

## **[Draft] Wireless Institute of Australia Policy on Amateur Satellites**

### **Purpose**

The purpose of this document is to provide some guidance to the WIA Executive on making decisions when approached by organisations seeking WIA support or endorsement for their satellite mission and agreement for the use of amateur service frequency allocations for operation of satellites and associated ground control stations.

### **Background**

The amateur and amateur-satellite services are defined in the ITU Radio Regulations:

**1.56** *amateur service: A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.*

**1.57** *amateur-satellite service: A radiocommunication service using space stations on earth satellites for the same purposes as those of the amateur service.*

(With further details being provided in Article **25** of the Radio Regulations) The key characteristics of the amateur and amateur-satellite services are given in RR No. **1.56** and any satellite missions using amateur spectrum and operating under the amateur-satellite service must align with the spirit and intent of the definition above.

Satellites carrying amateur radio transponders, repeaters and a variety of digital platforms have been in common use since approximately 1970, however due to the rapidly decreasing cost of satellite hardware and greatly increased number of launch opportunities there has been rapid growth in the development, construction and launching of small satellites with no amateur component to the missions, many of which use various amateur frequency allocations for Telemetry, Tracking and Control (TT&C), and Earth-to-space and space-to-Earth communications. In common with many other national amateur radio societies the WIA has been approached to endorse satellite missions which do not fit within the clear definition of the amateur and amateur-satellites services given in the Radio Regulations and Australian Amateur Licence Conditions.

### **Mission categories**

Satellite missions may be categorised under three broad types:

1. 'Traditional' amateur missions which include transponders, repeaters, bulletin boards etc. on a satellite with no other mission components or with clearly separate non-amateur components which do not use amateur spectrum. In general support and endorsement of these missions would be readily provided.
2. Amateur-educational missions where there is some amateur interest, not necessarily involving two-way communications, AND includes some educational aspect OR which might provide useful technology for amateur missions. The educational aspect could be for engineers and scientists who would be exposed to the amateur service or some specific Science, Technology, Engineering and Mathematics (STEM) project to encourage people to enter a career in a STEM topic. If these criteria are met by the mission then endorsement and support may be offered,

3. Other missions which do not have any amateur, relevant technology spin-off, educational or STEM components. In general, such missions do not align with definition of the amateur and amateur-satellite services and endorsement or support would not be offered. Though negotiations may occur to make the mission fit within the amateur-educational category.

Some missions may be a combination of the above types and it important to ensure that some specific part of the mission has direct relevance to the amateur and amateur-satellite services if any mission endorsement is considered.

### **Decision points**

The following points should be considered when addressing requests for WIA endorsement or support:

1. The satellite mission MUST offer:
  - a. a clearly defined amateur component e.g. a transponder, APRS system etc. ideally the amateur component would be available on a global basis for 100% of the time, though geographically and time-restricted applications may be considered if sufficient reasons are provided.
  - b. OR some part of the mission must be relevant to possible future amateur satellite missions e.g. technology or system such as attitude control systems, power systems, communications systems etc. AND the results the study will be made available to the amateur community through open access publications or seminars etc.
  - c. OR some clearly defined STEM activity that clearly involves the amateur service AND with the potential to increase the number of licenced amateur operators e.g. satellite training courses that are operated by educational institutions, amateur radio clubs and societies, or by qualified amateur operators with a view to increasing knowledge of and interest in the amateur service,
  - d. OR some combination of the above components.
2. The satellite ground station must be operated by a licenced amateur operator with the appropriate class of licence.
3. The satellite mission and the licensee must have no pecuniary (meaning related to money or financial matters) interest. However, in the case of amateur-educational missions where teachers are involved and they are employed by the institution proposing the satellite, the fact that they are earning a salary as a teacher is not considered to be a pecuniary interest. Commercial missions using amateur frequency allocations must be opposed.
4. Except for telecommand signals from Earth to the spacecraft, no transmissions in amateur spectrum shall be encrypted or have its meaning obscured.
5. All information necessary to decode telemetry or other transmissions from the satellite to Earth must be publicly available and in a format that allows interested amateurs to receive and understand the transmissions.
6. There must be no inter-service communications e.g. amateur traffic being relayed on space operation service, fixed or mobile service frequencies and vice-versa. If proposed, this idea should not be supported.

7. The satellite must not already be launched, i.e. endorsement of a satellite which is requested post-launch must be declined.

If the mission is seen to meet the above requirement, and is in the general interests of the amateur service and the WIA, support and endorsement of the proposed mission may be given, otherwise it should be withheld.

#### **References**

- [IARU Amateur satellite reference and frequency coordination information](#)
- [IARU Satellite information paper](#)
- [ITU Radio Regulations](#)
- [Australian amateur licence conditions](#)
- [Guide to the use of ITU-R texts relating to the amateur and amateur-satellite services](#)
- [ITU Amateur and amateur-satellite service handbook](#)
- [Report ITU-R SA.2312-0 \(2014\)](#) Characteristics, definitions and spectrum requirements of nanosatellites and picosatellites, as well as systems composed of such satellites.
- [Report ITU-R SA.2348-0 \(2015\)](#) Current practice and procedures for notifying space networks currently applicable to nanosatellites and picosatellites.
- [RESOLUTION 642](#) Relating to the bringing into use of earth stations in the amateur-satellite service.

#### **Document History**

5/8/2020: Dale Hughes VK1DSH, initial draft version

11/8/2020: Minor revisions to original draft

oooOOOooo