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Ham Radio Spectrum Above 50 MHz The Rocky Road Ahead

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A Little About Who I am

- ➔ Licensed Ham since 1962
- ➔ Founding board member of Northeast FM Repeater Assn.
 - 1968 First East Coast Repeater system Boston to DC
- ➔ ARES EC Butler County, Ohio (1973-76)
- ➔ ARES EC Santa Cruz County, CA 1992-1996
- ➔ Santa Barbara Amateur Radio Club Board of Director
- ➔ Member: ARRL, QCWA, APCO, NSA, RCA
- ➔ Other
 - Member and Fellow: Radio Club of America
 - Awarded Sarnoff Citation by RCA in 2010 for my contributions to RF
 - Co-Chair APCO Broadband Committee
 - Member of Public Safety Advisory Council to FCC's ERIC (NSA)
 - Consultant to Public Safety Alliance, Public Safety Spectrum Trust

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The View of Spectrum From Washington

It is all about Broadband

Executive Branch and the FCC's View

➔ Broadband is the future

- Channelized narrowband communications is no longer important
- Commercial operators need more broadband spectrum
- FCC has pledged to “find” 500 MHz of additional broadband spectrum
 - 300 MHz within 5 years
 - 200 MHz additional years 5-10
 - Some of this will be auctioned, some unlicensed
 - Will work with NTIA who controls over 60% of all available spectrum
- FCC report shows that US will be “short” 92 MHz of broadband spectrum by 2013 and 250 MHz of spectrum by 2015

➔ THEY DO NOT UNDERSTAND

- The broadband systems CANNOT provide the same types of voice services as are available on channelized spectrum today
- They do not understand the value of simplex/tactical/talk-around
- They are even pushing Public Safety to give up narrowband

Who is at Risk to Lose Spectrum?

→ TV Broadcasters

- Pushing TV stations below Channel 30 opens up over 180 MHz of prime spectrum

→ NITA

- Government Spectrum which is little used and/or could be repurposed

→ Any group which has spectrum above 50 MHz

- However, the value of spectrum below 500 MHz for broadband is questionable
- Device sizes
- Antenna Size
- Battery life
- Building systems which can be integrated with other systems

→ HOWEVER

- Those is DC do NOT understand this: Spectrum is Spectrum

Hams are the Most vulnerable today

- ➔ HAM bands offer access to contiguous spectrum
 - Other services in the 150-174 and 450-470 are intermingled with each other
 - Public Safety, Business and Industrial, paging, family radio services
 - This spectrum will be harder to repurpose because of the varied usage
- ➔ HAM spectrum offers:
 - Contiguous spectrum
 - 146-148 MHz and 420-450 MHz
 - Hams are secondary users in the 420-450 MHz band which is controlled by NTIA
 - We have already seen some ham 440 repeaters shut down or forced to operate at greatly reduced power
 - Relocating hams is EASIER and costs less than relocating business, public safety, or Federal users
- ➔ These are hard facts to accept BUT we must be prepared

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**H.R. 607 : Broadband for First Responders
Act of 2011
The First Threat to 420-440 MHz**

The Bill Calls for:

- ➔ Section 207 of the Bill:
- ➔ REQUIRE MIGRATION BY PUBLIC SAFETY ENTITIES.—Not later than 8 years after the date of enactment of the bill:
 - enactment of the Act, each **public safety entities shall end** their use of radio spectrum above 420 megahertz and below 512 megahertz and begin to use alternative radio spectrum licensed to public safety services in the 700 megahertz and 800 megahertz bands.
 - IN GENERAL.—Not later than 6 years after the date of enactment of this Act, the Federal Communications Commission, in consultation with the Secretary, the Assistant Secretary, and **Federal, State and local public safety agencies, shall issue a report, detailing the plan for public safety entities to end their use of radio spectrum above 170 megahertz and below 512 megahertz** and move all use to the radio spectrum licensed to public safety services, in the 700 megahertz and 800 megahertz bands.

More from H.R. 607

- ➔ **AUCTION.**—Not later than 10 years after the date of enactment of this Act, the paired electromagnetic spectrum bands of 420–440 megahertz and 450–470 megahertz recovered as a result of the report and order required under subsection (c) shall be auctioned off by the Federal Communications Commission through a system of competitive bidding meeting the requirements of section 309 of the Communications Act of 1934.

Why is This in the Bill

- ➔ The Staff of Representative King need to get the bill SCORED by the House prior to Introduction
- ➔ Scoring requires an off-set for the loss of auction revenue lost by re-allocating the D block to Public Safety
- ➔ When the draft of the bill was first viewed by us:
 - It called for all spectrum above 144 MHz and below 512 MHz on which public safety operated to be vacated in 8 years
 - We had 15 minutes to make changes to the bill before it was released
 - The new wording was MINE—and MINE alone and was done:
 - Because this part of the bill is for scoring purposes
 - It will not live past the first hearing
 - A give back was required to get the scoring
 - The staffers do not understand that the 450-470 public safety channels are intermingled with business and other Land Mobile Radio Channels
 - The other two paragraphs basically preclude this from happening

What are the Implications?

- ➔ This is the first, of many, attempts which will be made to get this spectrum for broadband use
 - It makes no sense but then those in DC with broadband fever don't understand the differences between the location of the spectrum and its suitability for commercial broadband usage
- ➔ Even if the NTIA fights to retain this spectrum we should be prepared for other government users to be moved into this spectrum over time
 - They will be relocated from other portions of the spectrum which will be made use of for commercial broadband
- ➔ Having contiguous spectrum puts the ham community in jeopardy going forward
 - We don't have the clout that an NAB or even Public Safety has!
- ➔ We must continue to fight for our spectrum but also be realistic about our chances of retaining it

Public Safety Communications

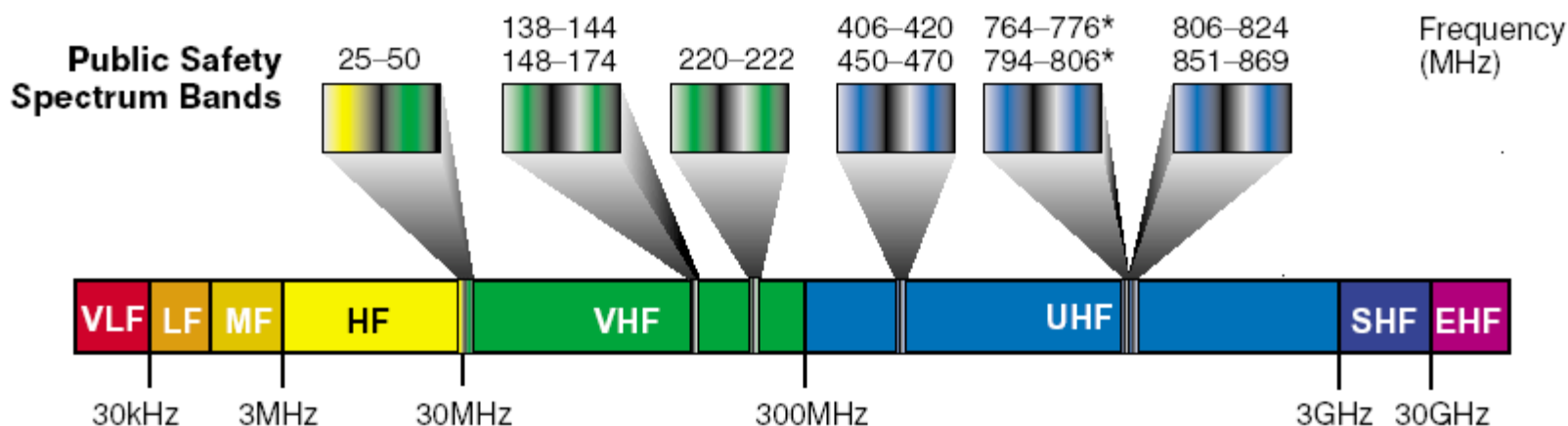
What Started all of this?



Public Safety Spectrum

- ➔ Today Public Safety Operates on narrowband, voice and slow speed data channels in multiple portions of the spectrum
 - This spectrum was allocated by the FCC during the past 30 years
 - As new technologies became available public safety got a LITTLE spectrum for voice use in a higher portion of the spectrum
 - Today's PS Voice systems:
 - 30-50 MHz intermingled with other services
 - 150-174 MHz intermingled with other services
 - 220-222 MHz ONLY in Northern NY because of conflict with Canada
 - 450-470 MHz again intermingled with other services
 - 470-512 MHz Major cities only, not the same in each City-empty TV channels
 - 764-776 paired with 794-806 Includes nationwide interoperability channels
 - 806-824 paired with 851-869 Includes nationwide interoperability channels
 - 4.9 GHZ (just below 5 GHz Wi-Fi band) uses Wi-Fi short range broadband
 - No one portion of this spectrum is large enough to accommodate all needed mission critical voice communications systems

Public Safety Voice and Low Power Data



The bands assigned to public safety are spread across the spectrum, creating difficulties for interagency communications.

In addition Public Safety has 50 MHz of Wi-Fi type spectrum in the 4.9 GHz band. This is useful only for short range or point-to-point communications.

Used primarily for camera back-haul and on the scene communications

Aircraft are not permitted to make use of this spectrum

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Interoperability: Why is in important

- ➔ Today's public safety agencies cannot talk between themselves
 - This causes delays, mis-understandings, loss of additional life and property
 - Was brought to national attention by:
 - Oklahoma City Bombing
 - 9/11 Tragedy
 - Katrina and other major storms
 - Western Wild-Fires every year
 - Has been an issue for over 30 years
- ➔ Only way to partially solve it is to equip vehicles with two or more LMR radios
 - Cost per vehicle run in excess of \$10K
 - Even then if only works for a specific region of the Country
- ➔ Everyone of us carries more capable devices than public safety has (this includes criminals!)

Typical Police Vehicles Today



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So Why Can't Public Safety

- ➔ Simply use commercial networks?
- ➔ Some agencies do but there are issues:
 - During times of major incidents the networks are over crowded with citizens and the press, public safety has not priority access
 - Commercial voice services cannot provide the type of mission-critical voice services required
 - There is not enough bandwidth available during major incidents
- ➔ Commercial networks are not hardened to public safety standards
- ➔ Commercial networks do not provide enough in-building connectivity
- ➔ Public Safety needs control of their own network
- ➔ Commercial networks will not/cannot provide pre-emptive priority because the need to serve all of their customers

We Have ONE Chance to Rectify This!

- ➔ Public Safety has been allocated 10 MHz of spectrum (5X5) in the 700 MHz band for a nationwide-interoperable nationwide broadband network
- ➔ 700 MHz auction included bids for the “D block” I partnership with public safety a public/private partnership was envisioned
 - There were NO bidders for the D block because of the mission critical nature of the network build-out and many other reasons
- ➔ FCC has now recommended that the D block be auctioned with NO requirements to partner with public safety
 - They say that D block winners will “want” to work with public safety BUT there are no rules to mandate that
- ➔ The 10 MHz of spectrum is NOT enough for public safety
 - FCC say priority access will provide commercial network spectrum however, networks say their business model does not provide them with the flexibility to offer priority—especially pre-emptive to public safety

The Public Safety Community

- ➔ Has gone to congress to ask them to re-allocate the D block to public safety
- ➔ The president and executive branch support this PLUS money to fund the building of the network
- ➔ There are several bills pending in both the House and the Senate to re-allocate the D block to public safety
- ➔ Supporting public safety:
 - AT&T Wireless
 - Verizon Wireless
- ➔ Opposed (what the D block auctioned)
 - T-Mobile
 - Sprint
 - Rural Cellular Association (RCA)
- ➔ Public Safety NEEDS this spectrum

New Upper 700 MHz Band Plan - Adopted by FCC on July 31, 2007



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