

The Importance of Showing Up: Amateur Radio at the 2019 World Radiocommunication Conference

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In 1903, alarmed by the rising cacophony that the nascent radio spectrum had become, a small group of nations met in Berlin to craft a set of rules that would, it was hoped, bring order and allow the new medium of radiotelegraphy to develop – indeed – to survive.

It is not hard to imagine what the airwaves must have sounded like as an unmanaged sea of spark transmitters assaulted the ears. In the midst of high-power commercial transmitters, naval shore stations, ships at sea, etc., were an army of “experimenters” and also many whose motives for adding noise to the spectrum were more nefarious.

Somehow, through a combination of good luck and good representation, those “experimenters” – who would later call themselves Radio Amateurs or “hams” – survived. Their early start was not auspicious: “experimenters” were banished to frequencies above 1500 kilohertz – then thought to be useless spectrum.

From the International Wireless Telegraphy Convention of 1906 through the *Comité Consultatif International pour la Radio* (CCIR) to the International Telecommunication Union (ITU), under the auspices of the League of Nations and then the United Nations, in peacetime and in war, in good times and in bad, international regulation of the radio spectrum has survived. It has continued and it has adapted as the underlying technologies have kept up their relentless evolution.

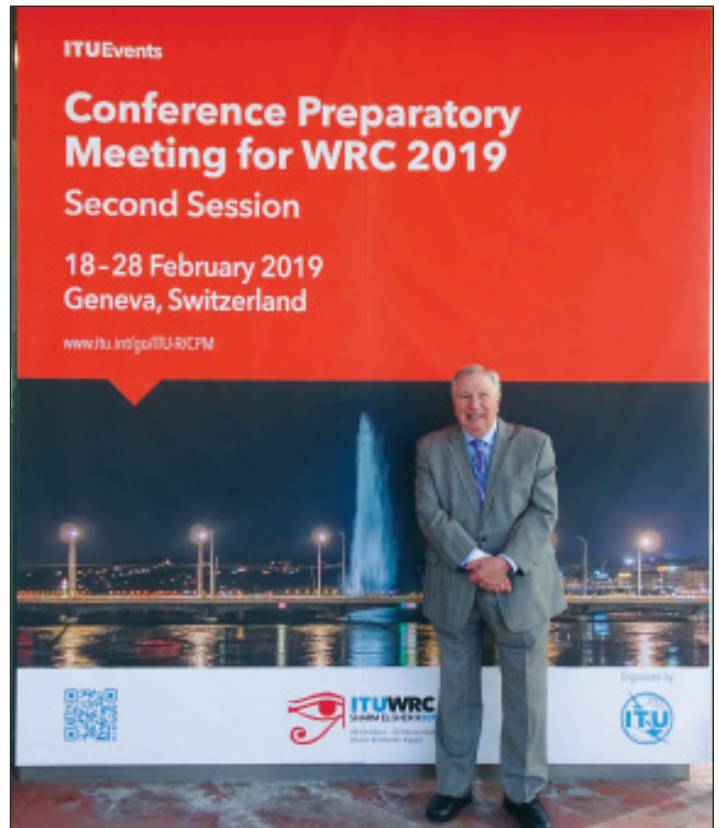
And so has Amateur Radio continued and adapted and – above all – survived in no small measure because Radio Amateurs have continued to show up and participate in the international discussions that continuously review and revise radio services and the frequency bands which they are authorized to use. The *Radio Regulations*, an international treaty which the ITU manages, explicitly includes the Amateur Radio Service and the Amateur Satellite Service – a fact that gives us standing alongside those who look out for broadcasting, mobile radio and satellite services – among others.

As an agency of the United Nations, the ITU effects changes to the *Radio Regulations* through a formal process that periodically brings together representatives of the UN’s 193 member states at a World Radiocommunication Conference (WRC). Once convened every decade, these meetings are now held on average every four or five years. The last was in 2015 and the next will be held later this year.

A gathering of over 3,000 delegates lasting a month and conducted in the UN’s six official languages cannot easily be held in your average convention centre.

For that reason WRC’s are almost always held in Geneva, Switzerland using the three buildings of the ITU and the adjacent Geneva International Conference Centre (CICG).

Note: this article was published in the May-June 2019 issue of The Canadian Amateur (TCA) magazine. For more information about TCA please see page 3 and visit <https://wp.rac.ca/tca/>



Bryan Rawlings, VE3QN, RAC Special Advisor, attending the Conference Preparatory Meeting in Geneva, Switzerland in February 2019.

But there have been exceptions and the upcoming WRC-19 is slated to be one. The ITU, acting on the recommendation of its member states, has accepted the invitation of the Government of Egypt to hold WRC-19 at its Sharm El-Sheikh International Conference Centre beginning on October 28, 2019.

The issues to be acted upon at the Conference were chosen at the end of the 2015 Conference and have been debated and refined through six Preparatory Meetings lasting two weeks each held at the ITU in Geneva over the past four years. As a member of the Canadian Delegation I have attended these meetings and have participated in Working Groups on the issues affecting the Amateur Radio Service.

A final step in this process took place at the end of February when some 1,500 delegates assembled in Geneva for the second and final Conference Preparatory Meeting (CPM 19-2) to put the final touches on proposed solutions or “methods” which, it is hoped, will guide the delegates in negotiating what changes to make to the international radio regulations so as to satisfy the agenda items.

The delegates comprised representatives of the ITU’s member states as well as representatives from many of the ITU’s “Sector Members” which includes – notably – the International Amateur Radio Union (IARU).

It’s important to point out that the actual voting delegates in the WRC-19 Conference may not be and often aren’t the experts who have researched the agenda items through the previous years. This makes it important that the conference material be as concise and actionable as possible.

Voting is restricted to the representatives of the ITU member states; the International Amateur Radio Union (IARU), for example, participates in the preparatory meetings but does not vote in the Conference. Therefore, Radio Amateurs in ITU member countries should try to ensure that their governments understand the importance of the Amateur Radio issues and the implications of the options being considered.

Finally, it has been the ITU's practice since the 1990s to resolve agenda items by consensus rather than majority vote – a high bar often leading to cliffhangers on contentious issues.

So, for Radio Amateurs, what are some of the issues we have been watching closely over the past four years in preparation for WRC-19?

Six Metres Worldwide (AI 1.1)

In ITU Region 2 (the Americas) and Region 3 (Asia Pacific) Amateurs have enjoyed for decades a primary allocation in 50 to 54 MHz. In Region 1 (Europe, the Mid-East and Africa) individual states have made local allocations to their Amateurs – often for two or less MHz and usually as secondary users. WRC-19 Agenda Item 1.1 seeks to extend the same 4 MHz primary allocation to Region 1 as exists in the other two ITU regions.

It won't be easy. There has been significant debate as to why Amateurs need four megahertz and why they need a primary allocation vs a secondary one. There are also issues on how Region 1 Amateurs are going to protect the remaining analog television stations as well as a small number of wind-profiler radars and – most challenging of all – land mobile radio systems.

As the Conference Preparatory Meeting wound up in the last week of February in Geneva those became the choices the WRC delegates will be given in the fall: 4 MHz or 2 MHz, a primary or a secondary allocation or a combination of both. And, as always, a method for "No Change". (There is also a "method" which would grant only 200 kHz; however, it is not likely to gain much traction).

International Mobile Telephony (5G IMT) (AI 1.13)

We hear it every day: 5G mobile is coming. To fully realize the potential of this latest generation of mobile telephony



Members of the Canadian Delegation to CPM-2. Front row from right to left: Veena Rawat, VA3ITU (GSMA), Venkatesh Sampath (Ericsson Canada), David Willis (ISED and Head of Delegation), Michael Christensen, VE3QMC (ISED), Cindy-Lee Cook (ISED), Serge Bertuzzo, VA3SB (Bell Canada). Back Row, right to left: Ali Shoamanesh (Telesat), Mahmud Rahman (ISED). Photo courtesy of Daniel Gratton (Canadian Space Agency).

the cellular industry is looking for an allocation to the Mobile Service of several contiguous gigahertz of spectrum somewhere in 24.25 to 86 GHz.

It's sobering to note that while HF Amateurs have a large set of primary allocations between 1.8 and 29.7 MHz, very few of the allocations to the Amateur Radio Service above our two-metre band are primary. One of these is our 6 mm band in 47 to 47.2 GHz. We have thus joined our voices to many other users in seeking assurances that our uses – current and future – of this piece of spectrum will not be impacted by whatever decision is taken for Agenda Item 1.13.

In what has been a long and contentious series of meetings at the CPM 19-2 meetings involving the many stakeholders in this spectrum, our 6 mm band appears not likely to be seriously considered in the 2019 Conference. That said, it is quite possible this piece of spectrum may be considered again in the 2023 Conference and the Amateur community will be well served if we continue to document the uses Amateurs are making of the band. Additionally, we will likely have to be involved in technically intense studies of compatibility between our uses of the band and 5G IMT.

Wireless Access Nodes and RLAN's (AI 1.16)

This agenda item has at its heart an expansion of the number and capability of wireless access nodes in the 5 GHz spectrum used ubiquitously for Wi-Fi, broadband delivery of Internet and

entertainment services and as Radio Local Area Networks among other uses.

In play are an expansion of the frequency ranges within which these systems are deployed, an increase in the power levels they are permitted, deployment outdoors rather than strictly indoors, and the use of gain antennas.

Power levels, currently limited to 200 mW, could be increased to 1 Watt; there would be outdoor installations and these could employ antennas with a maximum gain of 6 dBi; strictly limited, however, to radiation under 30 degrees elevation.

There are five frequency segments being considered between 5150 and 5925 MHz. Of these, the two of interest to Canadian Amateurs are 5725 to 5850 and 5850 to 5925 MHz. There is a worldwide allocation to the Amateur Service in 5650 to 5850 MHz and in Region 2 Canadian Amateurs also have an allocation in 5850 to 5925 MHz. All of this is secondary spectrum. Extensive deployment of wireless access points in these bands and in the manners described above could significantly raise the noise floor and impact the many activities Amateur microwave operators undertake which rely on low noise to detect weak signals.

The most likely outcome for the 5850 to 5925 MHz range is that the Conference will choose to make no change. As for 5725 to 5850 MHz, it is also very likely that the outcome will be "no change"; however, there are two other "methods" here. One of these might authorize expanded RLAN deployment with,

however, strict limitations to use indoors and at powers no higher than 200 mW. So there is reason for cautious optimism; however, as in so many other things in life, "It's not over till it's over".

It is worth noting that, WRC-19 notwithstanding, RLAN activity has been possible for some time in 5725 to 5875 MHz under the rules governing the use of bands allocated for Industrial, Scientific and Medical (ISM) operations.

Wireless Power Transfer for Electric Vehicles (AI 9.1.6)

We are all aware that many modern electronic devices, e.g., smartphones and electronic "smartwatches", now come with the option of being charged wirelessly. The technology by which this is done can generate spurious signals in the radio spectrum. Generally, this has not been a serious problem at the power levels these wireless chargers employ.

Wireless charging of electric vehicles (EV) – buses, trucks and cars – through wireless power transfer (WPT) presents a more serious concern. WRC-19 Agenda Item 9.1.6 seeks to identify a frequency range where these technologies might operate so as to "minimize the impact on radiocommunication services from WPT for electrical vehicles".

The preliminary activities addressing this item have studied WPT (EV) in 25 to 90 kHz with 79 – 90 kHz as the range most likely to be identified. It is not yet clear what level of harmonics and spurious emissions these high-power and long-duration charging systems might cause through the LF, MF and HF portions of the spectrum and over what distances. While studies have shown WPT (EV) may meet existing criteria for spurious emissions, these limits do not necessarily ensure protection of radio services. Amateurs will therefore be closely following how this issue is addressed in the Conference and beyond.

From the foregoing it will be apparent that the participation of Radio Amateurs through the cycle of activities leading up to a World Radiocommunication Conference and in the Conference itself is essential so as to ensure that our interests are put forward and our rights as defined in the *Radio Regulations* are respected. Radio Amateurs have been fortunate that the International Amateur Radio Union as well as a number of national Amateur societies – notably including Radio Amateurs of Canada – have over several decades fulfilled this task generally with success

and have earned the respect of the many other stakeholders in the arena of international radio regulation. We have, to put it succinctly, continued to "show up".

The pace of technology shows no sign of slowing. Amateurs who show up at the ITU have to have the skills to argue the merits of the Amateur Radio Service – often to conference delegates whose understanding of Amateur Radio is vague or coloured by out-of-date impressions. They have to be skilled in the highly technical and formal processes by which competing claims for spectrum are studied for compatibility and sharing. A very simplified overview of these processes can be found on the RAC website at <https://wp.rac.ca/wrc/>. Of the many ways our Amateurs can approach these challenges, a "keep your hands off our bands" approach is the least likely to succeed.

It is difficult to overestimate the high regard in which Canada is held on these Amateur issues. We are blessed with a regulator who has consistently recognized our contributions and has always approached the Amateur issues with attentiveness and sympathy. Canada is one of very few countries where the national Amateur society has for decades been willing to fund a delegate to participate in these issues.

None of this happens without money. Geneva is a very expensive city. The delegates from government and commercial interests have financial resources available to them that Amateurs do not. Even though the Amateurs involved work pro bono, the costs of their attendance at these meetings are considerable.

The Defence of Amateur Fund (DARF) is administered by RAC completely separately from RAC's other operations. Your contributions to DARF, at the time of membership renewal, through the generosity of your Amateur club, by testamentary bequeath and otherwise, will help ensure that this work continues.

Finally, following the 2019 Conference, I expect my involvement in this work to take on a more modest and supportive character. It has been the highlight of my Amateur Radio career and an immense honour to represent Canadian Amateurs over the past 10 years and I would like to express my gratitude to RAC and its officers for giving me this opportunity and for their unfailing confidence in my efforts.

– 73, Bryan, VE3QN

Our Canadian Delegate: Bryan Rawlings, VE3QN

Our delegate, Bryan Rawlings, VE3QN, the RAC Special Advisor at World Radiocommunication Conferences, regularly keeps us all up to date – through articles in *The Canadian Amateur* and on the RAC website – on the issues and processes that ultimately determine Amateur Radio frequencies around the world.

In the November-December 2014 issue of *The Canadian Amateur* magazine, Bryan wrote an article about "An Amateur Radio Approach to Spectrum Sharing Studies". A PDF version of the article is available at: <https://wp.rac.ca/wrc/>

Between one WRC and the next are many preparatory sessions where the real work to shape, negotiate and defend allocations take place. Our delegate typically attends two of these meetings each year, each lasting 10 to 12 days and from 2016 to 2019, Bryan has travelled to Geneva, Switzerland to attend the Preparatory Meetings for the 2019 World Radiocommunication Conference (WRC-19). You can find more information about these meetings at the links below.

In 1991, the Defence of Amateur Radio Fund (DARF), was created by Tom Atkins, VE3CDM (SK) and Bill Loucks, VE3AR (SK), to provide funding to ensure that a Canadian Radio Amateur would be part of these critical processes. Over the years, this need has only grown more critical with the explosion of mobile services and the need for more spectrum to service them.

Note: It costs a lot to send a person to Geneva to work and live for almost a month, even with discounted airfare and hotel rates. If you have not contributed to the Defence of Amateur Radio Fund (DARF), please consider making a personal donation and also suggest a club donation to DARF at your next club meeting.

For more information about DARF please visit <https://darf.rac.ca>.

The Canadian Amateur (TCA), Canada's premiere national magazine devoted to Amateur Radio, is published six times per year and is the membership journal of the Radio Amateurs of Canada (RAC). It is available in both print and digital versions (eTCA).

Members of RAC, Canada's sole national Amateur Radio organization, receive TCA automatically. A subscription to TCA also provides membership in Radio Amateurs of Canada. RAC is also the publisher of TCA. For more information please visit <https://wp.rac.ca/tca/>