Radio TechCheck | **NAB** NATIONAL ASSOCIATION OF BROADCASTERS

The Weekly NAB Newsletter for Radio Broadcast Engineers

Getting the Most Out of RDS Technology

The Radio Data System (RDS) FM digital subcarrier is an important tool for radio broadcasters that has seen an increase in popularity and usage in recent years. Two papers presented at this year's NAB Broadcast Engineering Conference (BEC, April 9-14, 2011, Las Vegas, NV), excerpted here, provide valuable insight into how broadcast engineers can help their stations get the most out of this technology.

The first paper, "Maximizing the Use of RDS Bandwidth," was authored by Tony Peterle, technical support manager, Worldcast Systems, Inc. Here is a brief overview of Tony's paper:

INTRODUCTION – though it has been in use since the 1980s, the Radio Data System (RDS) has recently seen a surge in interest and deployment by a growing number of broadcasters, particularly in the U.S. There are several reasons for this increase, but much of it can be attributed to the rising popularity of data services such as the broadcast of traffic data to RDS equipped navigation systems, emergency alerting and messaging services, and sending specifically structured song information to receivers that allows the user to "tag" the song for later purchase. This paper gives at least a cursory explanation of the various data services that are most often deployed on an RDS subcarrier. Then it explores the challenges of hosting multiple data services, and some data management and other techniques to help analyze and maximize the performance of the entire RDS system.

WHAT IS RDS? – RDS uses a 57 kHz subcarrier on an FM broadcast signal to deliver low bit-rate (about 1200 bits/sec) data to RDS-equipped radio receivers. The data is transmitted using bi-state phase shift modulation on the subcarrier (which is suppressed). RDS data is arranged in distinct data "groups". Each group is 104 bits in length, and contains binary data divided into 4 "blocks" of 26 bits each. There are 16 different types of RDS data groups, and many of them have been reserved, or assigned, to a particular type of data or data service.

CONTROLLING DELIVERY OF RDS DATA – Managing the RDS bandwidth is really all about controlling the distribution of data across the various different RDS data groups. In most RDS encoders, this management is accomplished by changing the "group sequence." This is literally a sequence of RDS groups that the encoder will follow when broadcasting RDS data. Here is a sample of a typical RDS group sequence (since RDS can only broadcast about 11 groups per second, this sequence represents about three seconds of data): 0A 2A 0A 8A 0A 2A 0A 8A 0A 2A 0A 8A 0A 2A 0A 8A 0A 2A 0A 8A 0A 2A 0A 8A 0A 2A 0A 8A 0A 2A 0A 8A 3A 4A . The number of each group type occurring in this 3 second interval are shown in the graph. Note the presence of

GROUP OCCURRENCE OVER 3 SECOND INTERVAL

8A and 3A groups, indicating that this station is most likely carrying TMC traffic messages. There are also 0A groups for the PS and 2A groups for the RadioText. Also note that not all RDS encoders allow the broadcaster to control the group sequence, but in general the encoders that can handle these types of data broadcasts will have this function.

MEASURING AND MONITORING RDS PERFORMANCE – there are many tools a broadcaster can use to check the signal level, error rate and the data received from a broadcast RDS signal. Poor signal and interference can cause problems with any RDS service, even if the configuration of the encoder is perfect. Once the delivery pathway has been confirmed, the best way to judge RDS performance is from the perspective of a user: is your RT+ receiver decoding the artist and title data to tag the song in a reasonable amount of time? How does the scrolling PS look (on a variety of receivers)? Are traffic incidents, emergency messages and other RDS data being delivered in a timely manner?

The second paper, entitled "Understanding and Optimizing RDS for a New Generation of Receivers," was written by Alan Jurison, a broadcast engineer with Citadel Broadcasting in Syracuse, N.Y. In this paper Alan shares some of his experience from many years of working with RDS:

INTRODUCTION – in the early 2000s, major automobile manufacturers in the U.S. started including RDS as a feature on many of their factory installed radios. In the past few years, manufacturers have improved on these early designs to include multi-colored, larger display touch screens for configuration, GPS navigation and viewing of DVD or other videos. Luckily for radio, they have been able to improve the RDS experience to the end-user with these newer designs. Within the past year and a half, exciting new portable receivers with RDS support have entered the marketplace with the introduction of the Insignia NS-HD01 and NS-HD02, Motorola Droid X, Microsoft Zune HD and Apple's iPod fifth and sixth Generation Nano players. These exciting new receivers are renewing interest among broadcasters with their RDS support.

CONFUSION BETWEEN PS AND RT – Because Program Service (PS) and RadioText (RT) are completely different fields in the RDS Standard, they are treated differently by each receiver. I frequently have talked with someone in radio who gets these two fields confused. I have found this confusion is related to the receiver the person is using to look at RDS. Take the Denon TU-1500RD, a popular 19" rack mount tuner used at radio stations as an inexpensive way to monitor RDS data. The RT display on the Denon does not support a full 64 characters, and so the receiver scrolls the RT on the display to make it fit. Many people have confused this with a dynamic PS's "scrolling" or "framing" effect. While the general listening public does not necessarily need to know what they are looking at (PS or RT), those of us in radio need to pay attention and understand how both fields relate to the end-user experience. I encourage you to try a variety of RDS enabled radios to understand the various user experiences our listeners have depending on the radio they are listening to. It is important to know that there are newer radios that support RT equally, if not better than they do of the PS.

RADIOTEXT+ – if you have been following the industry news in the past two years in the U.S., you may have heard of RadioText + (RT+). RT+ is a data stream you can add to your RDS encoding that classifies various characters within the text you are encoding in your RadioText (RT). Until the RT+ standard was developed, there was no way to know what that data was from a hardware or software standpoint, and this is important for song tagging. RT+ gives us the ability to classify types of information (such as title) and their location within the RT message. Shown in the photos are the fifth (at right) and sixth (at left) generation iPod Nano devices that are using RT+ to parse a song's title/artist/album from the RT data stream. The iPod gives you the ability to "tag" the song for later download by pressing and holding the center button. The next time you connect your Nano to your computer and launch iTunes, you can view your tagged songs and buy them.

DATA AND SONG TIMING – for stations that are running a delay, whether it be for HD Radio signal transmission and/or for profanity, be sure to make adjustments in your RDS display delay. Some hardware and software products on the market have this ability, and it is best that you research this and spend some time "fine tuning" it. If you ignore this, it is possible that a song's data could show up before the song is on the air. If you are going into another song, the next song's data can be displayed for a period of time while the previous song is still playing, which is also an issue.

These papers are included in their entirety in the *2011 NAB Broadcast Engineering Conference Proceedings*, available on-line from the NAB Store. For additional conference information visit the NAB Show web page.

EAS-CAP On-line Town Hall

WHAT: Analyzing the EAS NPRM: A Town Hall Discussion
WHEN: Thursday, June 16, 2011 – 4 - 5 p.m. EST
WHERE: www.EASalert.org

The National Alliance of State Broadcasters Associations (NASBA)–National Association of Broadcasters (NAB) Emergency Alert System (EAS) Committee is pleased to announce the third in a series of webinars on the implementation of the Common Alerting Protocol (CAP).

"Analyzing the EAS NPRM: A Town Hall Discussion" will be presented on Thursday, June 16 at 4 p.m. EST. The one-hour session will feature a summary of the major components of the FCC's EAS Further Notice of Proposed Rulemaking (NPRM), as well as provide an opportunity for participants to ask questions. Information about the upcoming Town Hall will be available soon here. *The NASBA-NAB EAS Committee is coordinating webinars and the Web site to provide resources for broadcasters and our EAS partners in implementing CAP by the September 30, 2011 deadline.*

To participate in this webinar, go to ***www.EASalert.org*** a few minutes before the presentation is scheduled to air. Once on the Web site, click "Go To the Town Hall," where you will be prompted for your name, affiliation and email address. This information will be collected to keep you informed about future events in this series and will not be sold or shared with outside parties.

If you are unable to participate in the live town hall on June 16, it will be archived at www.EASalert.org within 72 hours of the presentation.

FCC to Conduct Training for Consultants on Communications Towers and Environmental/Historic Preservation Compliance

The Federal Communications Commission (FCC) is conducting a session for consultants on Tuesday, June 21, 2011 at their headquarters in Washington, DC on Communications Towers and Environmental/Historic Preservation Compliance. Training will be provided by staff from the FCC, USDA Rural Utilities Service, NTIA, FEMA and the Advisory Council on Historic Preservation.

For additional information contact Steve DelSordo and to register contact James Swartz who are both at the FCC. To attend the session you must preregister.

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The 2011 Radio Show Engineering Program

This year's Radio Show Engineering Program, September 14 – 16 at the Hyatt Regency in Chicago, brings together the three key areas that occupy the broadcast engineer's time. A series of expert tutorials and presentations cover the challenges of creating, operating and maintaining a modern radio facility. New developments in studio design and audio production are explored during Studio/Production Day. Reflecting our evolving business, Transmission/Distribution Day offers a variety of discussions addressing traditional over-the-air and web-based program distribution. Finally, Tower Day focuses on keeping an often overlooked asset – the tower – properly maintained and prepped to become a potential revenue generator.

The Radio Show is jointly produced by NAB and the Radio Advertising Bureau (RAB). The Radio Show will include an enhanced schedule and expanded Radio Show Marketplace featuring exhibitor booths. The show program will also include a complete session schedule

focusing on current issues impacting radio. Early bird registration, a $200 savings over on-site registration, expires on July 3.