**2015 Annual Meeting, ARRL Board of Directors**

**Report of the Chief Technology Officer**

1. **Introduction**

ARRL’s centennial year brought a once in a lifetime opportunity for celebration. The year after the centennial brings what could be a once in a lifetime opportunity for an allocation near 5 MHz, and that opportunity brings a great deal of work with it.

Our international efforts at 5 MHz were very nicely summarized by CEO Sumner in the December 2014 edition of QST. We have a committed base of supportive countries upon which we are trying to build, and an equally committed base of countries in opposition, some of which oppose in a particularly strident manner. Many countries have yet to become fully engaged in the process, but will do so this year in a number of regional meetings, the Conference Preparatory Meeting in March, and, of course, WRC-15 in November.

We’re not just playing offense as WRC-15 approaches, sadly. A number of countries have already identified the 3400-3500 MHz segment of the 9 cm band for International Mobile Telecommunications (IMT)—ITU-speak for mobile cellular telephony and broadband data. The fight to maintain meaningful access to this segment is largely a country-by-country effort, and while we have numerous allies in maintaining the status quo here (satellite companies, aviation interests, and broadcasters), the mobile industry has generated a great deal of political will for substantial reallocations for IMT, and has explicitly asked the FCC to support an allocation at 3400-3800 MHz at WRC-15.

Our traditional allies on the government side of the ledger seem to want to stop this now, but a trusted ally with DoD has indicated that, in the long term, they are probably looking to find a workable sharing arrangement in the broader “C-band” (3400-4200 MHz). We can’t be opposed to a workable sharing arrangement if it is indeed workable, but with only a secondary allocation at 3400-3500 MHz, even being at the table to craft a workable arrangement will be an achievement. The mobile industry didn’t even talk with us before asking the FCC for the allocation at 3400-3800 MHz. When I asked why, I was bluntly told by a proponent, “You’re secondary. We don’t consider secondary services.”

Fortunately, both FCC and NTIA are showing an intent to seriously evaluate compatibility with incumbent systems, both in a controlled and uncontrolled setting. At the urging of our aforementioned trusted ally in DoD, General Counsel Imlay and I have been encouraging real-world compatibility evaluations in recent filings—see the “Model City” text in the report of the General Counsel for an example of the approach. We have clearly drawn a line in the sand for the legitimacy of compatibility testing—if Amateur Radio spectrum is involved, radio amateurs must be part of the testing, wherever it is conducted, unimpeded by the secondary status of the amateur allocation, and unimpeded by any municipal or private land use restrictions.

Facing these issues at home and abroad requires a substantial amount of time, travel, and resources. Nevertheless, we are mindful of our collective responsibility to the membership and to Amateur Radio to manage the organization in a responsible manner. During the budgeting process, all four staff officers took a hard look at how the Fairfax office has operated in the past and how it operates today. Given the evolving nature of spectrum management work and the different level of support that IARU officers demand now as opposed to five years ago, maintaining a physical office with support staff is no longer a necessity. The plan you are considering at this meeting proposes to close the office at the end of the lease on July 31. Jon Siverling and I would continue to be employed full time and would telecommute; the part-time administrative position would be eliminated. Annual savings from this adjustment would amount to just over $40,000.

Your staff officers by no means view this as an abandonment or diminishment of our Washington effort, but it is a change in paradigm that requires thoughtful consideration of our board. (It will also require some tough choices to be made if the board chooses a different path after such consideration.) I’ve had no questions from the board members to date about this aspect of the plan, which indicates one of two things—confidence in the approach, or a collective focus on other issues. If it is the former, thank you for the confidence. If it is the latter, this strikes me as a big enough shift where I must call it to your attention and invite questions. In that case, the invitation is hereby extended.

With that background, here’s what we’ve done since the centennial convention:

1. **ITU-R**
2. **WRC-15**

WRC-15 will be held in Geneva November 2-27. As a reminder, there are six items with potential impact (positive and negative) to Amateur Radio spectrum on the WRC-15 agenda. These items, in numerical order, are:

1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications;

1.4 to consider possible new allocation [sic] to the amateur service on a secondary basis within the band 5 250-5 450 kHz;

1.6.1 to consider possible additional primary allocations to the fixed-satellite service (Earth-to-space and space-to-Earth) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1 . . . and review the regulatory provisions on the current allocations to the fixed-satellite service within each range, taking into account the results of ITU R studies;

1.10 to consider spectrum requirements and possible additional spectrum allocations for the mobile-satellite service in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, including International Mobile Telecommunications (IMT), within the frequency range from 22 GHz to 26 GHz;

1.12 to consider an extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz; and

1.18 to consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band.

Additionally, there are several topics to be addressed in the report of the Director of the ITU Radiocommunication Bureau to WRC-15 that may have impact on non-spectrum issues within Amateur Radio. The most prominent of these topics from our perspective are issues relating to small communications satellites.

The Conference Preparatory Meeting, which produces a document summarizing the studies on each issue and proposing methods to satisfy each agenda item, will be held in Geneva March 23-April 1. The CPM text for agenda item 1.4 contains the following methods, some generous, and some not:

1. A secondary allocation to the amateur service between 5 275-5 450 kHz (proposed by Norway at the behest of Ole Garpestad);
2. A secondary allocation to the amateur service between 5 350-5 450 kHz (proposed by the Netherlands at the behest of Hans Blondeel Timmerman);
3. A generic method suggesting some sort of allocation to the amateur service of an unspecified amount of spectrum between 5 275-5 450 kHz (proposed by Canada);
4. Generic methods suggesting an allocation to the amateur service of an unspecified amount of spectrum that may be non-continuous, channelized, or limited in transmitter power (proposed by China); and
5. No change (proposed by Russia).

The portion of the text summarizing the studies fairly reflects the variety of views, and we will endeavor to maintain this at the CPM meeting.

1. **Working Parties 5A, 5B, and 5C: Study Group 5**

 Working Parties 5A, 5B, and 5C of Study Group 5 (Terrestrial Services) met in Geneva October 27-November 7, 2014, followed by a meeting of Study Group 5 on November 10 and 11. As usual, I attended these meetings as part of the United States Delegation and acted as United States spokesperson on Amateur Radio issues. Working Party 5A is responsible for the amateur and amateur-satellite services, the land mobile service above 30 MHz, and some limited applications in the fixed service. The meetings of Working Group 5A-1, dealing with the amateur and amateur-satellite services, were chaired by Dale Hughes, VK1DSH. IARU was represented by Vice President Ole Garpestad, LA2RR. Other radio amateurs participating included Bryan Rawlings, VE3QN, Ulrich Mueller, DK4VW, Ken Yamamoto, JA1CJP, and Hans Blondeel Timmerman, PB2T.

The Amateur Working Group had three major tasks for the meeting:

1. Finalizing a report describing the technical work done on agenda item 1.4, and elevate the report to draft status for approval at Study Group 5,
2. Draft a guide to ITU texts relevant to the amateur and amateur-satellite services for inclusion on the ITU web site, and
3. Review ITU documentation relevant to the amateur and amateur-satellite services to identify areas for future work.

The first task was accomplished in the first week of the meeting, and the report fairly reflects the various views on an allocation at 5 MHz and preserves a path to an affirmative result.

The remaining tasks were handled in week two. I commend your attention to the resulting guide to ITU texts relevant to the amateur services on the ITU web site:

<http://www.itu.int/oth/R0A06000067>

While short, the guide contains the text of Article 25 of the Radio Regulations (the Article that contains the high-level treaty provisions upon which individual countries structure their regulation of Amateur Radio) in its entirety, and provides descriptions of the various operational and technical texts relevant to Amateur Radio (specifications for Morse Code, Varicode, Q signals, sharing criteria, communications in emergencies or after disasters, etc.) It’s a pretty handy guide to the documentation that we amateurs have to maintain. If anyone wants to see the documents themselves, please ask.

Our review of the ITU documentation described in the guide identified several areas as ripe for review, including recommended standards for verifying the competency of amateur licensees. This is among the topics we will address at future meetings.

The reports relevant to WRC-15 agenda items 1.4 and 1.18 we’ve been crafting and following in Working Parties 5A and 5B over the last three years were approved without fanfare or rancor at Study Group 5 on November 10-11.

Following the meeting, on November 12 and 13, I stayed and switched to the IARU flag for the 2nd interregional workshop on WRC-15 preparations. The presentations from this meeting appear to be in front of the TIES firewall, so everyone should be able to freely access them at the following URL:

<http://www.itu.int/en/ITU-R/conferences/wrc/2015/irwsp/2014/Pages/default.aspx>

The written presentations are available under “input documents” to the right of this page. Additionally, archived floor audio is available under “webcast archives” for both this meeting and the first workshop, held in 2013. The webcast archives, in my view, give a particularly good insight into which agenda items are going smoothly and which ones aren’t. (5 MHz is somewhere in the middle.)

Here is my assessment of the items IARU has identified as of interest:

1.1 (mobile allocations for IMT and other broadband applications): Everyone wants to make new allocations, but no one wants to make new allocations in the same place. It’s looking increasingly likely that this item will be “resolved” by a hodgepodge of country footnotes, identifying several bands for IMT, but each only in a handful of countries. This is essentially the status quo.

1.4 (amateur secondary allocation near 5.3 MHz): We have our work cut out for us here. The most favorable region for our position is CITEL, thanks to the diligent and effective work of LABRE, my colleague Jon Siverling, and several volunteer IARU R2 representatives, but the CITEL position was described as “still under discussion.” This may be true, since Canada is influential and has a differing approach, but none of the other CITEL IAPs were presented as anything other than IAPs. From there, the next most favorable regions appear to be CEPT and APT. APT seems willing to consider an allocation, but not a broad one, and CEPT, which has a number of sympathetic administrations tempered by the opposition of Russia and, to a lesser extent, France, is being capably worked by Hans Blondeel Timmermann. The ATU position is still formative, but still disappointing; it seems to have been shaped largely by ASMG member Sudan, which hosted the first ATU prep meeting. Unsurprisingly, RCC and ASMG are non-starters, RCC because of its overhyped interference assessment, and ASMG purportedly because “there is not a high demand for amateur spectrum.”

1.6.1 (fixed satellite allocations in Region 1): While RCC is our opponent on 1.4, they are our friend here. A number of bands between 10 and 17 GHz were identified for consideration, and both RCC and CEPT (where the coordinator is also from an RCC member state) support fulfilling the item with bands above 13 GHz. ATU and ASMG have yet to form positions; the views of CITEL and APT are unlikely to matter much on a Region 1 issue.

1.10 (mobile satellite allocation between 22-26 GHz): Our 24 GHz amateur allocation is not under consideration here.

1.12 (600 MHz expansion of 9.3-9.9 GHz EESS allocation): The interference potential to amateur operation at 10 GHz is nominal, according to some pretty thorough studies, but our spaceborne operations are at some risk if EESS is granted primary status and we end up interfering with EESS. CEPT is supporting an expansion down to 9200 MHz and up to 10400 MHz, which avoids our amateur-satellite allocation and would probably be a good outcome.

1.18 (vehicular radiolocation at 77.5-78 GHz): Proponents of vehicular radiolocation have made a persuasive case for compatibility of automotive radars with radio amateurs, which supports a co-primary allocation. However, at least two European administrations don’t want to restrict the radiolocation allocation to automotive applications. No studies, and thus far no regions, support this approach. Our favored approach is supported by ATU and ASMG (?!), and the CEPT coordinator expressed his (but not yet CEPT’s) preference for that view on the floor, as did Wayne Whyte of NASA and yours truly.

9.1.4 (restructuring of the ITU Radio Regulations): This item never really gained a lot of traction; the CPM text proposes little more than removing some arcane synonyms for LF, MF, HF, VHF, etc. A delegate from Iran wondered why this was even added to the agenda, which was funny, considering he was, as best I can recall, the primary proponent of adding this to the agenda during the relevant WRC-12 debates. At any rate, it may be too late to use this a vehicle to seek liberalization of the third party provisions of Article 25.

9.1.8 (nanosats and picosats): Almost everyone seems to agree that a sustained educational effort to make administrations and operators aware of the factors affecting the choice of an appropriate service and operating frequency, as well as the notification and reporting provisions), is in order. Beyond that, some folks want nothing more, and some folks want more work to be done at WRC-19, but have yet to really define what.

1. **Joint Task Group 4-5-6-7**

The Joint Task Group (JTG) is designed to ensure all interested stakeholders are present for consideration of studies relating to agenda item 1.1. As a result, the meetings are exceptionally large. I attended the final meeting of the JTG from July 23-31 in Geneva as a United States delegate.

As for bands that made the final list of "potential candidate bands" for IMT identification, there are three to watch:

3300-3400 MHz: This was proposed by China for indoor, small-cell use only, and doesn't seem to be gaining much traction beyond China (Western industry doesn't seem to want it).

3400-3600 MHz: No surprise here. The worst outcome would be the removal of the PFD limit in the existing identification for IMT, but the resistance to that idea is strong.

5725-5850 MHz: A number of folks want to use this range for RLANs under technical parameters similar to those authorized in the United States, although the consequences of an RR provision may be more profound than those of the USA's Part 15 approach.

As I have stated above, defending secondary allocations is difficult because there is an unwarranted tendency to completely discount them. Since we have no primary allocation in the international table anywhere in the world between 440 MHz and 24 GHz (225 MHz and 24 GHz in the Americas), our secondary allocations in this range are important, and we will continue to vigorously defend them at this month’s final JTG meeting and beyond.

1. **Inter-American Telecommunications Commission (CITEL)**

CITEL is the regional telecommunications organization for the Americas, part of the Organization of American States (OAS), with a secretariat in Washington. Jon Siverling participates in CITEL activities as a member of the US Delegation. IARU Region 2 is a recognized observer, usually represented by a member of the Executive Committee.

The technical work of CITEL is divided into two Permanent Consultative Committees (PCCs). PCC.I (Telecommunications/Information and Communication Technologies) met in Ascunsion, Paraguay, from August 4-8. Emergency communications is among the topics considered by PCC.I, and Jon Siverling chairs the Rapporteur Group on the Use of Telecommunications in the Prevention and Mitigation of Catastrophes and Disasters. Jon’s leadership and contributions continue to be universally well received.

PCC.II (Radiocommunications including Broadcasting) handles matters affecting spectrum allocation, including regional preparations for WRC-15. PCC.II met in Merida, Mexico, September 29-October 3.

A significant positive development of 5 MHz occurred at this meeting six CITEL member states expressed support for a proposal to allocate 5275-5450 kHz to the amateur service on a worldwide, secondary basis. The support of six member states was sufficient to ratify the proposal as an Inter-American Proposal (IAP) to WRC-15, and I discussed the presentation of this IAP at a Geneva meeting above.

There were actually two affirmative proposals the meeting: the one above from Brazil, and a less generous but well-intended one from Canada, which proposed to allocate 50 kHz in two 25 kHz chunks. Even the Canadian proposal required a lot of persuasive work on the part of RAC, and until the week before the meeting, it appeared Canada’s proposal would likely be the only one brought to the meeting. We learned that LABRE had persuaded ANATEL, the Brazilian regulator, to make the more generous proposal, and that LABRE would have someone at the meeting.

I'll leave it to the words (in italics below) of my colleague Jonathan Siverling, WB3ERA, to report what happened on the ground (I am amalgamating from several emails; any error is mine alone and attributable to the amalgamation):

*Brasil’s contribution has just now become an Inter American Proposal (IAP). The six administrations making it an IAP are: Argentina, Brazil, the Dominican Republic, El Salvador, Nicaragua and Uruguay.*

*Canada’s contribution, lacking any additional support, will go forward as a Preliminary Proposal (PP).*

*Very large, heavy piles of credit have been earned by the years of efforts of [LABRE's] Flávio A. B. Archangelo (PY2ZX) before this meeting \*and\* at this meeting, as well as Ricardo Luis Terán (LU4FTV) (ARG) and Hector Carril (ARG) at the meeting this week.*

Jon didn’t list himself, but he deserves a large, heavy pile of credit too. While the United States position on agenda item 1.4 was to remain silent in light of our domestic disagreement, Jon’s years of experience at and universal respect within CITEL give Amateur Radio substantial clout there, and Jon no doubt facilitated the accumulation of support quietly, as he had to do given the party line of the United States.

CITEL is but one of six regional organizations that submit regional proposals to the ITU. Two of these, sadly, are almost certain no change supporters, leaving CEPT, ATU, and APT as the next targets to generate affirmative proposals. Candidly, I think anything that comes out of the WRC-15 is likely to be closer to what Canada is proposing (and what RAC fought hard for) than what got adopted as an IAP today, given the difficult path for the rest of the world. I’d like to be wrong, and I still might be.

1. **USTTI Amateur Radio Administration Course**

Students from Thailand, Ghana, and Papua New Guinea attended the 31st United States Telecommunications Training Institute (USTTI) Amateur Radio Administration Course (ARAC) September 29-October 3 at ARRL Headquarters. Two participants got their US Amateur Radio licenses as the course wrapped up. I served as chief instructor of the course, which is designed for government officials in developing countries who regulate and manage Amateur Radio. Lisa Kustosik coordinated the League’s participation with USTTI and hosted the students. Program participants work in their respective government’s telecommunication offices, where they have responsibilities for Amateur Radio licensing and regulation as well as preparation for international conferences.

Our students — Annop Nittaya, HS1PLO, and Virat Uansri from Thailand, Peter Djakwah, KM4EQL, of Ghana, and Oki Gari, KM4EQM, of Papua New Guinea — were already quite knowledgeable about Amateur Radio, and are committed to the further development of Amateur Radio in their countries. All left with a profound understanding of the unique nature and needs of the Amateur Radio Service.

Several ARRL staff members delivered classroom presentations within their areas of expertise. Emergency Preparedness Manager Mike Corey, KI1U, taught a unit on Amateur Radio’s public service, emergency, and disaster communication capabilities. ARRL Regulatory Information Manager Dan Henderson, N1ND, and ARRL VEC Manager Maria Somma, AB1FM, discussed licensing, examination and regulatory issues. Membership and Volunteer Programs Assistant Manager Norm Fusaro, W3IZ, talked about developing Amateur Radio capabilities through club activity. ARRL Laboratory Engineer Bob Allison, WB1GCM, assisted by ARRL Laboratory Volunteers Lori Kosior, KB1ZML, and Pete Turbide, W1PT, supervised each student’s successful assembly of a 40 meter receiver kit. Each student took his assembled receiver home.

The students had a particular interest in licensing, and Djakwah and Gari took examinations for the United States Technician license during their time at ARRL Headquarters. An ARRL VEC team comprising Somma, Corey, Field Organization Supervisor Steve Ewald, WV1X, and Outgoing QSL Bureau Associate Rose-Anne Lawrence, KB1DMW, administered the test, which both passed.

I continue to find the ARAC week one of the most rewarding each year, both personally and professionally. We routinely find ARAC alumni at international meetings, helping us get things we want to get done done. The next ARAC course is planned for the fall of 2015.

1. **United States ITU Association**

USITUA seeks to develop positions on ITU activities reflecting the consensus of its private sector members and to advocate these positions to government officials responsible for forming United States ITU policy. ARRL is one more than forty USITUA members, and I serve as a director of the association. Two other members of USITUA (without board seats) are represented by radio amateurs: Juniper Networks (by Tom Walsh, K1TW) and Raytheon (by former ARRL Arizona Section Manager Tom Fagan, K7DF).

Much of USITUA’s efforts over the past few years have been focused away from radio issues. Regrettably, this continued to be the case in the second half of 2015, as the ITU Plenipotentiary Conference approaches later this year. Jon Siverling continues to capably lead a USITUA ad hoc group on CITEL issues, on which his expertise is without peer. We are among several Association members who have expressed concern that radio issues are getting short shrift, with WRC-15 now within the calendar year. Fortunately, the trend appears to show some sign of turning.

1. **General Technology Issues and Domestic FCC Advocacy**

I advised General Counsel Imlay and the Executive Committee on a number of issues, including our response to the FCC’s inquiry on the suitability of millimeter-wave bands for mobile service use, and the use of a “Model City” for real world testing of compatibility of various radio services. Chris described these items in his extensive report. I continue to draft, as necessary, comments in response to proposals from the FCC’s WRC-15 Advisory Committee, on which I serve.

An observation was made on the ODV reflector that the recently completed Report to America could have been strengthened by a description of Amateur Radio’s ongoing contributions to technological advancement. I suggest that there the community continues to advance the radio art, particularly in digital techniques at HF, but that such advances are, for the lack of a better term, less “sexy” than recent commercial advances in telecommunications, and that such advances, while very worthwhile, are less persuasive to legislators than our public service. If the board decides that technology should be a part of the Report to America going forward, I will be pleased to provide appropriate content, with the caveat above.

1. **Conclusion**

As always, questions and input from members of the Board are welcome. Last year was one of celebration. This year will be one of lots of work, particularly on WRC-15 and 5 MHz. As Dave pledged in his December 2014 editorial, we’ll work—and fight—until we win or until we run out of time. Thank you for your support.

73,



Brennan T. Price, N4QX

Chief Technology Officer

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