

## 800 MHz Made Simple

by: Robert Gurss, Partner, Shook Hardy & Bacon LLP Washington, DC

Perhaps you or others in your agency have heard about "800 MHz interference," "800 MHz re-banding" or maybe the "Nextel problem," and are trying to determine if and how and why you might be affected. If so, you are not alone, as there may be as many as 2,000 public safety licensees who are susceptible to interference and/or may need to shift frequencies as part of a comprehensive proposal to mitigate those interference problems. The following is intended as a brief, basic primer on these critical issues.

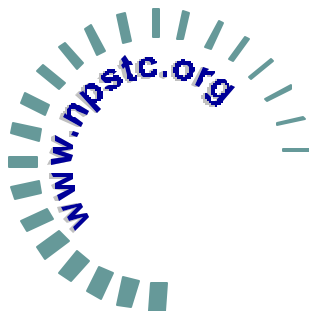
The 800 MHz band is where many new public safety radio systems have been built over the past 15 years, in many cases

as wide-area, multi-agency systems. Other users of the 800 MHz band include business, industrial and land transportation ("BILT") private radio licensees. They operate with system designs similar to public safety operations, i.e., with relatively few, high elevation sites covering a wide area. However, interspersed among channels assigned to public safety and private wireless operations are virtually all of the channels used by Nextel for its nationwide commercial service. Nextel operates with a "cellular architecture," using large numbers of very low elevation sites to provide blanket coverage for its customers. Other cellular systems (e.g., AT&T Wireless, Cingular, Verizon,

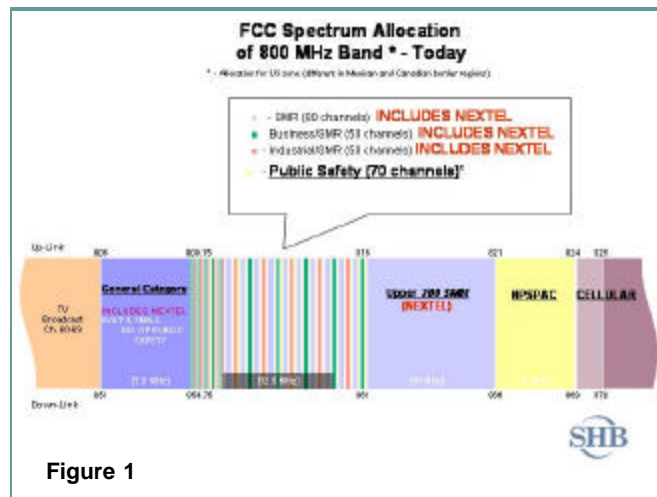
T-Mobile, and Sprint) also operate at the very high end of the 800 MHz band.

The 800 MHz interference problem is a product of this mixture of high-site public safety and private wireless systems with low-site cellular systems operating in the same portion of the 800 MHz band. The most common interference problem occurs when a portable public safety radio is used relatively far from its transmitter site, but very close to a low-elevation cell site. Depending upon the combination of frequencies in use, the public safety portable will be

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## Canadian 700 MHz Harmonization, Canadian DTV Transition and Recent Events

by: Sean O'Hara, Research and Communications Engineer, Syracuse Research Corporation

Representatives from NPSTC, NTIA and others attended the Canadian National Public Safety Radio Conference in February of this year. This invitation-only conference sponsored by the Radio Advisory Board of Canada (RABC) was intended to focus Canadian public safety on defining their spectrum requirements, and to highlight the need for future spectrum planning. Throughout the conference, Industry Canada (IC) pressed the Canadian Public Safety community to define and document their spectrum requirements, so that they would have political leverage to try to meet these needs - including those relating to 700 MHz harmonization with the US. The RABC are now leading the requirement definition effort, using the PSWAC report as a starting point.

It was clear that getting Toronto, Ottawa, Quebec, and Montreal involved with the 700 MHz lobbying is critical, as they would be the primary 700 MHz users, would most immediately reap the

benefits of built-in interoperability and wideband data, and are currently experiencing spectrum shortages at 800 MHz. However, they were poorly represented at this conference. NPSTC and IACP can facilitate the involvement of these cities, and planning in this area is currently ongoing within NPSTC.

From post-conference discussions with IC it was determined that the Public Safety 700 MHz Allocation process was continuing to move forward, with another public solicitation for comment due in the Fall of 2002.

According to IC, there will be some 700 MHz spectrum in the hands of Public Safety by 2003. It was also clear that this process would unfortunately lag the Canadian DTV Transition Policy Framework proceedings. Meetings with the FCC's International Bureau in March of this year failed to garner any new information related to either of these issues.

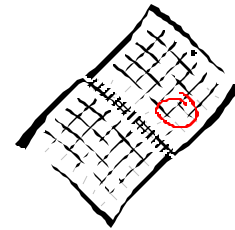
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Thirty seven (37) 700 MHz planning regions have taken advantage of the Regional Planning Committee Support Funding Program to date. All Regional Planning Committees that have accepted the support funding are responsible for reporting the status of funds and expenditures annually until the funds are depleted. RPC Chairpersons should review the provisions of their committee's funding guidelines, verify the anniversary date of the funding and prepare and submit the necessary report(s). Annual reports are due (or past due) for several Regional Planning Committees. If you have concerns about your responsibility for this reporting, need the form or have any other questions concerning the Regional Planning Committee Support Funding Program, please contact David Funk, in the NPSTC Support Office. ■

## Important Dates

January 28-30 January 25-28	<b>CAPRAD Training</b> [Session 5] SDR Forum (32nd General Meeting)	Denver, CO San Jose, CA
February 10-12 <b>February 19</b> February 20-21 February 25-27	APCO Western Regional Conference NPSTC Governing Board Meeting NCC Meetings <b>CAPRAD Training</b> [Session 6]	Las Vegas, NV Alexandria, VA Washington DC Denver, CO
March 18-19	700 MHz Regional Planning Committees Multi-Regional Colloquium	Chicago, IL
April 9-11 April 16-17	SDR Forum (33 <sup>rd</sup> General Meeting) IMSA Western Prairie Section Conference	Singapore



(Canadian 700MHz... continued from page 2)

In June of this year, the Canadian DTV framework was accepted and released by CRTC, allowing for DTV licensing and operations to proceed. The "Framework" also rewards those broadcasters that choose to license the allotments that were given to them with an expedited response - working contrary to our concerns, as these allotments are themselves the core problem. Furthermore, no date was set for the termination of analog operations. Although no licenses have been granted to date, the effects of a handful of stations going digital in the congested border areas may be enough to make band harmonization difficult until analog operations cease within Canada.



Despite this, announcements by Industry Canada at the RABC meeting following CANAPCO in October indicated that some portion of the spectrum will be harmonized within this band, and that harmonization will allow for 700 MHz public safety spectrum availability in the most congested areas of Canada.

NPSTC and their partners will continue to work towards a 700 MHz spectrum harmonization with Canada, and will provide a periodic status update on their progress. For further information, contact: *Sean O'Hara, Research and Communications Engineer, Syracuse Research Corporation* ohara@syrres.com ■

### Who is NPSTC?

NPSTC is a federation of associations that promote and facilitate the implementation of recommendations promulgated by the Public Safety Wireless Advisory Committee. Membership is open to individuals or organizations that have an interest in public safety communications. A Governing Board administers the affairs of NPSTC, based on the provisions of an organizational charter, and is presided by elected officers who are employees of public safety or public service organizations (as defined in the Public Safety Wireless Advisory Committee (PSWAC) Final Report) or an agent from a recognized organization that represents these entities. Members of the Governing Board are representatives of the following organizations:

*American Assoc. of State Highway and Transportation Officials*

*Assoc. of Public-Safety Communications Officials-International*

*Forestry Conservation Communications Assoc.*

*International Municipal Signal Assoc.*

*International Assoc. of Fire Chiefs*

*International Assoc. of Chiefs of Police*

*National Assoc. of State Telecommunications Directors*

*International Assoc. of Emergency Managers (Formerly National Coordinating Council for Emergency Management)*

*International Assoc. of Fish and Wildlife Agencies*

*National Assoc. of State Foresters*

*National Assoc. of State Emergency Medical Services Directors*

*Federal Emergency Management Agency*

The Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA) participate in NPSTC in a liaison capacity as do representatives from the Departments of Agriculture, Interior, Justice, and Treasury, the Federal Law enforcement Wireless Users Group (FLEWUG), and the Public Safety Wireless Network Program (PSWN). ■

*(800 MHz Made Easy... continued from page 1)*

susceptible to interference in that situation. This form of interference is particularly troublesome as there may be “dead zones” around dozens of cell sites throughout a wide area.

APCO and others have documented hundreds of instances of interference. Nextel has tried to correct those problems on a case-by-case basis, with varying levels of success. Note, that in some instances, the interference is actually caused by a other cellular providers, independent of or in combination with Nextel. The interference problem is also getting worse, as Nextel and others add more cell sites to accommodate their growing subscriber bases.

While case-by-case fixes might provide short-term relief, permanent solutions will require a reallocation of channels in the 800 MHz band to separate cellular frequencies from public safety and private wireless frequencies. That is where the concept of “800 MHz Re-Banding” comes into play.

The current 800 MHz allocation includes five basic “blocks” of channels (as depicted in figure 1 on page 1). Starting at the lowest portion of the band, there is a “General Category” block (806-809.75/851-854.75 MHz), which includes virtually every type of licensee (but relatively few public safety licensees in most parts of the country). The next block (809.75-816/854.75-861 MHz) consists of interleaved slivers of spectrum designated on an alternating basis for BILT (many of which are licensed to Nextel), Specialized Mobile Radio (mostly Nextel), and public safety use. Just above the interleaved channels is a large block (816-821/861-866 MHz) of “Upper 200 SMR” channels, virtually all of which are licensed to Nextel.

On the other side of the “Upper 200 SMR” channels are the National Public Safety Planning Advisory Committee (NPSPAC) channels (821-824/861-869 MHz), which provide the largest contiguous block of spectrum currently used by public safety agencies across the country. Those channels have been the subject of detailed regional plans and allotments to promote efficient and interoperable public safety com-

munications. Unfortunately, the NPSPAC channels are sandwiched between Nextel’s operations in the “Upper 200 SMR” channels and other cellular operations on channels above 824/869.

Thus, the current jumble of allocations in the 800 MHz bands allows for cellular type low-site operations (primarily Nextel’s) to use frequencies interspersed throughout the band. Fixing the problem requires a more rational assignment of channels, and a method of re-assignment that minimizes cost and disruption. Nextel, working with a coalition of private wireless and public safety organizations, has developed a “Consensus Plan” to re-configure the band and to pay for costs that public safety and private wireless licensees incur in the process. The Plan also yields some additional channels for public safety use.

The end result of the Consensus Plan would be that Nextel and most other low-site cellular operations would be at the upper portion of the 800 MHz band (above 816/861 MHz), and the lower portion would be reserved, with few exceptions, for high-site public safety and private wireless operations (see figure 2, page 6). The Plan accomplishes this through a series of complex steps, all of which are to be paid for by Nextel.

Public safety licensees now in the “interleaved” portion of the band (809-816/854-861 MHz) would not be required to move. However, those in 814-816/859-861 MHz, which will be designated as a “guard band,” will have the option to move to lower channels, further from Nextel’s channels.

The most significant move for public safety users would be shifting all of the NPSPAC channels as a block from the upper portion of the band (821-824/861-869 MHz) to the lower portion of the band (806-809/851-854 MHz).

Before the NPSPAC channel swap can occur, all non-Nextel licensees in that lower portion of the band will swap channels with Nextel and move into what is now interleaved spectrum. Once that is completed, Nextel will hold all of the lower band channels and will be able to “change places” with NPSPAC licensees at the high end of the band.

***The most important element of this plan is that no public safety agency will be required to change frequencies without payment from Nextel to cover all of the costs.***

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## NPSTC's Software Defined Radio Working Group – Off and Running in Boston

The NPSTC Software Defined Radio Working Group was formed this summer to address a number of aspects of Software Defined Radios as they relate to public safety. Software Defined Radio (SDR) technology is steadily evolving to provide greater flexibility in radio systems by implementing functions in software that traditionally have been implemented in hardware. The Working Group began by meeting with representatives of the Software Defined Radio Forum. The SDR Forum is an open, non-profit corporation dedicated to supporting the development, deployment, and use of open architectures for advanced wireless systems. The Forum membership is international, and growing.

NPSTC has joined the Forum to ensure that the interests of public safety are communicated to the SDR technology developers. Several Working Group members attended the SDR Forum General meeting held in Boston in June 2002. An overview of NPSTC was given by John Powell during the Forum meeting Plenary Session, and he also presented a briefing on "Software Defined Radios for Public Safety Land Mobile Radio" to a combined session of the SDR Forum's Technical and Regulatory Subcommittees. (These briefings are available for download from the SDR Forum's website, [www.sdrforum.org](http://www.sdrforum.org). Click on the Document List button on the left side of the home page, then scroll down to the briefings by John Powell, dated June 11, 2002.)

The NPSTC Working Group came away from the Boston meeting with an immediate opportunity to impact the work of

the SDR Forum. Working Group members provided significant input to the SDR Forum's midyear report to the FCC entitled "Report to FCC on Issues and Activities in the Area of Security in SDR." This document, which is available on the SDR Forum's website, is an Interim Report, and the NPSTC Working Group is planning additional input to



the Forum's Final Report.

Activities of the NPSTC Working Group are supported by the National Institute of Justice under their project for developing Interoperability Strategies for Public Safety (the AGILE Project). For more information, please contact one of the NPSTC Working Group members listed below:

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