

Society of Broadcast Engineers Chapter 24 Newsletter

Madison, Wisconsin

March 2009

Next Meeting

Thursday, March 19
DIGITAL BROADCAST SOLUTIONS
&
CHAPTER NOMINATIONS



Megan Bradley of Digital Broadcast will give a presentation of creative, cost effective solutions using computer technology in the broadcast environment designed to overcome the expense and limitations of conventional solutions.

Dutch Treat Dinner 5:30 PM
Perkins Restaurant
1410 Damon Road
Madison, WI
(no reservation - just gather together)

Meeting and Program at 7:00PM
Wisconsin Public Broadcasting
3319 W. Beltline Hwy
Madison, WI

Coming Up

- Tues Apr 14** LED Lighting by ETC and Chapter Elections
- Weds May 13** Linear Acoustics Audio Processing
- Thurs Jun 11** SBE Summer Picnic

TV WHITE SPACES UPDATE

>>> by Tom Smith

On February 17th, when one third of the TV stations were in the progress of shutting off their analog transmitters, the FCC completed the rulemaking process in order to allow unlicensed broadband devices to operate in the TV broadcast bands. In the February 17th issue of the FEDERAL REGISTER (www.gpo.gov), the FCC published the final rules concerning unlicensed operation in the TV broadcast band. Even though the rules were adopted on November 4, 2008, they did not become official until they were published in the FEDERAL REGISTER. The rules officially become effective on March 19, 2009 except for sections 15.713, 15.714, 15.715 and 15.717 which deal with the creation of the user database. These rules involve the collection of data which is subject to information collection and paperwork requirements of the Office of Management and Budget and need their approval. The date when these rules take effect will be announced later. Like the adoption of these rules taking place on Election Day, this notice was published when many of those involved were occupied by other issues, namely the beginning of the final DTV transition. This action occurred under acting FCC Chairman Michael Copps who promised a more open FCC than that of former Chairman Kevin Martin who held the vote on unlicensed use of the TV white spaces on Election Day.

Spaces >>> continued on page 7

A HOMEMADE HIGH-GAIN DTV ANTENNA (for under \$20)

>>> by Tom Weeden, WJ9H

As an amateur radio operator, I've enjoyed building antennas over the years. Recently I've been looking for a design for an easy-to-build, high-performance TV antenna that would provide better results than a typical "rabbit-ears" antenna. While researching homemade TV antennas I came across a YouTube video of someone showing how to make an "HDTV" antenna out of coat hangers. <<http://www.youtube.com/watch?v=EWQhlmJTMzw>> Even though this was entertaining, I was looking for something with a little more science behind it.

My search brought me to the "Gray-Hoverman" TV antenna. This antenna was originally designed by Doyt Hoverman and was first patented in 1959, claiming both VHF and UHF reception. It consisted of a driven array of 56" segments with 7" zigzag sub-elements. With the patents having expired in 1984, some antenna buffs recently began experimenting with the design using antenna modeling

Antenna >>> continued on page 4

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From the Chair

Dennis Baldrige



The SBE serves you!

The SBE provides many services which are designed to enhance the career and personal development of its members. From job searches to insurance and credit cards, the SBE offers members the benefits that one would expect from a mature supporting organization. The SBE's personal resources section at www.sbe.org articulates a number of these opportunities. This month I would like to look at two services specifically designed to advance your career.

In the 2009 economy, some organizations are downsizing while others are adjusting assets. Sometimes either our job is in jeopardy or we realize that it is time to look for a position better suited to our abilities. On the SBE's website, members can locate available broadcast engineering positions throughout the country. In addition, they can also participate in the SBE Resume Bank: an online posting of anonymous resume profiles comprised solely of SBE members for prospective employers to view. This is a great opportunity to detail our personal strengths: the skills that help us do our work well. Martin Luther King, Jr. once said "Whatever your life's work is, do it well. A man should do his job so well that the living, the dead, and the unborn could do it no better." The online Resume Bank is an excellent place to document your abilities and certification.

Access the SBE's member services to enhance your career – they are there to help you achieve your goals.

FCC RUSHES MORE DTV NIGHTLITE RULES

>>> by Tom Smith

The FCC had no sooner issued the DTV Nightlight rules as required by Congress, and then the FCC issued more rules concerning nightlight operation. These rules were in response to Congress voting and President Obama signing the extension to June 12th for the DTV transition deadline. While the bill was being enacted, the FCC had stations file if they still planned to shutdown analog operations on February 17th or if they wished shutdown on June 12th with the option of shutting off analog sometime in between. The FCC must have been surprised that nearly 500 stations still wanted to shut down on February 17th, and in many cases, all the stations in a market wanted to do so. On February 11th, the FCC issued rules concerning nightlight operation that required at least one station in a market to provide nightlight service which seemed to be a given from the earlier rulemaking, but they then added an extra requirement that the nightlight station air newscasts and any live emergency information besides DTV transition information on the analog channel for a minimum of 60 days. In most markets, there were stations that were willing to air DTV transition information for up to 30 days under the original rules, but few stations were expecting to have to air the additional newscasts or go for 60 days.

The FCC also required that at least one station provide a walk-in service center to deal with viewers' questions and that there be a local number for viewers to call with questions. The FCC issued a number of notices that the DTV Transition delay law had taken effect; set a deadline on February 13th for stations to reply by Sunday, February 15th if they wished to reconsider shutting down on February

Nightlight >>> continued on page 3



Amateur Radio News

compiled by Tom Weeden, WJ9H

• Even though the mandatory analog TV shutdown date has been delayed by four months, ham radio operators are still assisting the FCC and their communities by providing technical support to those who need assistance. American Radio Relay League Media and Public Relations Manager Allen Pitts, W1AGP, said he has been getting e-mails and phone calls from Amateur Radio operators concerning the digital TV conversion. "People are asking what's happening with the DTV conversion — especially now that it's been delayed — and wondering what we as hams can do to help," he said. "There has been considerable confusion concerning the extension of the date, but the role of Amateur Radio is simply to be helpful to the people in our communities."

Late last year, the FCC requested assistance from the ARRL in providing educational support to local communities regarding the digital TV conversion. "I really appreciate the willingness of the ARRL to actively participate in helping Americans with the transition to DTV and your helpful suggestions," said George Dillon, FCC Deputy Bureau Chief for Field Operations (now retired). "Our goal is to engage the amateur community on a cooperative basis to help with the DTV outreach and to educate consumers."

• A rare winter tornado struck Oklahoma around dinner time on Tuesday, February 10. According to various news reports, Oklahoma officials credited Amateur Radio

operators with spotting the tornadoes and relaying the information to the National Weather Service. ARRL Oklahoma Section Emergency Coordinator Charles Goodson, KC5UEG, told the ARRL that the Southern Oklahoma ARES group and other Amateur Radio operators from the Ardmore area served as SKYWARN storm spotters. "It was amateur operators who had the first visual contact with the tornadoes. They started reporting the tornado to Neil Mayo, KC5AMX, the Emergency Coordinator for Murray County and our Net control for severe weather events; he in turn reports to the National Weather Service in Norman via Amateur Radio."

On the other side of the world in the Australian state of Victoria, Amateur Radio operators were activated to provide communications links into towns that have had their normal communications destroyed by the bushfires that have decimated the state. Members of the Wireless Institute Civil Emergency Network in Victoria were activated on February 8, with members being deployed to areas with loss of power and other facilities.

Excerpts from the American Radio Relay League's arrl.org web site



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Nightlight >>> continued on page 2

17th. The action the FCC took was on February 20th where they issued rules: setting the new dates for DTV nightlight operation after the June 12th shutdown; extending licensed periods for analog TV stations' construction periods for the new wireless licenses in the 700 MHz band; and other housekeeping rules the delay required. Finally the FCC set a March 17th deadline for stations to notify the FCC if they wished to shutdown earlier the June 12th. Those stations meeting that deadline would shutdown on April 19th.

The FCC has issued another order on March 3rd that waived the 100-day countdown to June 12th. This was to reduce confusion to viewers. Other notice requirements are still in effect.

The Commission has been issuing new rules and other releases concerning the transition a couple of times a week. Along with all the notices being issued, there have been very short comment periods on new rules that the Commission has proposed. For new proposals made late on Friday, comments are due on the following Monday.

Keeping ahead of the new rules, and getting filings in, nearly requires stations to check the FCC website a number of times a day. E-mails and faxes from stations' attorneys have become nearly continuous.

All of these notices are listed in the headlines section of the FCC homepage.

From FCC Releases (www.fcc.gov)

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Antenna >>> continued from page 1

software, something that Mr. Hoverman didn't have available to him at the time. The optimized antenna design, now dubbed the "Gray-Hoverman," has been released under the GNU General Public License as published by the Free Software Foundation. Details can be found at <<http://www.digitalhome.ca/ota/superantenna/index.htm>>

The Gray-Hoverman consists of two zigzag conductors suspended 4 inches in front of a 30 by 40 inch reflector which can either be solid or several individual rods. The feed point is at the center of the array, where a balun is soldered to the conductors. Measured performance of the basic version of this antenna shows a gain of 10 dB at channel 14 to nearly 15 dB at channel 51. While it's not designed for VHF, it does provide some gain at channel 11 for Madison viewers of WMSN-DT.

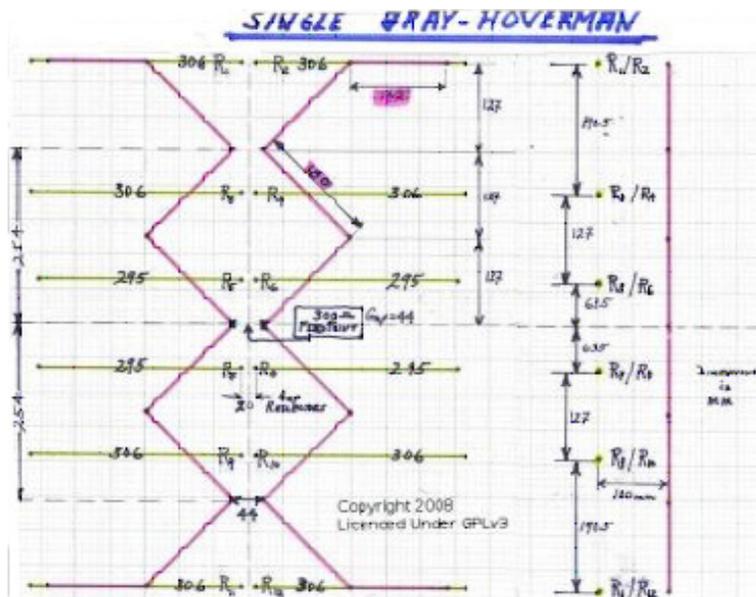


Figure 1. Basic Gray-Hoverman antenna dimensions

My goal in constructing this antenna was to use readily-available materials and simple tools. A trip to Menards provided most of the materials, and a balun from Ace Hardware that I had purchased earlier rounded out the supplies. Total cost: just under 20 bucks.

I used a 2 by 4 foot piece of 1/4" peg board as the antenna frame. (In looking back, a better choice would have been plywood or particle board, as it's hard to staple to peg board.) The antenna supports are 7/8" hardwood dowels cut into 4 inch lengths. The dowels could be drilled to allow the wires to pass through, but I used 1/2" screw

eyes in the ends of the dowels.

For the reflector material, I used aluminum screen material cut to size and stapled to the frame. The screen is in two sections, split down the middle and separated by 1/2". (This is supposed to improve performance by about a half dB over a solid screen reflector.) I drilled pilot holes into the frame corresponding to the corners of the zigzag conductors where the dowels were screwed to the frame. The screw eyes were inserted into the other ends of the dowels, and two 55 inch lengths of #12 stranded wire were passed through the screw eyes and bent into shape to form the antenna. At the center posts of the antenna, I stripped away the wire insulation and soldered the twin-lead ends of a standard TV balun to the antenna wires. I used cable ties to provide strain relief to the balun by tying it down to the nearby dowels.



Figure 2. Tom's Gray-Hoverman antenna shown on WMTV in a demonstration of various antennas on February 16, 2009 about two hours before the analog shutdown.

To measure performance of this particular antenna, I used a Tektronix 2710 spectrum analyzer connected to the antenna through 50 feet of RG-56 coax. I measured the signal levels of each of the six Madison DTV stations from my home, which is 2 miles from WMTV/WBUW and 3 miles from the other stations. I used the analyzer's averaging function to take 50 samples of each station. Then I substituted a typical "rabbit-ears-and-loop" Channel Master indoor antenna in the same physical location and repeated the measurements. Almost every station had amplitude variations across their 6 MHz channel, so I took a simple average of the minimum and maximum received voltage levels and converted the average signals to decibels relative to 1 microvolt. **Antenna >>> continued on page 5**

Antenna >>> continued from page 4

DTV Station and Channel	“Rabbit Ears” Signal, dBuV	Gray-Hoverman Signal, dBuV	Net Improvement
WMSN-DT 11	58	57	-1 dB
WMTV-DT 19	38	47	+9 dB
WHA-DT 20	51	56	+5 dB
WKOW-DT 26	49	59	+10 dB
WBUW-DT 32	46	64	+18 dB
WISC-DT 50	47	59	+12 dB

Figure 3. Antenna measurements

As a quick subjective test, I took the homemade antenna to my parents’ house in Brodhead, WI, 30-32 miles south of the Madison towers. With the antenna on the second floor of the house, a Zenith converter box had solid reception of all six Madison DTV stations, including VHF WMSN-DT.

If more gain is needed at VHF, it should be possible to add a folded dipole in parallel to the feed point,

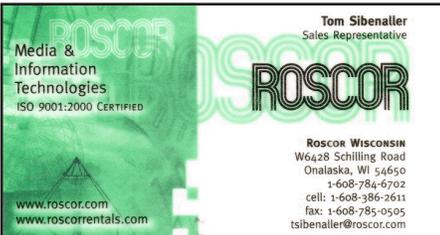
14” on each side. I haven’t tested this to see if it would affect UHF performance.

This antenna is currently hanging on a wall in my basement and would be a good candidate for attic installation. It’s easy to construct and provides excellent results. See the <digitalhome.ca> web site listed above for other versions of the design, including one meant for outdoor use made on a PVC frame with a chicken wire reflector.

Certification Exam Session Dates

For more information about SBE Certification, contact Jim Hermanson, Chapter 24 Certification Chair, or contact Megan Clappe, Certification Director at the SBE National Office at (317) 846-9000, or mclappe@sbe.org.

Exam Dates	Location Application	Application Deadline
June 5-15, 2009	Local Chapters	April 17, 2009
August 7-17, 2009	Local Chapters	June 5, 2009
Nov. 6-16, 2009	Local Chapters	September 18, 2009
February 5-15, 2010	Local Chapters	December 31, 2009



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Sales Representative

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Thanks to Leonard Charles for maintaining the Chapter 24 web site and to Steve Paugh for mailing the meeting reminder postcards.



Meeting Minutes

from the February 2009 Business Meeting

Chapters 24 of the Society of Broadcast Engineers meet on February 19, 2009 at the studios of WSUM Radio. There were 13 members present of which 11 were certified. There were also 3 guests present.

Chapter chairman Dennis Baldrige call the meeting to order and asked that any visitors to the meeting to introduce themselves. Kevin Trueblood of Midwest Family Broadcasting introduced himself. A request for a motion to accept the minutes from the January meeting was made and a motion to accept the minutes was made by Steve Paugh and seconded by Kevin Ruppert. The Chairman then gave the Treasurer's report on the current bank balance for Treasurer Leslie Franzen.

Frequency Coordinator Tom Smith gave an update on the current status of the TV white space and wireless mike rules.

Certification Chairman Jim Hermanson reported the one certification exam had been given in the last round of exams and that the exams for 2009 would be given from June 6-15 with application deadline of April 17th, August 7-17

with application deadline of June 5th and November 6-16 with application deadline of September 18th.

Program Chair Steve Paugh reported that next month's program would be by Digital Technology and that he was trying to get ETC to give a program on a new product in April.

Mike Norton reported for Sustaining membership Chair Fred Sperry the there were two recent renewals, Sound Devices and Wisconsin Public Television. The current number of sustaining members is 22.

There was no National report or any old or new business. Nominations Chair Steve Paugh asked for nominations for the upcoming elections and reported that Bill Hamilton of Wisconsin Eye had volunteered to run for Vice-Chairman. Steve Paugh motioned for the meeting to be adjourned with a second by Jim Hermanson.

Matt Rockwell of WSUM then gave a tour of the new WSUM Studios.

*Respectfully submitted by
Tom Smith, Secretary*



CHAPTER 24 SUSTAINING MEMBERS

Recent Renewals:

Broadcast Richardson

Ross Video

Wisconsin Public Television

Thanks to all our Sustaining Members

Alpha Video

Belden-Electronics Division

Belden- Networking Division

Clark Wire and Cable

Entercom Madison

Full Compass Systems

Heartland Video Systems

Madison Video Repair

maney-logic

Midwest Media Group

Resonant Results, Ltd.

Roscor Wisconsin

Scharch Electronics

Sound Devices, LLC

Token Creek Productions

WISC-DT 3

WKOW-DT 27

WMSN-DT 47

WMTV-DT 15



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Spaces >>> continued from page 1

In other news concerning TV white spaces, the White Space Coalition consisting of founders Google, Microsoft, Dell, HP, Intel, and Neustar as well as Philips, Samsung, Earthlink and others announced in early February that they were seeking to develop the database that the FCC rules require. They formed a group called White Space Database Group which included Comsearch as well as the members of the White Space Coalition. According to Broadcast Engineering (<http://broadcastengineering.com/audio/tech-company-consortium-create-white-spaces-database-0222>) they would like to start the development of the protocols and technical formats for an open and non-exclusive database. A company called Spectrum Bridge (www.spectrumbridge.com) which operates an online spectrum exchange has launched a web site called ShowMyWhiteSpace.com which has a search engine that shows occupied and open TV channels.

The database searches for channels that are either open or occupied based on address or geographic coordinates. The results show a list of each channel with an "X" if occupied or a checkmark if opened. The results do not show any restrictions that the rules require on the use of the open channels.

According to TV Technology (<http://www.tvtechnology.com/article/74898>), Spectrum Bridge was founded two years ago by former executives of Motorola, Lucent and Nortel. They help various wireless providers find open spectrum to lease under FCC rules that allow for leasing of unused licensed spectrum to others. The website for spectrum trading is SpecEx.com.

Besides providing the database, the ShowMyWhiteSpace.com site provides descriptions of uses of white spaces, comments from the White Space Coalition and potential pitfalls of using unlicensed spectrum. They are pitching themselves to

the FCC to take on the database management duties for white space users according to Broadcasting and Cable (http://www.broadcastingcable.com/article/174561-White_Spaces_Locator_Site_Launches.php).

A number of SBE frequency coordinators have used ShowMyWhiteSpace.com to search their local market and found numerous errors. The results showed many channels to be open when they were in use. ShowMyWhiteSpace.com is seeking wireless microphone information to add to their database. It looks like they are trying to position themselves to become the whitespace database provider.

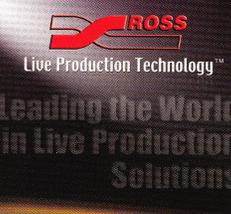
On March 2nd, Broadcasting and Cable (http://www.broadcastingcable.com/article/189362-Broadcasters_Sue_FCC_Over_White_Spaces_Decision.php) reported on their website that the National Association of Broadcasters (NAB) and the Association of Maximum Service Television (MSTV) filed a lawsuit with the District of Columbia Circuit Court to have the FCC set aside the decision that authorized the use of unlicensed broadband devices in the TV bands. Then on March 3rd, Broadcasting and Cable (http://www.broadcastingcable.com/article/189418-ESPN_Sports_Leagues_Theater_Owners_Take_FCC_To_Court_Over_White_Spaces_.php) reported that ESPN, Broadway producers and theater owners and the major sports leagues, including the NFL, NBA, Major League Baseball, NCAA and News Corp., filed suit with the Second Circuit Court of Appeals in New York.

The White Space Alliance issued a statement saying, "The Broadcasters continued opposition to this revolutionary technology is disappointing, but certainly not surprising. For decades, their policy has been to stifle innovation at all costs and ask questions later and this is no different."

April '09 Chapter 24 newsletter Copy deadline: Wednesday, April 1 paul.stoffel@wpt.org



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Notice of Elections

By Steve Paugh, Nominations Chair

In April we will hold elections for Chapter 24 offices of Chair, Vice-Chair, Secretary and Treasurer for the 2009-2010 term. All interested members of Chapter 24 who are current in their dues are eligible to run for elected office. The nominations committee is now accepting nominations for all four offices. As of this date, the following members have been nominated for the following offices.

- Chair- Open for Nominations
- Vice Chair- Bill Hamilton
- Treasurer- Open for Nominations
- Secretary- Open for Nominations

Call For Nominations

During the March 19th meeting, the nominations committee will solicit the members present for additional nominations. If you would like to run for an office, or know someone who wishes to run, please bring it to the attention of the nominations committee. All nominees are requested to submit a short biography for publishing with the ballot. The nominations committee consists of Steve Paugh (Chair), Mike Kulis and Leonard Charles.

Appointed Officers

The appointed offices do not fall under the jurisdiction of the nominations committee and are appointed by the Chair of Chapter 24. Traditionally, the existing appointed officers continue for another term automatically. If you are a current appointed officer and would like to step down, please contact the current Chair Dennis Baldrige. If you would like to serve as an appointed officer please make your desire known to the Chair.

The current appointed offices are Program Committee Chair- Steve Paugh, Program Committee Members- Fred Sperry & Steve Zimmerman, Newsletter Editor- Paul Stoffel, Membership- Paul Stoffel, Sustaining Membership- Fred Sperry, Special Events- VACANT, Certification and Education- Jim Hermanson, Frequency Coordination- Tom Smith and National Liaison- Leonard Charles.

Ballots

The election ballot will be mailed in early April and will be published in the April on-line newsletter. You can either use the mailed ballot or print the on-line ballot and mail it in to the Nominations Chair. The deadline for nominations and the submission of biographies will be March 28th, 2009. At this time we have no procedure for on-line voting. Hopefully by the 2010-2011 election cycle we will be able to offer on-line voting.

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