



ARRL Spectrum Defense Matters

Volume #3
Issue #2
September 2012

A Note from the Chief Executive Officer

Study Could Lead to Receiver Performance Regulations



You are probably familiar with Section 6414 of Public Law 112-96, the Middle Class Tax Relief and Job Creation Act of 2012. This part of the law, adopted by Congress as H.R. 3630 in February and signed by President Obama later that month,

required the FCC to complete a study to identify, among other things, the effects of unreasonable or unnecessary private land use restrictions on residential antenna installations on Amateur Radio communications in emergencies and disaster relief. That study was completed on schedule and while we are disappointed with the superficial treatment of the issue by the FCC, the existence of the report gives us a basis for making our case for Congressional intervention.

Government Accountability Office

Another part of the law, Section 6408, requires the Comptroller General – the head of the Government Accountability Office (GAO) – to study and report on the design and operation of telecommunications transmission systems that use the radio spectrum “so that reasonable use of adjacent spectrum does not excessively impair the functioning of such system.” The report, which is due next February 22, is to consider, among other things, “the value of improving receiver performance as it relates to increasing spectral efficiency” and the feasibility of industry self-compliance vs. FCC and NTIA rules governing the use of adjacent portions of spectrum.

In This Issue

A Note from the Chief Executive Officer	Page 1
Protecting the Spectrum at Home	Page 2
Texas Club supports the Spectrum Defense Fund—AGAIN!	Page 3
A Note from the Chief Development Officer	Page 4

In the 1950s and '60s, anyone who tried to operate on 6 meters (50-54 MHz) in an area where television channel 2 (54-60 MHz) was in use quickly discovered that TV sets did not do a very good job of rejecting strong 6 meter signals.

You might wonder why Congress is interested in such an esoteric subject, particularly one that is dealt with routinely by the FCC, NTIA, and ITU. Remember LightSquared? It started out under another name as a mobile satellite communications company, licensed to use spectrum adjacent to a band used by GPS radionavigation satellites. As long as transmissions in both bands come from satellites that are thousands of miles from the receivers their signals are intended to reach, there is no compatibility issue. The problems began when LightSquared sought to use its spectrum for a terrestrial-only wireless broadband network, which would put its transmitters right in the midst of millions of GPS receivers that were not designed to reject strong signals in the adjacent band.

Advent of Cable Television

Radio amateurs are thoroughly familiar with the adjacent-spectrum issue. In the 1950s and '60s, anyone who tried to operate on 6 meters (50-54 MHz) in an area where television channel 2 (54-60 MHz) was in use quickly discovered that TV sets did not do a very good job of rejecting strong 6 meter signals. The problem often could be resolved by adding a high-pass filter just ahead of the TV tuner, and while most TV set manufacturers were willing to supply a filter free of charge they were not willing either to pay for installation in the field or to include the filters as an integral part of every set they sold. The advent of cable television helped but it was not until the transition to digital television, when the lower VHF TV channels were mostly abandoned by broadcasters, that it became possible for many amateurs to

As long as transmissions in both bands come from satellites that are thousands of miles from the receivers their signals are intended to reach, there is no compatibility issue.

use 6 meters without having to worry too much about neighborhood relations.

Resolving the GPS Interference Problem

In January 2011 the FCC granted a waiver to LightSquared for its terrestrial network, conditioned on resolving the GPS interference problem. The FCC immediately came in for intense criticism on the grounds that it had offered insufficient time for public comment on a serious technical issue and that it had granted the waiver subject to a condition that most knowledgeable observers were certain could not be met. More than a year later, after the NTIA completed a study that concluded there was no practical way to mitigate interference to GPS receivers, the FCC announced that the prohibition on LightSquared's commercial operations would remain in place and initiated steps to vacate the Conditional Waiver Order.

Three Primary Researchable Questions

While the LightSquared vs. GPS issue precipitated the Congressional action, the GAO study is much more broadly defined. The GAO has created three primary researchable questions to guide its review:

- (1) What tradeoffs exist to increasing spectrum efficiency through performance standards for receivers?
- (2) To what extent has the private sector taken steps related to receiver standards to minimize interference with systems operating in nearby spectrum?
- (3) To what extent have FCC and NTIA taken steps related to receiver standards to increase spectrum efficiency?

Continued on Page 4



Protecting the Spectrum at Home

By Chris Imlay, W3KD, ARRL General Counsel

In an issue of Spectrum Defense Matters a year ago, it was said that “defending our frequencies means protecting the way each of us chooses to enjoy Amateur Radio.”

I am proud to have been a part of the ARRL's spectrum defense team for the past 33 years. While perhaps the most visible of ARRL's spectrum defense and advocacy efforts take place at the WRC conferences, my part of the work of the ARRL's advocacy team in protecting spectrum is done at the Federal Communications Commission (FCC), at the National Telecommunications Information Administration (NTIA) and in Congress. There are really two, often distinct tables of frequency allocations: international tables and domestic ones. This is because administrations do not always implement in their home countries the allocations made internationally for their ITU region. The United States may have very specific needs for certain frequency bands that are not shared with other countries in ITU region 2, so the U.S. domestic table of allocations differs in some respects from the international allocations. That is fine as long as a domestic use in the United States does not conflict with another country's use of the same spectrum that is in accordance with the international table of allocations.

Amateur Allocations are Secondary

In the United States, radio amateurs normally think of the FCC as the agency which controls Amateur Radio allocations.

While that is basically true, and Amateur Radio allocations in the U.S. are added, deleted or changed from time to time through FCC notice and comment rulemaking proceedings, it is important to remember that almost all Amateur allocations above 225 MHz are shared with the United States Government. In most cases, Amateur allocations are secondary to U.S. Government agency uses. For example, the entire 420-450 MHz (70 cm) band is allocated in the United States to government radiolocation on a primary basis and to the Amateur Service on a secondary basis.

Allocated the Five Channels at 60 Meters

Radio amateurs have to always protect government uses of spectrum in those shared bands. Fortunately NTIA, which regulates U.S. government spectrum, is generally quite comfortable with Amateur Radio sharing of spectrum due to our high level of rule compliance and the nature of our operations. So NTIA is willing to allow Amateurs to continue to share portions of some very important spectrum. It is why we were allocated the five channels at 60 meters, for example. While we normally have a very compatible relationship with NTIA, and while NTIA can be our best spectrum defense partner, sometimes Federal agencies feel that the risk of interference to critical U.S. operations from additional Amateur Radio sharing requires NTIA to disallow expanded Amateur Radio sharing. While FCC is not absolutely bound to follow the advice of NTIA in allocations decisions, they would of course give NTIA's views a great deal of deference. NTIA often files comments in the same docket proceedings at FCC that ARRL does. Most of the time, our views are consistent with those of NTIA. Sometimes, however, they are not.

Extensive Interference Potential of BPL

This is because NTIA wears two hats. On the one hand, NTIA assigns channels and administers Federal government spectrum. In doing so, it tries to prevent interference between and among Federal users of spectrum. It also defends government allocations against incompatible non-government uses. However, NTIA is also the advocate on telecommunications issues for the incumbent Administration. So it is required to advocate telecommunications issues

that the administration favors. This is where we occasionally disagree with NTIA, and where NTIA occasionally is forced to send mixed signals. A good example of this is BPL. The Bush administration wanted to advocate BPL (and other broadband delivery mechanisms) aggressively. NTIA conducted and published a study which documented the extensive interference potential of BPL at significant distances from power lines. NTIA insisted on protection for government facilities by excluding BPL systems from those government allocations. At the same time, NTIA filed comments at the FCC which urged FCC to proceed with rules permitting BPL as a promising technology.

National Broadband Plan

In general, however, the spectrum defense efforts of the Federal government often determine our own ability to protect Amateur Radio allocations in the United States. Now, the United States government policy, as envisioned in the National Broadband Plan (NBP) is to allocate at least 500 MHz of spectrum between about 200 MHz and 4 GHz for wireless broadband over approximately the next 8 years. Of this, a good portion must come from U.S. government allocations. So far in this process, the Amateur Service has been only minimally affected, but the danger to a number of Amateur bands shared with the U.S. government remains very high indeed.

Typical Threat was the Reallocation

During my tenure with ARRL, domestic spectrum defense has changed considerably. In the 1980s and early 1990s, the typical threat was the reallocation of Amateur bands for other types of uses such as commercial land mobile radio, and the displacement of Amateurs completely. For example, we actively litigated the FCC decision to divide the band 220-225 MHz, initially allocated to the fixed, mobile and amateur services on a shared basis, into two bands: 220-222 MHz which went to the fixed and mobile services for commercial deployment; and 222-225 MHz which was to become exclusively Amateur spectrum. It was also during this period that the 2310-2390 MHz band, originally part of the 2300-2450 MHz amateur band, was reallocated for various purposes, leaving

Continued on Page 3

Get Your Gift Now!

2012 Spectrum Defense Mug and Pin!



Support Spectrum Defense with a gift of \$50 and you are eligible to receive our newly designed 2012 Spectrum Defense pin. Gifts of \$100 or more are eligible to receive both the mug and pin.

To receive your pin or mug, contribute via the ARRL Web site using the ARRL Donation form at www.arrl.org/arrl-donation-form, or make a one-time contribution by mailing the enclosed reply form with your check payable to the **ARRL Spectrum Defense Fund**, 225 Main Street, Newington, CT 06111.



Texas Club supports the Spectrum Defense Fund—AGAIN!

The Temple (Texas) Amateur Radio Club (TARC) has stepped up to the plate again by donating another \$1,000 to the ARRL Spectrum Defense Fund. This contribution brings the club's total contributions to \$7,000 since 2007.

"TARC is pleased to donate something back to the hobby that we all enjoy," said TARC President Robert Shoemaker, KE5WVC. "The ARRL Spectrum Defense Fund needs our support, and we hope this check helps."

Indeed it does! The contributions from TARC come from the proceeds of their twice-yearly HamEXPO! Swapfests, billed as the "friendliest ham swapfest in the world." The swapfest, held annually in April and October, draws about a thousand hams from all over Texas and surrounding states.

The club began in 1932 when a group of hams came together as the Cen-Tex Amateur Radio Club. TARC descended from that early club and today has members from Bell County and Central Texas. The club maintains 2 repeaters under its call sign W5LM, and actively participates in public service events.

TARC is proud of the ongoing support it gives to the Spectrum Defense Fund at such a high level. The entire club was on hand to present this latest donation, including an entire family of hams who are active members of the club.

ARRL urges other Amateur Radio clubs to consider the example of TARC and make an annual contribution to the Spectrum Defense Fund. Club donations, added to those of individual donors, ensures the strength of ARRL's work to defend Amateur Radio's operating frequencies every year.

For more information on how your club can participate, go www.arrl.org/spectrum-defense-fund or call the ARRL Development Office at 860-594-0348.

Protecting the Spectrum at Home

Continued from Page 2

the Amateur Service with access to the remainder. In more recent times, however, as the radio spectrum became more completely allocated, the domestic issues trended away from outright reallocation of Amateur bands. Now, typically, FCC proposes the addition (or "overlay") in Amateur bands of other types of uses, licensed and unlicensed. Most often, these overlay uses are unlicensed

(so-called "Part 15") devices. Examples of overlay uses in an Amateur band are the addition at 420-450 MHz of medical devices, public safety low power video transmitters, and wind profiler radars. Another recent example is the addition of medical body area networks in the 2390-2400 MHz band. Sometimes the proposed uses are compatible with Amateur operation, sometimes not. Our advocacy efforts are often aimed at noting

incompatibilities, in order to protect radio Amateurs from interference, and to protect Amateurs from allegations that they are creating interference to these additional sharing partners.

Accommodate New Technologies

Our prediction for the future of domestic spectrum protection is that these "overlays" of new RF uses in Amateur

Continued on Page 4



A Note from the Chief Executive Officer Study Could Lead to Receiver Performance Regulations

Continued from Page 1

For purposes of its study the GAO has defined "standards" broadly, to include mandatory or voluntary standards; federal regulations, requirements, or guidelines, etc.

Cynics will not expect much to result from the GAO study. They will reason that Congress has achieved its objective by being seen to "do something" in response to angry users and manufacturers of GPS devices on the one hand and aggrieved investors in LightSquared (which has filed for bankruptcy) on the other. By the time the GAO report reaches the House Committee on Energy and Commerce and the Senate Committee on Commerce, Science, and Transportation a new Congress, the 113th, will be in session and is likely to have other priorities.

ARRL is Monitoring Progress

Even so, the GAO has begun talking to stakeholders including FCC and NTIA, industry groups, spectrum users, device manufacturers, and researchers. The ARRL is monitoring progress and will provide input as appropriate.

In fact it is unlikely that the GAO will uncover anything new in the course of its research. The technical principles of adjacent channel interference have been well understood for decades. The ITU Radiocommunication Sector devotes a great deal of effort to studies of compatibility between different radiocommunication services. Receiver performance in the presence of strong adjacent channel signals involves economic tradeoffs that can be left to the marketplace to resolve.

What was wrong in the case of LightSquared was the attempt to change the rules so dramatically in the middle of the game. Exploring different ways of invoking standards won't help if the standards can be thrown out the window without adequate consideration of the consequences.

73,

David Sumner, K1ZZ
Chief Executive Officer

Protecting the Spectrum at Home

Continued from Page 3

allocations will continue, and will in fact increase. Congress has told FCC to accommodate new technologies, and to implement them quickly. The Communications Act of 1934 states that it is the policy of the United States to encourage the provision of new technologies and services to the public; and those who oppose a new technology or service has the burden of showing that it is adverse to the public interest. FCC, in proposing to accommodate these new technologies (and some old ones) in Amateur bands, often does so in our experience without a realistic assessment of the interference potential to or from Amateur Radio. Since Congress has handed us the burden of proving the incompatibility, that is what we have to do.

Never Seems Like Work

Domestic spectrum protection for Amateur Radio is done in a multitude of venues, including Congress, FCC and NTIA. It keeps ARRL's team very busy indeed. But it never seems like work. Ever.

Message from the Chief Development Officer

Dear Member,

Your continuing support as an ARRL member is the backbone of our success. Without your membership and your active participation in the operating activities we sponsor and the programs we offer, ARRL would not be the strong voice you expect and deserve. Thank you.



Equally important is your participation and financial support of the Spectrum Defense Fund, ARRL's annual campaign to fund the work conducted on your behalf at home and abroad. The more than \$350,000 we raise each year from individual members like you – and clubs like the Temple Amateur Radio Club in Texas – is dedicated solely to protecting our operating frequencies.

Without your membership and your active participation in the operating activities we sponsor and the programs we offer, ARRL would not be the strong voice you expect and deserve.

It is understandable that when there is a "wolf at the door" and an aspect of our spectrum is in danger that we receive a flood of contributions. Case in point was the work ARRL did against Broadband Over Power Lines (BPL) and when Little Leos threatened 2 meters back in 1996.

But it is perplexing that the day-to-day work of building relationships in official Washington and working for years on WRC conference issues do not reap the same financial success – even though the financial demands are just as great. Work done during these "quiet" periods may not be high profile, but it is equally important to build these strong foundations for the Amateur Radio service. Where might we be if a member of our Washington Office staff had not been sitting in an agency meeting when BPL was first presented?

And so, as you read this newsletter and follow the news posted regularly on the ARRL website (www.arrl.org), please consider how you can ensure our success in defending our spectrum. Each of us cannot do it alone but your donation to the Spectrum Defense Fund, together with contributions from thousands of other members, will ensure that we are prepared and informed for crises and attacks in the future.

There is no "wolf at the door" at the moment, but there are those who would use our spectrum for other uses. Take a moment and think about the Amateur Radio activity that means the most to you. Then, make a commitment now to support our vigilance. We cannot do it without you.

Thank you and 73,

Mary M. Hobart, K1MMH
Chief Development Officer
ARRL
225 Main Street
Newington, CT 06111
Telephone: 860-594-0397
E-mail: mhobart@arrl.org



Make your donation the easy way! Visit us at arrl.org, click the green DONATE NOW button and indicate your gift is for the Spectrum Defense Fund.