



## It Seems to Us

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# Small Satellites of the Non-Amateur Kind

*“Sometimes success is measured not by what you gain but by what you avoid.”*

Last month we talked about the new HF allocation that the Amateur Service gained at last November’s World Radiocommunication Conference (WRC-15). It’s important to know three things about WRCs.

First, they are intergovernmental meetings, not meetings of the various radio services to which the radio spectrum has been allocated. Representatives of the radio services participate, both on national delegations and as observers, but the Member States of the International Telecommunication Union (ITU) make the decisions. A few radio amateurs are invited to serve on national delegations specifically to represent the interests of Amateur Radio, usually with their expenses covered by their International Amateur Radio Union (IARU) member-society. The freedom of action accorded to them varies greatly from country to country, but in the end they all must adhere to their delegations’ respective positions. The IARU fields a small team of observers who play an essential monitoring and networking role.

Second, while it has not always been the case, decisions at WRCs now are made by consensus. The last time a vote was taken at a WRC was in 1995. Any Member State can block a decision if it objects strongly and is willing to resist great pressure to conform. Finding solutions that everyone can live with is an art that sometimes defies science and can involve high-stakes horse trading.

Finally, the business of a WRC is business. The international Radio Regulations exist mainly to protect the value of trillions of dollars of investment in satellites and other telecommunications hardware. The WRC agenda items that draw the most attention are the ones with the greatest potential to encourage new investment. The fact that Amateur Radio is taken seriously in this environment is testimony to decades of responsible participation in ITU affairs by generations of IARU representatives.

The Amateur and Amateur-Satellite Services are in the category of incumbent radio services. Our existing allocations are coveted by others. We should count it as a success any time we reach the end of a WRC without significant new constraints on the spectrum access we already enjoy. As discussed here last month, at WRC-15 we did better than that. But wait — there’s more.

Radio amateurs pioneered small satellites. We continue to build and to find launch opportunities for them. For decades we have been working with universities to accommodate non-commercial educational satellites within the Amateur-Satellite Service. It has been a mutually beneficial relationship and is consistent with our self-training mission.

In general, satellites are tightly regulated. Thanks to some farsighted work by the IARU way back in 1979, the Amateur-Satellite Service is exempted from some burdensome international regulations. This is good for us, but also creates potential for abuse. Increasingly, builders of small satellites with missions that fall outside the scope of the Amateur and Amateur-Satellite Services seek

to take advantage of these exemptions and of our allocations, particularly in the 144 – 146 MHz and 435 – 438 MHz bands.

Four years ago this month, WRC-12 adopted two resolutions calling on the next WRC after WRC-15 to consider changes in regulatory procedures (but not allocations) to facilitate the deployment of small (less than 10 kg in mass) nanosatellites and picosatellites. At the time it was noted that many such satellites use spectrum allocated to the Amateur-Satellite and MetSat services “although their missions are potentially inconsistent with these services.”

One of the tasks facing WRC-15 was the preparation of a recommended agenda for the next WRC, now scheduled for 2019. The proposed agenda item dealing with this topic turned out to be one of the most contentious. Replacing the two WRC-12 resolutions are two new ones calling for a study of “...the spectrum needs for telemetry, tracking and command in the space operation service for non-GSO [non-geostationary-orbit] satellites with short duration [typically not more than three years] missions.” If the current allocations to the space operation service are found to be inadequate there are to be “sharing and compatibility studies” and the study of “mitigation techniques to protect incumbent services, both in-band as well as in adjacent bands” in order to consider new or upgraded allocations to the space operation service in certain frequency ranges.

For us, here is the most important part: the frequency ranges earmarked for consideration **exclude all existing amateur or amateur-satellite allocations**. While the two meter band was vulnerable at an early stage and the 420 – 450 MHz band remained so right up to the very last minute, in the end the conference chose to limit consideration to the frequency ranges of 150.05 – 174 MHz and 400.15 – 420 MHz.

The IARU team and our friends on national delegations worked hard to achieve this result and we all felt great relief once the outcome was assured. Participation in the sharing, compatibility, and mitigation studies to be undertaken between now and 2019 would have been absolutely essential, requiring the commitment of significant personnel and financial resources. Instead we will be able to focus on other WRC-19 issues, including improvements to the 6 meter band in ITU Region 1 and threats to several microwave allocations.

A particularly ominous topic identified as requiring urgent studies in advance of WRC-19 is Wireless Power Transmission (WPT) for electric vehicles. If poorly implemented, WPT could be a catastrophic source of interference to radiocommunication services.

It feels good to have avoided a spectrum defense challenge. We face enough of them already.

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