Radio TechCheck
The NAB Labs Newsletter for Radio Broadcast Engineers
NAB LABS
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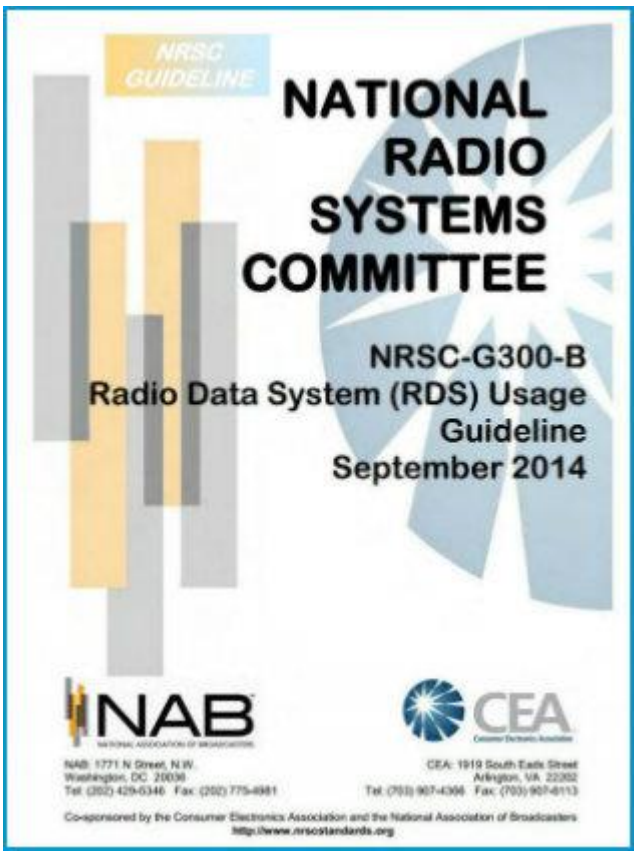
NRSC-G300-B, RDS Usage Guideline, Now Available

The National Radio Systems Committee (NRSC) has released an updated NRSC Guideline that focuses on recommendations for broadcasters and receiver manufacturers in the use of the Radio Data System (RDS) data broadcasting technology. NRSC-G300-B, RDS Usage Guideline was developed within the RDS Usage Working Group (RUWG) of the Radio Broadcasting Data System (RBDS) Subcommittee. The RUWG is chaired by Alan Jurison, Senior Operations Engineer – Engineering and Systems Integration, iHeartMedia, Inc., and the RBDS Subcommittee is chaired by Dan Mansergh, Director of Engineering, KQED Public Radio, San Francisco, Calif.

Approximately seventy pages in length, G300-B includes a new section, 4.6, providing information on establishing adequate RDS encoder security at broadcast facilities. Provided below are some brief excerpts from this Guideline:

Background

The purpose of this Guideline is to provide broadcasters, receiver manufacturers, data service providers and other users with information that will help them make the best use of RDS technology and provide a more useful and consistent RDS experience for consumers. The material which follows was discussed at length over many months in meetings of the NRSC's RBDS Usage Working Group (RUWG) and represents the consensus opinion of that group.



RDS Installation

RDS is a component of FM broadcasting that uses an encoder to create a signal which is combined with other components of the FM baseband including the mono (L+R) and stereo multiplex (L-R) program audio-derived signals. The RDS signal, also called the RDS subcarrier, is a 1,187.5 bits per second (bps) data stream (with approximately 670 bps of usable data) encoded into a 4 kHz-wide suppressed-carrier AM subcarrier centered at 57 kHz.

The hardware that creates the RDS signal is called an RDS encoder. It is installed in the FM program chain either between the audio processing/stereo generator and the (analog) baseband input of an FM exciter, or, the encoder is connected to a separate input on the FM exciter designed for an RDS encoder or for subcarriers. Both these installation methods provide for the feeding of a sample of the 19 kHz pilot to the encoder. The 57 kHz RDS subcarrier frequency is the third harmonic of the 19 kHz pilot and therefore performs in similar fashion as the stereo L-R signal. Receivers should detect the 19 kHz pilot then use multiples of that frequency to demodulate the L-R as well as the RDS subcarrier.

RDS Encoder Security

Stations should immediately review their RDS encoder security at existing installations, and all new RDS encoder installations have security planned in the design phase. The industry has seen small scale security attacks or compromises of RDS encoders which have typically involved the station transmitting false or profane information in the PS or RT fields. There have been several published reports in the media about these occurrences. Private reports indicate there have been unpublished attacks as well.

The documented compromises were of RDS encoders directly attached to the Internet without any protection devices such as a firewall or router. However, the discussion below analyzes many other avenues for compromise.

RDS encoders are designed to be easy to configure and access. How to address these devices is widely known. Instruction manuals for most RDS encoders are available online to assist engineers installing these devices. This same information is available to people who may be looking to compromise an RDS signal.

When considering the security of an RDS encoder, various physical and logical security techniques should be employed. Moreover a multi-layered approach should be considered. Multiple layers can reduce the probabilities of a successful attack. Some items discussed below may work for your organization; some may be prohibitive from an operational or cost standpoint.

Using RDS for Program Associated Data

Program Associated Data (PAD) is a term used to describe data (usually textual) that is associated with an audio program on the radio. PAD can vary depending on the type of material being aired on the radio station. The most common use of PAD currently via RDS is the current song title and artist data. However, there are many other types of PAD that can be encoded via RDS and displayed such as the song's album data, or in the case of non-music related programs, more information about the program. For example, a radio station running a live talk show may include the show's name, topic being discussed, the name of the guests and, perhaps the phone number to call in and participate in the show. The examples above are just some of the current and potential uses of PAD for RDS.

This updated NRSC Guideline is available free-of-charge on the NRSC's website. Additional information about the NRSC, including information on becoming a member, is also available on the website.

NAB Seeking 2015 Technology Innovation Award Nominees

NAB is currently accepting nominations for the 2015 NAB Technology Innovation Awards. First presented at the 2009 NAB Show, NAB presents the award to organizations that bring advanced technology exhibits and demonstrations of significant merit to the NAB Show. The nominated exhibit should present advanced research and development projects in communications technologies that have not yet been commercialized.

Candidates for the Technology Innovation Awards must be organizations who are currently exhibiting at the NAB Show. The size of the organization is not a determining factor. Nominated projects may not be commercial products that have been offered for sale prior to or at the NAB Show. The merit of the technology exhibit is the sole factor to be taken into account. The entry deadline is February 20, 2015. The awards will be presented at the NAB Technology Luncheon on April 15, 2015 at the NAB Show in Las Vegas.

Here is a summary of the award winners from the past two NAB Shows:

2014 Award Recipient: Ericsson Television Ltd.

The 2014 NAB Technology Innovation Award went to Ericsson Television Ltd for its demonstration of a live real-time contribution feed of 4K Ultra High Definition Television coming from Europe directly to the NAB Show exhibit floor. While we've seen beautiful 4K consumer television sets in retail showrooms, they will just be high tech furniture until enough 4K content is widely available. The Ericsson demonstration showed a clear path for broadcasters to overcome the first and most important hurdle — acquisition of high quality and truly immersive live 4K content. This demonstration showed the professional industry that it is possible to start building the ecosystem and a library of Ultra HD content now, as broadcasters consider rolling out commercial 4K services in the coming years.

2013 Award Recipient: Cisco Systems, Inc.

Cisco Systems received the 2013 NAB Technology Innovation Award for its Future of Video concept. Future of Video (formerly called Project Fresco) presents a future of television that breaks out of the "box in the corner of the room," showing how television will harness new display technology and an immersive layout engine to become unobtrusive, frameless, ultra-high definition and ambient. Future of Video demonstrates that television's future is both collective and personal, and exemplifies a new relationship between large screens and companion devices.

Additional information and a nomination form are available on NAB's website. The deadline for nominations is February 20, 2015.

NAB Seeking Engineering Achievement Awards Nominees

NAB is currently accepting nominations for the 2015 NAB Engineering Achievement Awards. Established in 1959, the NAB Engineering Achievement Award is presented each year to an individual for outstanding accomplishments in the broadcast industry. In 1991, NAB began giving awards separately for achievements in radio and television. The award winners will be recognized at the Technology Luncheon at the 2015 NAB Show on April 15 in Las Vegas, Nev.

The nomination form is available on NAB's Engineering Achievement Award website, and the deadline is **January 16, 2015.**

Important Dates and Upcoming Events

2015 NAB Show

April 11 - 16, 2015

Las Vegas, Nev.

Audio Engineering Society (AES) 57th Conference: The Future of Audio Entertainment Technology

March 6 - 8, 2015

Hollywood, Calif.

Hollywood Post Alliance (HPA) Tech Retreat

February 9 - 13, 2015

Indian Wells, Calif.