ATSC broadcast, less the 12 Mbps allocated to an HDTV service, 7.39 Mbps remains available. Bandwidth is allocated to mobile DTV in groups of 917 kbps. For the purposes of this paper, we will assign seven groups to M/H for a total of 6.4 Mbps.

MOBILE DTV CAPACITY – with 6.4 Mbps assigned to mobile DTV and mixed rate efficiency of 26%, we have roughly 1.66 Mbps available for mobile content. This is sufficient bandwidth for a wide variety of options as shown in the table. Suggested in the table are eight possible allocations for this 1.66 Mbps of Mobile DTV capacity. Option 1 envisions a broadcaster providing an HDTV signal and 25 "high quality" (64 kbps) audio services. At the other extreme, option 5 shows HD along with 69 "low quality" (24 kbps) services.

SFCMM IN TV – there are more possible alternatives to consider beyond those described above. For example, at present mobile DTV resides within a DTV broadcast along with a traditional DTV service, to be in compliance with FCC rules and to provide for backwards compatibility. Currently the ATSC is considering a candidate standard that would amend A/153 Part 1 (the ATSC Mobile DTV Standard) to add a non-backwards compatible, Scalable Full-Channel Mobile Mode (SFCMM). SFCMM would allow for the complete use of a DTV broadcast frequency for possible future mobile DTV applications. Given the assumptions about forward error correction stated above, this could provide 5 Mbps of usable payload for mobile DTV services in 6 MHz of spectrum. While this would preclude any traditional DTV services, it would allow for in excess of 75 audio services at 64 kbps.

CONDITIONAL ACCESS – the existing systems and software fully support clear-to-air mobile DTV, but The Mobile 500 Alliance and the Dyle Mobile DTV (the two consortia working on delivery of a mobile DTV service) are both introducing systems with conditional access to enable their business models. A similar application of this technology in the radio space could permit a multi-tiered service in which some stations are free and some are subscription. The demand for satellite radio services suggests that many consumers would willingly pay a premium for a commercial-free version of their favorite music station, or a pledge-free version of their favorite NPR station.

Mr. Igoe's paper is included in its entirety in the 2012 NAB BEC Proceedings, available on-line from the NAB Store (www.nabstore.com). For additional conference information visit the NAB Show web page at www.nabshow.com.

IEEE Broadcast Technology Society Issues Call for Papers

A Call for Papers has been issued for the 2012 IEEE Broadcast Symposium, to be held October 17-19, 2012, in Alexandria, Va. The Symposium Committee seeks timely and relevant technical papers relating to all aspects of broadcast technology, in particular on the following topics:

- Digital radio and television systems: terrestrial, cable, satellite, Internet, wireless
- Mobile DTV systems (all aspects, both transmission and reception)
- Technical issues associated with the termination of analog television broadcasting
- Transmission, propagation, reception, re-distribution of broadcast signals
- AM, FM, and TV transmitter and antenna systems
- Tests and measurements
- Cable and satellite interconnection with terrestrial broadcasters
- Transport stream issues – ancillary services
- Unlicensed device operation in TV white spaces
- Advanced technologies and systems for emerging broadcasting applications
- DTV and IBOC reception issues and new technologies
- ATSC and other broadcast standards developments
- Broadcast spectrum issues – re-packing, sharing

The submission deadline for abstracts has been extended to May 31, 2012. Visit the symposium website for additional information. This Symposium is produced by the IEEE Broadcast Technology Society.

NUMBER OF POTENTIAL AUDIO SERVICES IN 6.4 Mbps MOBILE DTV SIGNAL

Option	High quality (64 kbps)	Medium quality (32 kbps)	Low quality (24 kbps)
1	25		
2	15	20	
3	10	10	25
4		50	
5			69
6	20		15
7	15		28
8		42	9