NAB Radio TechCheck

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Arbitron PPM Information for Broadcast Engineers

The Arbitron Portable People Meter (PPM) audience measurement system is now the ratings "currency" in Philadelphia and Houston-Galveston, which means that PPM data has fully replaced the traditional diary data in these markets (a schedule for the conversion of other markets is shown right). Last week, broadcast engineers in the Washington, DC and Baltimore markets were invited to visit Arbitron's Columbia, MD facility for a technical briefing on PPM technology, co-sponsored by Society of Broadcast Engineers (SBE) chapters 37 (District of Columbia) and 46 (Baltimore).

Three particular components of the PPM system—the encoder, the station monitor, and the PPM itself— were discussed in detail at this briefing which was led by Mr. Sam Brown, Broadcast Engineer with Arbitron:

The encoder – Station ID, Program ID, and time tag information are inaudibly added to a radio station's audio signal in the encoder using Arbitron's patented Critical Band Encoding Technology (CBET). Every AM and FM station in a PPM market is offered the encoders it needs to encode its main-channel audio signal free-of-charge, whether that station actually subscribes to Arbitron's rating service or not. The encoder (height 1U) fits into a standard studio equipment rack and becomes part of the audio "air chain," providing continuous, real-time stereo encoding of program material as it is broadcast. All encoders are installed as redundant pairs to enhance system reliability. This equipment is self-monitoring to ensure continuous operation and noninterference with the broadcast, and will bypass itself in the event of a power failure or fault detection.

Two different models of encoder were shown at the briefing, one for analog audio and one for digital (AES) audio. Arbitron broadcast engineers work closely with station engineers to determine the best location(s) for the encoders and pre-configure each encoder with call sign, sample rate (for digital audio), etc., prior to shipping it to the station. Once shipped, stations have 30 days to get the encoders on-the-air so Arbitron recommends that stations pre-wire their facilities to accommodate the encoders before requesting shipment.

Arbitron is making encoders available for HD Radio multicast and streaming Internet audio signals (non-subscribers will pay a fee for these), and is scheduled to begin reporting listening to these later this year.

The station monitor – every station that broadcasts a PPM signal must install PPM station monitors so they can check to see that the over-the-air broadcast is being encoded properly. These monitors are also provided to the station free-of-charge by Arbitron (except for non-subscribers' HD Radio multicast and streaming Internet audio signals). The monitor will alert station engineers if it receives an incorrectly encoded signal, or a signal that is not encoded at all. At the briefing, Mr. Brown and his colleagues emphasized how important it is that the encoding be present at all times on the signal, for without it absolutely no listening can be measured.

Arbitron PPM™

Market	Currency Date
Philadelphia	Mar 2007
Houston-Galveston	Jun 2007
New York	Sep 2008
Nassau-Suffolk (Long Island)	Sep 2008
Middlesex-Somerset-Union	Sep 2008
Los Angeles	Sep 2008
Riverside-San Bernardino	Sep 2008
Chicago	Sep 2008
San Francisco	Sep 2008
San Jose	Sep 2008
Dallas-Ft. Worth	Dec 2008
Washington, DC	Dec 2008
Detroit	Dec 2008
Atlanta	Dec 2008
Boston	Mar 2009
Miami-Ft. Lauderdale-Hollywood	Jun 2009
Seattle-Tacoma	Jun 2009
Phoenix	Jun 2009
Minneapolis-St. Paul	Jun 2009
San Diego	Jun 2009
Tampa-St. Petersburg-Clearwater	Sep 2009
St. Louis	Sep 2009
Baltimore	Sep 2009
Denver-Boulder	Sep 2009
Pittsburgh, PA	Sep 2009
Portland, OR	Dec 2009
Cleveland	Dec 2009
Sacramento	Dec 2009
Cincinnati	Dec 2009
Kansas City	Mar 2010
San Antonio	Mar 2010
Salt Lake City-Ogden-Provo	Mar 2010
Las Vegas	Mar 2010
Milwaukee-Racine	Jun 2010
Charlotte-Gastonia-Rock Hill	Jun 2010
Providence-Warwick-Pawtucket	Jun 2010
Orlando	Jun 2010
Columbus, OH	Jun 2010
Norfolk-Virginia Beach-Newport News	Sep 2010
Indianapolis	Sep 2010
Austin	Sep 2010
Raleigh-Durham	Sep 2010
Nashville	Sep 2010
Greensboro-Winston Salem-High Point	Dec 2010
West Palm Beach-Boca Raton	Dec 2010
New Orleans	Dec 2010
Jacksonville	Dec 2010
Memphis	Dec 2010
Hartford-New Britain-Middletown	Dec 2010

* Schedules subject to change.

SOURCE: ARBITRON

The PPM – there are three main parts to the PPM—the base station, the PPM itself, and the household hub (see figure). The PPM is a "mobile phone-sized" device occupying approximately four cubic inches and weighing approximately 2.6 ounces. Arbitron survey participants are instructed to wear the PMM from when they get up in the morning until when they go to bed at night, and all household members age 6 and older are given their own PPM. The PPM has an especially sensitive audio transducer designed to “hear” what the participant hears, digital signal processing (DSP) circuitry to analyze the audio it hears for code detection, on-board memory sufficient to store at least one day of event codes, and a rechargeable battery which operates for at least one day on a full charge.

Each PPM is equipped with a motion detector linked to a small green light that is visible to the survey participant. The motion detector is used by Arbitron to track whether the survey participant is carrying the meter throughout the day. As long as the meter is being carried, the motion detector senses the smallest movement and keeps the green light illuminated. An accessory is available for the PPM which allows it to monitor audio being listened to with headphones or “ear buds.” This accessory fits over top of the PPM and has two connectors—one attaches to a cable going to the radio, the other to the headphone or ear bud cable.

At the end of the day, the PPM is placed in the base station which extracts data—both the collected identification codes and data from the motion detector—and recharges the unit. The base station connects wirelessly to the household hub and offers immediate feedback to the survey participant. While each member of the household has their own PPM and base station, only one hub is needed. The hub has a modem (connected to the house phone line) which contacts Arbitron at night and downloads the household data to the Arbitron computers. In addition, the hub sends out a wireless signal to each PPM allowing the PPM to distinguish between in-home and out-of-home listening.

Other interesting information about the PPM system mentioned at the briefing in Columbia included the following:

- Respondents are awarded "points" based on the time that the meter was actively in motion throughout the day. The point total for the day and the total points awarded are displayed on a liquid-crystal-display (LCD) messaging screen in the base station, and are used as an incentive to encourage survey participants to keep the PPM with them at all times;
- The data processing algorithms used by Arbitron are very sophisticated and can determine, for example, if the same person is carrying multiple PPMs;
- It is possible to do “multi-layer” encoding such that commercials and network programming can have unique codes, simultaneous with the station code;
- PPM encoding is by-design always below the peak level in the audio signal and as such will never impact the modulation level of the transmitted radio signal.

Currently, PPM encoders are being installed in the San Francisco, Dallas, Atlanta, Detroit, and Washington/Baltimore markets, and encoding of the complete market is now being accomplished in New York, Chicago, and Los Angeles (in addition to Philadelphia and Houston-Galveston). For additional information on PPM, visit the Arbitron Web page at www.arbitron.com/portable_people_meters/home.htm. Additional technical details on the design of the PPM system are available at www.arbitron.com/portable_people_meters/thesystem_ppm.htm.

2008 NAB Broadcast Engineering Conference Summary of Presentations

Check out the papers that will be presented at the 2008 NAB Broadcast Engineering Conference in Las Vegas, April 12 -17, 2008.

Mobile TV: Opportunity at 100 MPH!

Monday, April 14 • 7:30 a.m. - 8:30 a.m.
Las Vegas Hilton Ballroom A

The Open Mobile Video Coalition (OMVC) invites engineers from television, telcos, cable and OEMs to learn more about breakthroughs and milestones in engineering, consumer interest and testing, as well as new revenue opportunities in the fast approaching locally broadcast Mobile TV world. Join them for breakfast on Monday, April 14 in Ballroom A.