NAB TV TechCheck

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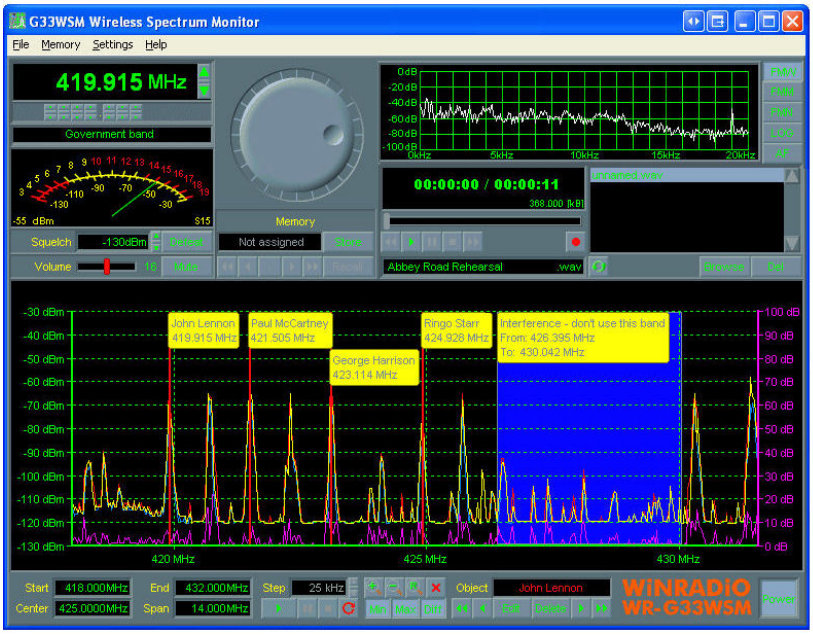
WiNRADiO Programmable Receivers Show Flexibility of Software Defined Radio

Broadcast engineers looking for a new way to monitor the RF spectrum might want to consider a software-defined radio (SDR) from Australian receiver manufacturer WiNRADiO (Oakleigh, Australia, www.winradio.com). The WR-G33WSM Receiver (see photo, MSRP of $999.95), which requires a personal computer for the user interface, can easily be configured for specific tasks using the "RBASIC" application development environment available free-of-charge from WiNRADiO.

An SDR is a radio for which most of the radio signal processing is performed in software, using digital signal processing methods, rather than with traditional discrete hardware components such as resistors, capacitors, diodes, etc. In the WR-G33WSM, the received RF signal is digitized early in the signal processing chain and all further processing, demodulation and decoding of the digitized signal is performed entirely in software. Some of the advantages to this approach include flexibility of demodulation modes (new modes can be added easily by simply upgrading software); improved performance over a conventional receiver since digital techniques make it possible to implement sharper selectivity filters and more accurate (i.e. mathematically precise) demodulators and decoders; and, improved consistency and stability because component tolerances and aging do not play as important a role compared to conventional receivers.

Some of the technical specifications for the WR-G33WSM are provided in the table below. While the WiNRADiO company makes a broad array of programmable receiver devices, this unit was developed especially for sound engineers and performers who work with wireless microphones and other wireless audio devices. Using the WR-G33WSM an engineer can map the radio spectrum environment of a particular location, determine available



Parameter	Value
Receiver type	DDS-based dual-conversion superheterodyne w/ software-defined final IF stage and demod
Frequency range	30 to 1000 MHz
Tuning resolution	1 Hz
Mode	FMN, FMM, FMW
Spurious-free dynamic range	93 dB
Image rejection	60 dB
RSSI accuracy	5 dB
RSSI sensitivity	1 µV
Selectivity	FMN: 12 kHz FMM: 30 kHz FMW: 230 kHz
Sensitivity (12dB SINAD)	0.7 to 2.5 µV
Antenna input	50 ohm (SMA connector)
Output	USB (1.0 and 2.0 compatible)
Dimen. (LxWxH)	6.46" x 3.78" x 1.61"
Weight	16.40 oz

frequencies and then allocate wireless microphones to the available channels. The entire spectrum environment of each venue can be saved and recalled later, to save time during the next visit.

An example of the user interface is shown above (to the right of the specifications) which also illustrates one of the most useful features of the WR-G33WSM, namely the real-time spectrum analyzer (the large graph at bottom) which supports both linear and logarithmic scales and a variable intermediate frequency (IF) filter bandwidth. In the image, cursors and text labels have been added to the display to assist the engineer in remembering which frequencies are assigned to which performers (apparently this particular receiver was taken back in time to a Beatles concert!)

WiNRADiO receivers also support what is called the Extensible Radio Specification (XRS), a standard-based platform for the control of radio devices (receivers or transmitters) by a computer. The XRS standard defines the interface between a radio control program (the "server") and an add-on plug-in software module (the "client"). Over 30 different XRS plug-ins have been developed and are available for download (free-of-charge) from the XRS Web site, xrs.winradio.com, from the following categories:

- Tuning tools and panels
- Memory management
- Scanning and searching
- Spectrum analysis
- Signal strength and channel occupancy logging
- Calibration (including the "Calibrated S-Meter" shown at right)
- Frequency logging
- Antenna switching
- Task scheduling, miscellaneous

RBASIC (mentioned earlier) is also an XRS plug-in which is described in detail (and available for free download) at the Web site www.rbasic.com. With RBASIC, users can create their own applications to control and/or automate every aspect of receiver operation, and can create data files containing receiver-derived data for later use. A host of public-domain RBASIC applications is available, as well.

Sign Up Now for NAB'S Satellite Uplink Operators Training Seminar

September 29 – October 2, 2008

If you weren't able to attend the June NAB Satellite Uplink Operators Training Seminar, you still have one more opportunity this year. The course will be offered September 29 – October 2 at NAB's headquarters in Washington, DC. This four-day course is designed to instruct students in the proper technical and operational

practices that will ensure safe, successful and interference free satellite transmissions.

You can check out a short video piece featuring satellite seminar instructor Sidney Skjei on the NAB365 Thought Leadership Channel at: http://nab365.bdmetrics.com/spc-8-10720/nab365-tv.aspx.

For more information call Cheryl Coleridge at (202) 429-5346 or go to NAB Satellite Uplink Operators Seminar.

ATSC Digital Television Transmission System
8-VSB Fundamentals Seminar
Wednesday, September 24, 2008 – KNME, Albuquerque, N.M.

The 1-day 8-VSB Fundamentals seminar, conducted by Gary Sgrignoli, will help you develop a fundamental understanding of the digital VSB transmission system and its performance attributes as well as current practical application information. The seminar includes an optional site visit to KNME's DTV Tx site on Sandia Crest. For additional information contact the instructor Gary Sgrignoli, Meintel, Sgrignoli & Wallace at 847 259 3352 or Gary.Sgrignoli@IEEE.org or Jim Gale, KNME-DT, 505 277 2049, jgale@knme.org.

The AFD Ready Initiative

AFD Ready is an initiative created by television broadcasters to insure uniform and optimum program delivery of television broadcasts after the analog shutdown on February 17, 2009. Through this initiative, participants will work to increase awareness of AFD and promote its use throughout the television industry.

More information on the initiative including technical information and whitepapers, industry links and a list of AFD Ready ATSC receiver/down-converter devices is now available at www.nab.org/AFDReady.