

Society of Broadcast Engineers Chapter 24 Newsletter

January 2009

Madison, Wisconsin



In this Issue

From The Chair.....	2
Clear QAM Tuning.....	4
Amatuer Radio News.....	6
White Spaces Impact.....	8
FCC Rulemakings.....	9



Next Meeting

Tuesday, January 13

Microphone Techniques at Full Compass Systems

Kevin Peckham of Full Compass Systems will give us an overview of microphone transducer types, explain operating principles, polar patterns and design parameters. This will lead up to a demonstration and discussion of the very latest microphone technology, the Neumann Solution D digital AES microphone. Kevin will also have some interesting old antiques and unusual modern models on display, many of them operational and connected for evaluation.

Dutch Treat Dinner 5:30 PM
Hubbard Avenue Diner
7445 Hubbard Ave
Middleton, WI

(no reservation - just gather together)

Meeting and Program at 7:00PM
(use the front door entrance)
Full Compass Systems 
8001 Terrace Ave
Middleton, WI



Coming Up

Wednesday, Feb. 18: Tour of new WSUM Facilities and Nominations
Thursday, March 19: Open and Nominations

PSC adds overlay area codes in 715 and 920

>>> by Neal McLain

The Wisconsin Public Service Commission has announced that it plans to add two area codes in Wisconsin. Both will be overlays: 274 will overlay 920 and 534 will overlay 715. After the overlays are implemented, ten-digit dialing will be required in those geographic areas.

According to the Commission's press release, this action was taken because 715 and 920 are projected to run out of available phone numbers near the end of 2011. [1]

Why Overlays?

Why did the PSC opt for overlays instead of splits?

This issue inevitably comes up in area-code relief proceedings. The arguments are always the same:

- A split means that half the phone numbers in the affected area get a new area code. Businesses don't like this because they have to change their phone numbers on everything from letterheads and business cards to trucks, buildings, websites, and billboards. Companies that do a lot of business with out-of-town customers lose business because their old customers can't reach them.
- An overlay means 10-digit dialing for local calls. Theoretically, it's possible to retain 7-digit dialing within each separate area code, even in an overlay situation, but customers would still have to dial ten digits to reach numbers in the other area code. And that would

area codes >>> continued on page 3

FCC CHAIRMAN CRITICIZED IN REPORT

>>> by Tom Smith

In a majority staff report of the House of Representatives Committee on Energy and Commerce entitled "Deception and Distrust: The Federal Communications Commission under Chairman Kevin J. Martin", The FCC Chairman was severely criticized for his management of the FCC and how various actions by the Commission were handled. The Report was issued early in December. The investigation was started by the Committee because of "allegations that the Chairman had abused FCC procedures by manipulation or suppressing reports, data and information." These allegations came from current and past FCC employees, telecommunication industry representatives, and other FCC Commissioners and had been reported in the press. The allegations came to a head with the Commission's Consideration of the 13th Annual Video Competition Report in November of 2007. On December 3 of that year, Committee Chair John Dingell sent a letter to Martin noting that there was a breakdown of an open and transparent regulatory process at the FCC and asking Martin a set of question in order for the FCC's process to be fair, open and transparent. Martin sent an undated letter back saying that he would adhere to the Administrative Procedure Act (APA) and would make all but one of the management improvements requested by Chairman

report >>> continued on page 7



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From the Chair

Dennis Baldrige



Electronic-only version of the newsletter coming next month!

Most people are in favor of progress; it's the changes they don't like.

Starting in February, the SBE Chapter 24 newsletter will be available only as a PDF file, for viewing or printing from the chapter's web site. An e-mail with the URL link will be sent to chapter members. A printed copy will no longer be mailed to members. The decision for this change in delivery method was made by the chapter's executive committee.

For years, willing members and helpers have quietly worked behind the scenes printing, collating and preparing the newsletter for mailing. They have done this without remuneration and for the most part without adequate appreciation. It required hours of time and personal sacrifice. To all of those who have helped over the years, we say a big thank you for their service to Madison's SBE Chapter 24.

Oliver Wendell Holmes once said "The great thing in the world is not so much where we stand, as in what direction we are moving." In an effort to be progressive while maintaining our quality newsletter, we are switching to an electronic version of the newsletter. Members will only receive the newsletter link, not the actual PDF file.

This will save the chapter money on printing, mailing and related costs, as well as time. As society moves toward a paperless medium, SBE Chapter 24 wishes to do our part as well; being good stewards of our environment.

The electronic newsletter will be in color and no longer limited to eight pages. There will be embedded links to web pages and e-mail addresses for Sustaining members. The PDF file will be published the 6th of each month. Newsletter articles are due the 1st of each month.

One key requirement for this change is to make sure that we have each member's current E-mail address. Leonard Charles is putting together the list of E-mail addresses to be used. If you did not receive an E-mail link to the newsletter this month, then please forward your contact information to him at lcharles@wisctv.com

Progress is the goal and change is necessary. Thank you for your understanding and support on this needed change.



Meeting Minutes

from December 2008 meeting

Chapter 24 of the Society of Broadcast Engineers meet on December 11, 2008 at Fitzgerald's Supper Club for its annual Holiday Dinner. There were ten members present of which seven were certified. There were four guests present also. No business was conducted. The program for the evening was that of enjoyable conversation and dinner.

Respectfully submitted by Tom Smith, Secretary

area codes >>> continued from cover

put cell phone companies at a competitive disadvantage because they're the ones most likely to need new numbers. In its 1996 Ameritech decision, the FCC established a "dialing parity" rule: all numbers within an overlay must be dialable with the same dialing plan. And that means everybody has to dial ten digits for local calls. [2]

The overlay-vs.-split argument has played out twice before in Wisconsin:

- In 1996, the PSC split 414. The northern portion of 414 was assigned 920, and the southern portion retained 414. The PSC's decision was a unanimous 3-0, although one commissioner, Joseph P. Mettner, originally favored an overlay. According to a Communications Analyst with the Commission, "The vote ended up being unanimous. There were some questions by Commissioner Mettner regarding some other possible area code relief. However, after a brief discussion with the other two Commissioners, he changed his position in support of the staff draft recommendation." [3]
- In 1999, the PSC split 414 again. The split line more or less followed the Milwaukee County line, with Milwaukee retaining 414, and the rest of 414 getting 262. Once again, Commissioner Mettner favored an overlay, and this time he voted for it. But the other two members of the Commission voted for a split in 2-1 final vote.

In the years since 1999, overlays have become widespread, and now cover over half of the population of the United States. Numerous large metropolitan areas now have ten-digit dialing: Atlanta, Boston, Charlotte, Cleveland, Dallas, Denver, Fort Lauderdale, Fort Worth, Houston, Miami, Montreal, New York City, Northern New Jersey (NYC Suburbs) Northern Virginia (DC suburbs), Orlando, Ottawa, Philadelphia, Portland, Toledo, Toronto. Maryland has

had four area codes in two geographic areas since 1997, and ten-digit dialing has been a statewide requirement since that date. Puerto Rico and the Dominican Republic each has two overlay area codes, with ten-digit dialing throughout their territories.

In view of the growing acceptance of overlays, it's no surprise that PSC voted unanimously in favor of overlays in 715 and 920.

Why 274 and 534?

Why were those particular codes — 274 and 534 — selected?

First, some administrative background. Area codes within the North American Numbering Plan (NANP) are assigned by the North American Numbering Plan Administration (NANPA), a division of NeuStar, Inc. The NANP includes United States, Canada, U.S. territories in the Pacific, and a hodgepodge of U.S. territories, British territories, and sovereign nations in the Atlantic and Caribbean.

State, provincial, and territorial governments within the NANP determine how area codes are utilized. They determine area code boundaries within their jurisdictions, and the manner of usage (split or overlay).

Three rules apply to the assignment of area codes:

Rule 1: The code must be in standard Geographic Area Code format. See sidebar, page 4.

Rule 2: An area code can be used only once. A new area code can't conflict with any other area code anywhere in the NANP.

Rule 3: An area code and a central office code within the area code can't (or shouldn't) be the same. This rule prohibits such combinations as 715-715 or 920-920 (although it didn't stop the Illinois Commerce Commission from assigning 847-847). This rule means that the new area code must be selected from the list of presently-unused central office codes. That list is likely to be fairly short: if an area code needs relief, it's already running out of central office codes.

If we apply all of these constraints

to any given area-code relief situation, we end up with few usable possibilities. In order to avoid ending up with zero possibilities at some future date, NANPA has established "Geographic Relief Codes" -- two or three codes held in reserve for each existing area code for possible future use. To ensure that these codes remain available, they are never assigned as central office codes within the existing area code boundaries.

Area codes 274 and 534 were probably assigned years ago, and have been held in reserve for use as relief codes for 920 and 715.

So where did all the numbers go?

In theory, each area code has capacity for almost 8,000,000 telephone numbers, far in excess of the entire population of Wisconsin. So why is there a shortage of telephone numbers in any area code?

We've discussed the obvious reasons in this Newsletter before: rising population; rising residential penetration levels; the increased use of centrex and centrex-like telephone systems by businesses. And, of course, the endless proliferation of gadgets: alarm systems, pagers, cell phones, ATMs, fax machines, computer modems, voice mail boxes, credit-card verification boxes, self-serve gas pumps. [4]

But there's a more fundamental reason: the proliferation of competitive telephone companies demanding new central office codes.

To understand the significance of this reason, we first have to understand the format of NANP telephone numbers. Every NANP telephone number is composed of three parts:

NPA-NXX-XXXX

where:

- NPA is the "Numbering Plan Area" (that's the official name for an area code).
- NXX is the Central Office Code. N can be any digit 2-9; X can be any digit 0-9. An NXX code can be anything from 200

Clear QAM Tuning Broadcast Channels on Cable

>>> by Vicki Kipp

Have you ever wondered where Charter is modulating your broadcast analog and DTV channels within their signal? If so, you may find the HD Home Run Channel List tool provided by SiliconDust USA, inc. useful. The Channel Lineup includes broadcast, community access, music, and typical basic cable channels.

You can get a listing from all DTV 8VSB over-the-air and unencrypted analog and DTV signals available in QAM256 through the cable provider in a given postal code of the United States or Canada. Next to the channel listing are three thumbnail “snapshots” of the video from that channel taken at different times.

How to look up the Clear QAM Lineup:

1. Access Internet page <http://www.silicondust.com/>
2. Click on the “Resources” tab
3. Click on “TV Channels”
4. Enter a zip code.
5. Click the “Search” button

According to SiliconDust.com, the following broadcast channels can be tuned on Charter Cable in the Madison-area as of December 2008:

Channel	Program	Call Sign
83	10	WHA analog
83	11	WBUW analog
84	9	WISC analog
84	10	WKOW analog
84	11	WMSN analog
85	8	MyMad
85	9	WMTV analog
85	11	WPT2
87	4	WisEye
104	1	WMSN-DT
104	6	WMTV-DT
106	1	WKOW-DT
106	3	WISC-DT
111*	4	WMTV-DT2
113	4	WMTV-DT2
114	2	WHA-DT
114	4	WHA-WI Channel
114	6	WHA-Create

*The Channel 111-Program 4 listing for WMTV-DT2 appears erroneous. 111-4 seems to be a Music Choice channel.

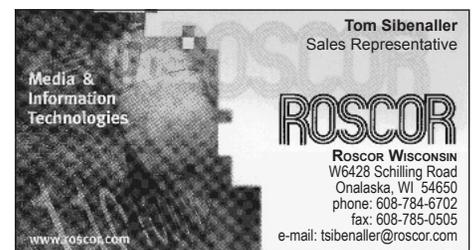
As a courtesy to their HD HomeRun tuner users, SiliconDust maintains a channel lineup server and shares that information. The tuned channel list and snapshots from each channel are updated regularly. Any channel listed in the lineup has been tuned by an HD HomeRun unit in within the past four days.

SiliconDust receives the channel lineup information from HD HomeRun product users. If enabled, the HD HomeRun will connect to the SiliconDust lineup server whenever a channel scan is conducted to identify and provide snapshots from the channels tuned. The HD HomeRun product will scan channels when it is idle. HDHomeRun users benefit from being connected to the SiliconDust channel lineup server because their tuner then automatically links the tuned channels to the program guide data for those channels. Channel information submitted does not include any data about which channels are watched. Tuning information is submitted as a hash, a mathematical function which converts a large, varied sample of data into a single condensed data unit which is useful for making comparisons.

Silicon Dust USA, Inc sells several tuning products including the HD HomeRun, the DBV HomeRun, and network cards for TiVo Series 1. The HD HomeRun networked box contains two digital tuners that decode ATSC, 64-QAM, and 256-QAM. It works with applications such as Windows Media Center, Elgato EyeTV DVR for Mac, MythTV DVR for Linux, TS-Reader MPEG-2 transport stream analyzer (Figure 1, on page 5), VLC multiplatform media viewer, and DVRs for Window such as SnapStream BeyondTV, SageTV, MediaPortal, and GB-PVR.

Sources:

- ☞ <http://www.silicondust.com/>
- ☞ TS Reader software <http://www.tsreader.com/legacy/>
- ☞ Wikipedia definitions of hash and clear QAM.



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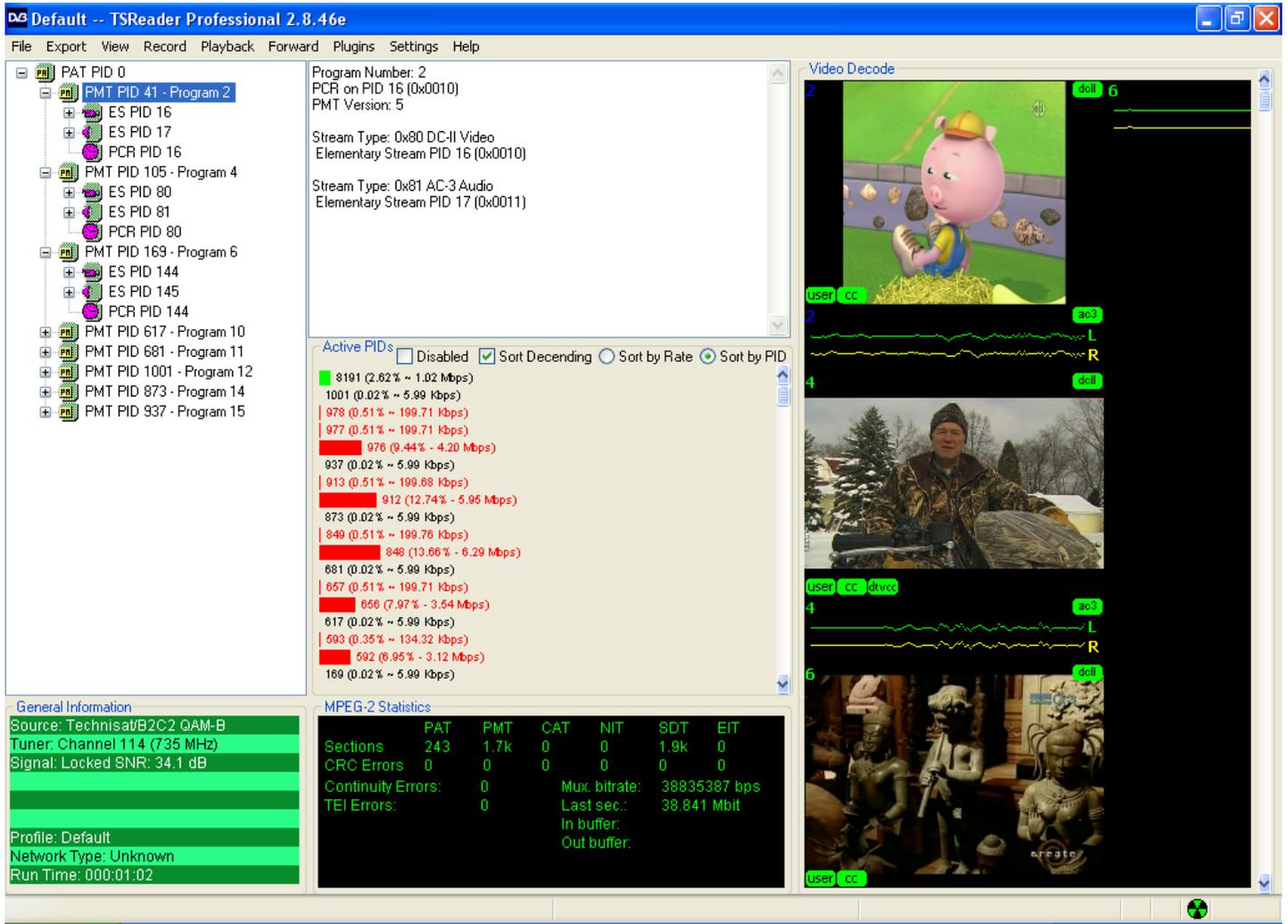


Figure 1: The TSReader transport stream analyzer application yields more detailed information about QAM-B or 8VSB signals. WPT's DTV multicast is shown here.

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

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Thanks to WISC-TV for maintaining the Web server for the Chapter 24 web site and to WIBA-AM/FM for providing copying and folding facilities for the newsletter.



Amateur Radio News

compiled by Tom Weeden, WJ9H

Amateur radio operators who keep an eye on the ionosphere and solar weather have recently noted several items that are out of the ordinary.

First, 2008 was a year of very low solar activity. More than 40 percent of the weeks in 2008 had zero sunspots. Hams are reporting that quiet solar conditions are providing low-noise long distance contacts on the lower HF bands.

Second, observations made by NASA instruments onboard an Air Force satellite have shown that the boundary between the Earth's upper atmosphere and space has moved to extraordinarily low altitudes. These observations were made by the Coupled Ion Neutral Dynamics Investigation (CINDI) instrument suite, which was launched aboard the U.S. Air Force's Communication/Navigation Outage Forecast System (C/NOFS) satellite on April 16, 2008. Presumably a lower ionosphere would decrease the skip distance on HF communications.

Third, NASA's five THEMIS spacecraft have discovered a breach in Earth's magnetic field ten times larger than anything previously thought to exist. Solar wind can flow in through the opening to "load up" the magnetosphere for powerful geomagnetic storms. But the breach itself is not the biggest surprise. Researchers are even more amazed at the strange and unexpected way it forms, overturning long-held ideas

of space physics. THEMIS project scientist David Sibeck of the Goddard Space Flight Center says, "this could result in stronger geomagnetic storms than we have seen in many years."

In December the American Radio Relay League received a request from the FCC asking that ARRL members provide technical educational assistance to their communities concerning the FCC-mandated digital television (DTV) conversion scheduled for February 17, 2009.

According to ARRL Media and Public Relations Manager Allen Pitts, WIAGP, Amateur Radio clubs across the country are being asked to develop and implement plans to provide information throughout January and February about the DTV conversion in their areas. The FCC is leaving it up to the clubs to decide how to do this, as local groups understand the communities in ways that the FCC does not. Each community is a little different, Pitts said, so plans carried out by the clubs will vary from community to community.

Pitts stressed that hams should not make "house calls," sell any equipment or do actual installations; the request is only to distribute technical information and FCC materials. He commented: "As we all know, some folks just never get the message until too late. Materials for presentations, education and many other activities are available online

at <http://www.dtv.gov/outreach.html>.

Beginning early January, FCC staff will contact Section Managers and leaders of interested clubs and, where possible, arrange to meet to share even more information, audio, visual and printed materials, as well as training aids, with the clubs involved in this effort. We know the time is short, but your aid in this now will be appreciated."

Pitts advises interested groups to keep in mind that they are to provide technical educational help only: "At no time should the hams enter someone else's home or install equipment. They should not broker or sell conversion boxes in any way. Clubs can provide such things as a call-in telephone number for technical help, make presentations at meetings, do demonstrations at malls or give talks to other groups -- whatever works in their community."

Madison's Four Lakes Amateur Radio Club (FLARC) provided a DTV information display at the University of Wisconsin Space Place during the recent *US Bank Eve* activities on December 31st.

Excerpts from the American Radio Relay League's arrl.org web site, <http://www.sciencedaily.com>, and <http://www.science.nasa.gov/> headlines

report >>> continued from front page

Dingell. The request that Martin refused was the publishing of proposed rules before they were to be presented at a Commission meeting. The APA does not require they be published, but it does show a lack of transparency which set off more warning flags about Martin's management. Chairman Martin's reply was followed up by a letter in January of 2008 and another in March signed by Committee leaders of both parties expressing their further concerns.

The final report was issued by the Democratic members of the Committee and reported the following:

• There were instances in which the Chairman manipulated, withheld, or suppressed data, reports and information.

This included Martin asking that reports from staff be rewritten to reflect positively on his position on an issue even when the facts differed from his opinion.

• Important Commission Matters have not been handled in an open and transparent matter, thereby raising suspicions both inside and outside of the Commission that some parties and issues are not being treated fairly.

This would include the failure of the proposed rules being published and commented upon before Commission action and the withholding of reports such as those withheld in the broadcast localism inquiry.

• The Commission has failed to carry out some responsibilities.

This issue relates to the Telecommunications Relay Service in which consumers have been overcharged by \$100 million because of FCC inaction.

• Chairman Martin's heavy hand, opaque and non-collegial management style has created distrust, suspicion and turmoil among the five Commissioners.

Commissioners have not been provided reports before meetings and have been denied access to Commission employees to ask for information concerning issues before them

• Commission staff has not been effectively managed.

Senior employees have been demoted or reassigned causing loses of expertise in some issues before the Commission and delays in acting upon them. Personal changes affected all levels of Commission employees. The Chairman has the authority to make personal changes and normally will make changes to bureau and department heads, but these appointment changes normally does not affect lower levels of employees. Many of these reassignments were because of opposition to the Chairman's positions. The Chairman also was accused of micro-managing the agency. All personal issues along with many other day to day issues had to go through his office were they would sometime sit for long periods of time. Also any communications between various personal, bureaus and other government agencies had to get his approval. The report alleges that both the FCC Inspector Generals office and the Public Safety and Homeland Security Bureau were mismanaged.

In the report, there were twelve specific cases addressed, three pertained to personnel issues, five to Telco issues including E-911 and four that affected cable and broadcasters. They included the 13th Annual Video Competition Report, the FCC's A La Carte Cable report which addressed cable and satellite providers allowing consumers to purchase only a few channels that they may want instead of a full package of channels, Broadband over Power Lines and the withholding of the approval of the Liberty Media purchase of DirecTV because of an issue with the White House over delivery of some local broadcast channels. That issue was settled by normal action by DirecTV before the vote came up before the Commission.

The report may be moot from the fact that with a new Administration in the White House and a new Chair of the Energy and Commerce Committee, a new FCC Chairman will be appointed by President Elect Obama and the Committee may have other issues higher on their agenda. The report's real effect could be

in petitions for reconsideration of some of the Commission's recent actions or potential lawsuits concerning any of those recent actions.

The root cause of these problems in the FCC may go back to the Reagan Administration when the number of FCC Commissioners was reduced from seven to five and the terms were also reduced from seven to five years. This allows the President to normally appoint all of the Commissioners within a four year term when the normal resignations are considered. Under the old seven Commissioner system, there was a couple of holdovers that would provide for more diverse debate and may have developed strong ties with staff. It seems that in recent years, the Chairman has gained more power and all he has to do is get two other Commissioners to vote with him instead of three Commissioners. By keeping the other two Commissioners in your party on your side, you can move your agenda ahead without much opposition.

From Energy and Commerce Committee Report <http://energycommerce.house.gov/images/stories/Documents/PDF/Newsroom/fcc%20majority%20staff%20report%20081209.pdf>

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WHITE SPACES IMPACT

>>> by Tom Smith

With the FCC's approval of white space broadband devices, I thought that it would be interesting to see how they would impact their use of the television spectrum. Looking at two markets, Milwaukee and Madison, a search for usable channels was made. Only fixed white space devices were analyzed as those are the ones that have the most value for the white space device proponents. Also, only the UHF Band was looked at as that is the band most desired for white space device usage.

First, what is a usable channel for a white space device? A fixed white space device must operate on a channel that is not either co-channel or adjacent channel to a full power or low power TV station or a TV translator or in the path of a video STL or relay that operates within the UHF TV band. For co-channel operation a white space device must operate at a specific distance beyond 41 dBu contour of a TV transmitter. That point is 3.75 miles for an antenna of 3 meters or less, 5 miles for an antenna of 3-10 meters and 9 miles for 10-30 meters. Adjacent channel operation is allowed at less than 100 yards past the 41 dBu contour for operation under 10 meters and just under a half mile for operation from 10-30 meters. No fixed white space device may operate with an antenna over 30 meters in height. Most will operate in the three to 30 meter heights because of the size of the UHF antennas. They will be too large for lamp and power poles and would need to be roof-top or tower mounted. Finally no white space device may operate on channel 36, 37 or 38 in order to protect radio astronomy and medical monitors. Portable/personal devices may operate on channels 21-51 only making those channels more valuable for WiMax/WI-Fi operation of personal computers. Operation on VHF channel and UHF channel 14-20 are for fixed to fixed operation only.

Looking at the Madison market, post transition channels 19, 20, 26, 32, 49 and 50 are used by full power stations with channels 23 and 38 used by low-

power stations. Channels 43 and 44 with transmitters south of Mayville are also included as unusable channels. The following channels are adjacent to the local channels and cannot be used: 18, 21, 22, 24, 25, 27, 31, 33, 39, 42, 45, 48 and 51. That leaves the following channels available: 14, 15, 16, 17, 28, 29, 31, 34, 35, 40, 41, 46 and 47. In Fitchburg, McFarland, Verona and parts of south Madison channels 16 and 41 cannot be used as they are Rockford stations that have their 41 dBu contour ending at the south edge of Fitchburg. Add 5-9 miles and you are at the Beltline highway or even just south of the University. That would give 11 to 13 channels available for white space devices. Add another station, either full power or low power and two or three open channels would disappear.

The second market looked at was Milwaukee which also includes the Kenosha, Racine and Mayville transmitters. There are full power stations on channels 18, 22, 25, 28, 33, 34, 35, 40, 43, 44, 46, and 48. There are low power stations on 17, 20, 31, 47, and 49. Adjacent channels that cannot be used include: 16, 19, 21, 22, 24, 25, 27, 30, 32, 39, 41, 42, 45, and 50, which leaves 14, 15, 26, and 51.

Finally just looking at the full power stations that cover Watertown which is halfway between Madison and Milwaukee

to see what is available for white space device use... from Milwaukee there is 18, 22, 25, 28, 33, 34, 35, 40, 46, and 48; from Madison 19, 20, 26, 32, 49, and 50; and from Mayville 43 and 44. The unusable adjacent channels are: 17, 21, 23, 24, 27, 29, 31, 39, 41, 42, 45, 47, and 51, which leaves 15, 16 and 30 open.

What does this little survey prove?

The impact on broadcasters may not be very severe. In larger markets, there may not be enough spectrum to provide a service from multiple locations or from multiple providers, between markets, there may be even less and in smaller TV markets there may be more of a potential for problems as they may be the easiest to place white space devices, but may also be the least profitable. The smaller markets may also have the highest need for the spectrum for broadband use. In the markets with even more stations than Milwaukee, there will be less spectrum available, and on the East Coast, there will be little to none available. It will be hard to build a service with one 6 MHz channel and a bunch of 4 watt transmitters. White spaces may not be the spectrum bonanza that its proponents think it is. Depending on system design, there may be the need to use several channels to avoid interference or support multiple operators.

Chart of UHF Spectrum Usage

Madison Market

(14), (15), **16**, (17), 18, **19**, **20**, 21, 22, 23, 24, 25, **26**, 27, (28), (29), (30), 31, **32**, 33, (34), (35), 36, 37, **38**, 39, (40), **41**, (42), **43**, **44**, 45, (46), (47), 48, **49**, **50**, 51

Milwaukee Market

(14), (15), 16, *17*, **18**, 19, 20, 21, **22**, 23, 24, **25**, 26, 27, **28**, 29, (30), *31*, 32, **33**, **34**, **35**, 36, 37, 38, 39, **40**, 41, 42, **43**, **44**, 45, **46**, 47, **48**, 49, 50, 51

Watertown

14, 15, 16, 17, **18**, **19**, **20**, 21, **22**, 23, 24, **25**, **26**, 27, **28**, 29, 30, 31, **32**, **33**, **34**, 36, 37, 38, 39, **40**, 41, 42, **43**, **44**, 45, **46**, 47, **48**, **49**, **50**, 51

Channels in **bold** are full power stations, channels in *italics* are low-power stations and channels in parentheses are usable white space channels. Channels in regular type are adjacent channels. Channels 36, 37 and 38 are reserved for medical and radio astronomy use and are underlined.



PROPOSED RULEMAKINGS

MB Docket No. 08-255; FCC 08-281 Implementation of Short-term Analog Flash and Emergency Readiness Act; Establishment of DTV Transition “Analog Nightlight” Program

In response to a bill passed by Congress and signed by President Bush, the FCC has started a short rulemaking period to implement a program to allow some analog TV transmitters to remain on the air for 30 days past the February 17th shutdown date. These transmitters would not provide regular TV programming but would provide DTV transition information and public safety information. The final day of operation would be at 11:59:59pm on March 19th.

Stations would be required to provide DTV transition information in both English and Spanish, provide EAS notification and would be able to provide emergency information relating to weather, and other emergency events by crawl, and live or taped reports. Closed captioning would still be required during these emergency announcements.

Stations that will not be eligible:

- those that are outside the channel 2-51 core
- **those that** would cause interference to a DTV station (short-spaced)
- those that are being flash cut from another DTV channel to its old analog channel.

The FCC listed stations that are eligible to provide nightlight service. These stations should not create potential interference problems. The list was very short. In Wisconsin, the stations listed were KBJR-TV (6) in Duluth, WBAY-TV (2) and WIBW-TV (14) in Green Bay, WISC-TV (3) in Madison, WVCY-TV

(30) in Milwaukee and WBIJ-TV (4) in Crandon. The reason for the low number of stations is that the FCC set mileage separation standards that substantially exceed those in their regular table of required spacing.

Other stations wishing to apply to provide nightlight service are able, if they can meet interference requirements. Stations that meet the old analog to analog spacings or the DTV to analog spacings should have a good chance on meeting the interference requirements.

The Report and Order was adopted and released on December 24th and was published in the FEDERAL REGISTER on December 31st. Comments were due on January 5th and replies due on January 8th. By law, the rules will take effect on January 15th.

MB Docket No. 08-253; FCC 08-278 Replacement Digital Television Translator Service

The Commission is proposing to create a new DTV translator service for full power DTV stations. This service would allow a full power DTV station to make-up for losses from their previous analog service area due to differences from their DTV coverage due to band changes or power limitations. They could not be used to extend coverage beyond the analog coverage area. These translators would have priority over other translator or LPTV applications in the area except for displacement applications for existing translators and LPTV stations. These translators can operate on channels 2-51 and also 52-59 if no channel is available between channels 2-51. The translators license would be tied to the full power station the same as any other broadcast auxiliary license and would be transferred or renewed with that full power station's license only. These translators would be licensed on a secondary basis to any other full power DTV station or land mobile operations in the channel 14-20 band and the channel 52-59 band. The Commission did ask for comment on

the impact of these translators to future White Space Broadband Devices.

The Commission announced it will start taking interim applications for these translators, per the Notice of Proposed Rulemaking, January 2nd, as published in the FEDERAL REGISTER. The notice was adopted on December 22nd and released on December 23rd. Comments are due on January 12th and replies due on January 22nd.

From FCC Releases www.fcc.gov and the FEDERAL REGISTER www.gpo.gov

FCC ISSUES ANALOG- DTV COVERAGE MAPS

As part of the things learned in the Wilmington DTV transition, one was that there were some major differences in coverage between the analog and DTV facilities. To help stations determine and correct potential coverage issues, the FCC has released two reports showing the differences on coverage and the population gains or losses caused by the transition to DTV.

The FCC found that 89% of the stations will gain coverage population while 11% of the stations will have coverage and population losses.

The first report is for stations that have gains and shows a map for each station having both the analog and DTV contours overlaid along with footnotes.

The second report is for stations that have lost coverage and population. This report has two maps per station. The first map shows the changed contours between the analog and DTV facilities and the changes in coverage and population patterns. The second map shows the stations' complete coverage gains and losses including those inside the service area due to the cliff effect. The maps may be of marginal help as they show the contours based on the stations' power and antenna height above average terrain and do not correct for differences in terrain in different directions. The coverage maps are the basic circle coverage maps.

The first report can be found at www.fcc.gov/dtv/markets and the second report at www.fcc.gov/dtv/markets/report2.html

area codes >>> continued from page 3

to 999 except for N11 combinations like 411 and 911. Each NPA contains 792 NXX codes.

- XXXX is the line code; it can be anything from 0000 to 9999.

The NPA-NXX combination identifies a specific central office owned by a specific company. Thus, for example, 608-271 identifies the AT&T Black Oak office in Madison; 608-272 identifies the CenturyTel office in Cataract; and 608-279 identifies a U.S. Cellular office in Madison. These combinations are important for two reasons: call routing and billing.

Every one of those NPA-NXX combinations contains 10,000 possible telephone numbers. Until recently, there was no way to break up a 10,000-number block into smaller chunks, so all 10,000 numbers were assigned to a specific central office, no matter how many numbers it actually needed. CenturyTel's office in Cataract is a case in point: it uses, at most, 1000 numbers (608-272-3XXX), yet it ties up the entire 608-272 number block.

Now what happens when another company comes along and wants to provide a competitive telephone service? For call-routing and billing purposes, it needs a unique identifier. During the late 1990s, when it was not possible to break up 10,000-number blocks, every new entrant got a separate NXX code. Even though it may not have needed anywhere near 10,000 numbers, it still got 10,000 because that's the way the system worked.

And that's the problem: area codes don't run out of telephone numbers; they run out of NXX codes.

During the tech boom of the late 1990s, dozens of new companies entered the telephone business. Every one of them -- every paging company, every cellular company, every cable TV company, every wireline carrier -- needed a separate NXX code before it could provide service to even one customer.

Internet Service Providers got into the act too. ISPs needed large blocks of numbers for their dialup customers, and many of them found it less costly (and less hassle) to get their own NXX codes, rather than dealing with local telephone companies. So each ISP

area codes >>> continued on page 11

Geographic Area Codes

The following table specifies the format of geographic area codes in the North American Numbering Plan:

Digit	Allowable Range	Restrictions
1st	2-9	First digit cannot be 0 or 1.
2nd	0-8	Second digit cannot be 9.
3rd	0-9	Third digit cannot be the same as the second digit.

At first glance, it might appear that the maximum number of geographic area codes is $8 \times 9 \times 10 = 720$.

However, the third digit can't be the same as the second digit, so we have to subtract 72 combinations. This restriction prohibits the use of "service access codes" as geographic area codes. This category includes N00 codes (500, 600, 700, 800, 900), N11 codes (211, 311, etc.), and 8YY codes (855, 866, 877, 888).

We also have to exclude combinations that are reserved for other purposes: 370-379, 456, 521-529, 555, 710, 880-889, 950, 960-969. We end up with about 600 combinations that can be used as geographic area codes. Of this total, over 300 are already in service, or reserved for future assignment.

A list of all currently-assigned codes is available at Linc Madison's website. This list also includes codes that were assigned but never implemented.
<<http://www.lincmad.com/locator.html>>.

- 608-205-2XXX Charter Fiberlink
- 608-205-4XXX Level 3 Communications
- 608-205-5XXX Level 3 Communications
- 608-205-6XXX Charter Fiberlink
- 608-205-7XXX US Cellular
- 608-205-8XXX Bandwidth Communications

Table 1. Thousands-block NXX code assignments in 608-205 in Stoughton, Wisconsin, November 2008. Source: Timmins Technologies. [7]



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area codes >>> continued from page 8

got 10,000 numbers -- a large block indeed, but far larger than any but the largest ISPs actually needed.

All this caused a big demand for new NXX codes. As area codes ran out of NXX codes, new area codes were needed. During the six-year period 1995-2000, 134 new area codes went into service. [5]

But after 2000, the demand for new area codes began to drop. The FCC instituted "Number Conservation," a requirement that, whenever possible, NXX codes were to be broken into 1000-number blocks. Since that requirement took effect, most new code assignments have been made in 1000-number blocks. A case in point: 608-205 in Stoughton (see Table 1, page 10).

But the demand for new area codes never completely went away. Cell phone companies continued to grow rapidly, enticing new customers with fancier phones (Blackberries iPhones) and extra features (cameras, texting, GPS). Cable TV companies began to make significant inroads in the residential market.

Meanwhile, the old wireline and paging companies were losing customers, but their lost customers were scattered randomly throughout their databases. So while the cell phone and cable TV companies kept needing new NXX codes, the wireline and paging companies couldn't release their old ones.

New area codes were inevitable. During the eight-year period 2001-2008, about 51 new area codes have been added, and another dozen or so (including 274 and 534) have been announced for future implementation. [6] As of December 1, 2008, there were approximately 328 area codes in service in the North American Numbering Plan. (The exact number is difficult to pin down because the various national, state, provincial, and territorial regulatory agencies keep revising their plans.)

The Wisconsin PSC expects that 534 will be implemented 2010, and 274 will be implemented in 2011.

About the author: Neal McLain is a retired cable television engineer now living in Texas. During the 1970s and 1980s, he served as Director of Engineering and Manager of Technical

Services for Madison's cable television company Complete Channel TV, the forerunner of Charter Communications. He was an active member of Chapter 24 for many years, and served as chapter secretary for three years. He has written numerous articles for this Newsletter. Officially, he is now a member of Houston's Chapter 105, but he still regards Chapter 24 as his "home chapter." He can be contacted at texasableguy@gmail.com.

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