Amateur / RNSS Coexistence in the 23cm Band

- Barry Lewis G4SJH
- WRC23 Agenda Item 9.1 topic b)
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International Amateur Radio Union - Working for the future of amateur radio

First – the Training!



- ITU-R refers to the Radiocommunication sector of the International Telecommunications Union (which is a UN agency).
 - It hosts the 'Study Groups' organised by radio communication services.
 - It works mainly by Resolutions and Study Questions.
- The Radio Regulations (RR) are published by the ITU-R



ITU Radio Regulations

The ITU Radio Regulations is a basic document of the International Telecommunication Union that regulates on law of nations scale radiocommunication services and the utilisation of radio frequencies. **Wikipedia**



• The WRC is the World Radio Conference scheduled every 4 years or so and is the **only body with authority to update the RR**.





Introduction and the inter-related elements

- ITU-R World Radio Conference WRC-23 Agenda Item 9.1Topic b
 - WRC-23 Agenda Item was proposed and agreed at WRC-19.
 - ITU-R Resolution 774 lays out the background and *invites* the studies.

Agenda Item 9.1 topic b text:

Review of the amateur service and the amateur-satellite service allocations in the frequency band 1 240-1 300 MHz to determine if additional measures are required to ensure protection of the radionavigation-satellite (space-to-Earth) service operating in the same band in accordance with Resolution **774 (WRC-19)**; Resolution 774 Extract (*resolves to invite the ITU-R Sector*):
1 to perform a detailed review of the different systems and applications used in the amateur service and amateur-satellite service allocations in the frequency band 1 240-1 300 MHz;
2 taking into account the results of the above review, to study possible technical and operational measures to ensure the protection of RNSS (space-to-Earth) receivers from the amateur and amateur-satellite services in the frequency band 1 240-1 300 MHz, without considering the removal of these amateur and amateur-satellite service services.



The problem for the amateur services

- Frequency allocation status:
 - Amateur Service (1240-1300 MHz) is allocated on a Secondary basis in the ITU-R Radio Regulations.
 - Amateur Satellite Service (1260 1270 MHz) is also allocated on a Secondary basis identified by footnote in the ITU-R Radio Regulations.
 - Radio Navigation Satellite Service (RNSS) is allocated in the band on a Primary basis.
- Secondary services cannot cause harmful interference to primary services nor claim protection from primary services. (*RR articles 5.29 and 5.30*)
- In-country interference events have been observed, specifically to the GALILEO system. (In Germany and Italy).





23cm Band and Radio Navigation Satellite Bands

1164 MHz to 1610 MHz





RNSS systems and Amateur Band Plans







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Status of AI 9.1b prep work at October 2023

- The ITU-R Study Period is complete, there are no more Study Group or Working Party meetings before the WRC.
- Deliverables:
 - SG4/WP4C finalised ITU-R Report M.2513 which is now published.
 - CPM Report is available. This describes the issues and the study outcomes, the need for "measures" and the development of a "Guidance" Recommendation.
 - WP5A finalised the ITU-R Report addressing the review of the different systems and applications in the amateur services.
 - WP5A could not finalise the ITU-R Recommendation with no consensus on the recommended guidance and measures for amateur service operation.
 - The draft Recommendation referred to parent Study Group 5.



ITU-R Recommendation [Amateur Guidance]

- The "measures" intend to recommended parts of the 23cm band where interference to RNSS could be tolerated (system band edges).
- The "measures" intend to recommend specific amateur station power levels that could be tolerated by RNSS.

Why could consensus not be achieved?

- The GLONASS RNSS system operator insists that airborne RNSS receivers should be fully protected.....this....
-Leads to such stringent power limit proposals that **no amateur service operation would be viable**.
- The same RNSS system operator is concerned about regulatory ambiguity...
- ...and could find no measures in the draft Recommendation that protect RNSS.
- One Regional Organisation (CEPT) wants to mandate the measures rather than offer them as guidance to administrations.



ITU-R M.[AS.GUIDANCE] "Measures"





ITU-R M.[AS.GUIDANCE] "Measures"





ITU-R M.[AS.GUIDANCE] "Measures"





Relationship to the Radio Regulations

- An ITU-R Recommendation can be made mandatory by **incorporation** into the Radio Regulations **by Reference**.
 - Implemented with a footnote against the allocation in the allocation tables as a "shall" statement.
 - Several administrations and the amateur community are opposed as this is considered a disproportionate measure considering the (small) scale and national nature of the matter.
- If the Recommendation "fails" then it is possible a new WRC Resolution will be proposed.
 - This would also be a mandatory measure and contain a version of the technical measures laid out above.



Study Group 5 Plenary (September 23)

- The draft Report ITU-R M.[AMATEUR_CHARACTERISTICS] was approved for publication.
- The draft Recommendation was not adopted.
 - Despite 20 variations being developed "offline in the background", the same objections continued to be raised concerning the protection of RNSS.
 - The matter could be addressed in the "Radio Assembly" one week before WRC.
- This leaves uncertainty on the way forward for the WRC and the outcome.
 - A WRC Resolution (CEPT Proposal) could carry the technical measures and mandated in the Radio Regulations.
 - The existing Resolution 774 could be revised allowing further studies with a wider scope for WRC-27.





Summarising the "Measures"

- If the "measures" are reflected in national authorisations/licences:
 - Amateur activities would be confined to those identified parts of the band.
 - The remaining 53MHz (or 40MHz) of the band would be subject to such stringent conditions that no sensible operation would be possible.
 - Narrow band activities can continue in the top part of the band 1296 1300MHz with some constraints and power limitations (compared to where we are today).
 - For broadband applications (e.g. DATV) at least 3MHz may be available around 1257MHz also with power limitations.
 - Analogue TV may be not possible (depending on the outcome).
 - Current voice repeater shifts would be unusable (although wider split could be possible).
 - In band DATV repeater outputs may not be possible (except maybe in the UK with our extension to 1325 MHz).
 - Amateur satellite operation possible in 2MHz of the band with power limitations.

Situation at October 2023





- Uncertainty persists with just 36 days to go to the WRC-23!
- Now the "Radio Assembly RA" has come into the picture.
 - Radiocommunication Assembly is responsible for the structure, programme and approval of radiocommunication studies.
 - Approves and issues ITU-R Recommendations and ITU-R Questions developed by the Study Groups especially when related to WRC matters.
- WRC-23 deliberations may be dependent on the (if any) RA outcome.
- Several possibilities remain:
 - No change to anything in the Radio Regulations (RR), or a Recommendation incorporated by reference, or a WRC Resolution (to apply the measures) in the RR, or a new Resolution for new studies to WRC-27.
 - The IARU does not support any regulatory change to the RR that attempts to mandate the "measures" nor any extension of the work beyond WRC-23.

Meanwhile in Europe (CEPT Region)



- An ECC Decision is under development and this may also carry technical conditions applicable for the CEPT area that would likely be consistent with the ITU-R developments.
 - Likely to cover only 1256 1300 MHz part of the band like "alternative 1 or 2" above with no technical measures below 1256 MHz.
 - Development will continue through 2024 in ECC WG-SE and WG-FM.
 - For EU countries the "measures" could eventually become mandatory through an EC Decision.
- CEPT studies continue but have largely been overtaken by the ITU-R activity.



Best 73 from the IARU Team

