The International Amateur Radio Union

Since 1925, the Federation of National Amateur Radio Societies
Representing the Interests of Two-Way Amateur Radio Communication

AMATEUR SATELLITE FREQUENCY COORDINATION REQUEST[1]

1.   Amateur-satellite service. Amateur stations meet the requirements of the radio regulations[2], RR 1.56. and 1.57.

> **RR 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 **[licensed]** persons **[individual natural people]** interested in radio technique solely with a personal aim **[for themselves]** and without pecuniary interest **[compensation]**. (NOTE: Explanatory terms in brackets are not part of the treaty text.)

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

Before asking for help from IARU with frequency coordination in the amateur-satellite service, make sure that your proposed operation meets the treaty requirements. NOTE: "Without pecuniary interest" means that you may accept free will donations of goods and services, that is, with nothing required in return. You may not sell services or data to anyone for any reason.

Ultimately, the decision of whether the proposed operation is appropriate for the amateur-satellite service rests with your country's administration (your national telecommunication regulator). Therefore, before sending your frequency coordination request to IARU, we suggest that you consult with your administration to determine whether the amateur-satellite service or another radiocommunication service is appropriate for your operation.

2.   Self coordination. For over 100 years, amateur radio operators have maintained an effective tradition of self-regulation. Amateurs are expected to coordinate their use of frequencies. (Nobody has any exclusive right to use any particular frequency.) Coordination of many terrestrial stations, repeaters and beacons, for example, usually works well through IARU member national societies and local coordinating committees.

Coordinating satellites. Amateur radio satellites present a special problem because satellites have global effect. Only a global frequency coordination system can work. Uncoordinated satellites will cause harmful interference to stations around the world and receive interference from them — which could result in mission failure.

Coordination serves everyone's best interests!

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[1] Terms used here are defined in the radio regulations and repeated in the IARU paper, *Amateur Satellites*. See:. http://www.iaru.org/uploads/1/3/0/7/13073366/iarusatspec_rev15.7.pdf
[2] The radio regulations are annexed to and part of a treaty, the International Telecommunication Convention, to which nearly every country in the world is a signatory party. See: http://www.itu.int/pub/S-CONF-PLEN-2011.

3. IARU Coordination procedure.

a) Frequency coordination for amateur radio satellites is provided by the IARU through its Satellite Advisor, a senior official appointed by the IARU Administrative Council, its top policymaking body. The IARU Satellite Advisor is assisted by an Advisory Panel of qualified amateurs from all three IARU Regions. (Similar to ITU Regions.)

b) It is a mandatory requirement for the IARU coordination that the licensing administration notifies the ITU with the selected frequency assignments/bands for the proposed satellite (ref RR Article 9, sub-section IA[3]). The licensing administration files the Advanced Publication Information (API) with ITU. This should preferably be done prior to the actual frequency coordination by IARU. As a response to this submission, the ITU will assign a special section number (API/A). This API/A special section number must be provided in field 1d of the Frequency Coordination Request form. If this information is not available when the IARU Frequency Coordination Request is filed, please provide the date that you submitted the API information to your administration. Usually an API special section publication appears within two to three months after its submission to ITU. It is important that you encourage your national administration to forward their notice to ITU as early as possible.

Note that for the amateur satellite service, ITU offers this registration without any fee of cost recovery.

c) It is important that all satellites operating in the amateur satellite service are registered with ITU in order to obtain international recognition, something that demonstrates the relevance of the amateur satellite service and protects its frequency allocations. IARU therefore strongly recommends that you work with your national administration and encourage them after the API submission to continue with the submission of the Notification form of notice of the satellite stations when they are brought into use (RR Article 11.2). Assistance with the notification process is provided on the ITU web.

4. Getting Help.

a) **Start** by reading *Amateur Radio Satellites*, which is an IARU paper. You will find explanations and interpretations of Treaty provisions. IARU satellite frequency coordination follows these interpretations. Download the latest version from: http://www.iaru.org/amateur-radio-satellite-frequency-coordination.html

b) **Discuss** your project with the national amateur radio society of your country and your national AMSAT organisation, if there is one. They may be able to assist you in a variety of ways.

c) **Use information** available on-line.

i. For a list of national amateur radio societies (Member Societies of IARU), see: http://www.iaru.org/iaru-soc.html.

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[3] This applies to non-GSO amateur satellites only. For GSO satellites contact the IARU Satellite Advisor for further guidance.

ii. For a list of amateur satellite organisations, see: http://www.amsat.org/amsat-new/links/.

iii. A link budget spread sheet is at: http://www.amsatuk.me.uk/iaru/spreadsheet.htm

iv. Check frequencies of currently operating satellites at: http://www.amsat.org/amsat-new/satellites/. Check on coordinated and other planned amateur satellites at: http://www.amsat.org.uk/iaru/.

v. If you need help understanding the requirements or completing the coordination request, ask the Satellite Advisor or a Panel Member.

5.   When to make the frequency coordination request. Make your frequency coordination request as far in advance as possible. Remember, coordination takes account of your own needs and the needs of others. Receiving coordination early enough makes design and construction easier and less expensive. In any event, be sure to make your request while it is still possible to change operating frequencies in response to the Satellite Advisor's recommendations. A good moment to submit your coordination request would be right after you have done your preliminary Design Review.

6.   Who makes the frequency coordination request? The prospective space station licensee must make the coordination request, as that person will be responsible for space station transmitter operations.

7.   Where to send your frequency coordination request. Send frequency coordination requests to the IARU Satellite Advisor by e-mail to satcoord@iaru.org. You should get an acknowledgement that the request has been received within a week.

8.   What will happen? The IARU Satellite Advisor will make recommendations to the licensee concerning plans based upon all available information and advice from the Satellite Advisory Panel. His goal is to help you and your project to succeed. The current status of your request will be published through the link at http://www.iaru.org/satellite or at http://www.amsat.org.uk/iaru. When the process is complete, the licensee will receive a coordination letter with detailed information. Visit also www.iaru.org for information about the IARU and its activities.

VERY IMPORTANT!

CHECKLIST:

1. ☐ **NAME THE ELECTRONIC DOCUMENT** you submit with the name of the proposed satellite followed by the submission date.   Example: if the name before launch is NewsatA and the document is submitted on 1 August 2017, the document file name should be: "newsata_req 170801.doc."

2. ☐ **LARGE FILES** should **NOT** be in the request form. **INDICATE** URL's for pictures, sketches, drawings, and other pertinent information.

3. ☐ **INDICATE** in box number 11 whether or not you feel that the proposed operation in the amateur-satellite service is consistent with the radio regulations as interpreted by the IARU Satellite Advisor. If not, please, explain your interpretation of the radio regulations. Tic only ONE box.

4. ☐ **LICENSEE** must sign and date the form in box number 12. The document may be submitted as pdf.

THE FORM

Make sure to complete the coordination request. Below is additional explanation to assist you.

0 Document Control

0a Date format to be used DD-MMM-YYYY e.g. 01-Aug-2017

0b Start with 0. Next version will be 1

1 Spacecraft

1a Name of the spacecraft as in your API

1b Notifying administration: This is the administration that submits the API. In most cases the same administration that issued your amateur license.

1c API/A number: The Advance Publication Information number is assigned by ITU/BR *after* your administration submits RR Article 9 notification information. If the API number is not known provide the date on which the information was sent to your administration.

2 Licensee

This should be self explanatory

3 Organisations

3a Name of organization: Not for individual amateurs. Use only if the satellite is built and launched by a radio club, university, school etc.

3g and 3h Your national amateur radio society and AMSAT organization may be able to help determine if the operation qualifies for the amateur-satellite service and to provide practical information.

4, 5 and 6 spectrum related items

4a Tick the box(es) to indicate if your mission is amateur or educational. Amateur missions will fully comply with articles 1.56, 1.57 and 25 of the Radio Regulations. If educational and university satellite projects are not licensed as amateur stations theymay be coordinated only when there is an identified amateur component and the mission is to teach and train students in satellite communication and building and launching satellites. The person responsible for the satellite communications must be a licensed radio amateur.

4b Mission(s) and frequency band(s*)*: Specify in which bands the various missions operate (including non-amateur missions)

4d1, 4e1, 5a1 and 6a1: Frequencies numerically in MHz or GHz. You can either request for a specific frequency or the number of frequencies required. Note that the panel can not always follow your request.

Repeat these lines as many times as necessary. E.g. 4d1:

  Freq 1. 436.500 MHz - Beacon and payload data
  Freq 2. 436.600 MHz - FM Repeater Downlink

4d2 and 4e2: Tuning range of transmitter and step increment. This will help to pick a frequency.

4d3 EIRP: Effective isotropic radiated power in watts

4d4, 4e3, 5a2 and 6a2: ITU emission designators are explained at http://www.iaru.org/satellite. Effect of Doppler shift is NOT included when determining bandwidth. If using a frequency changing transponder, indicate the transmitting bandwidth.

4d5, 4e4, 5a3 and 6a3: Common emission description means terms like transponder, NBFM, PSK31, 1200 baud packet (AFSK on FM), etc

4d8 Service Area: This is ITU terminology. The service area specifies whether the space station only transmits when visible from the notified service area. (e.g. worldwide or a specific coutry)

4e5 System noise temperature in K° when looking at the Earth

4e6 Antenna gain in dBi and pattern, with or without attitude control

4f Physical structure: Give a general description, including dimensions, mass, antennas and antenna placement, whether stabilized or tumbling, etc. Give URL's for drawings. Basic description or URL linking to specific detailed information. Make sure the link works for public access.

4g Functional Description: Describe each sections function within the satellite. Give a basic description or URL linking to specific detailed information. Make sure the link works for public access.

4h Power budget: Describe each power source, power consuming section, power storage, and overall power budget. Give a basic description or URL linking to specific detailed information. Make sure the link works for public access.

5a4, 6a4 and 8b link budget(s): Show link budget or URL linking to specific detailed information. Make sure the link works for public access

5a5 A general description of any cipher system. Show description of cipher system to protect telecommand signals

5b Positive space station transmitter control. Explain how telecommand stations will turn off the space station transmitter(s) immediately, even in the presence of user traffic and/or space station computer system failure. ITU Regulations require this. See RR 22.1: Space stations shall be fitted with devices to ensure immediate cessation of their radio emissions by telecommand, whenever such cessation is required under the provisions of these Regulations

5c. Telecommand stations.: List telecommand station(s). callsign and physical location (address or lat/lon). Repeat in case of more than one telecommand station

5d Optional: Give the complete space station turn off procedure. As a service, the IARU Satellite Advisor will keep the space station turn off procedure as a backup for your operation. Only the space station licensee may request the information. If interference occurs and the licensee cannot be located, the licensee grants the Satellite Advisor permission to use the turn off procedure. Please note that the Satellite Advisor will use his best efforts, but cannot guarantee success. The space station licensee is still held responsible for the space station transmitter(s) by the licensing administration.

6b Transmission Formats: Please provide a HTTP URL with the descriptions for the protocols and formats used for all radio transmissions from the satellite (including the protocols and formats for beacons, telemetry and data transmissions) in order to enable amateur radio operators to receive and decode the transmissions. For telemetry, please include the equations necessary to convert the raw values to engineering units. If the formats are not 100% known at the present time, please provide just the URL, but make sure the final information is published in the provided URL. Be sure to read: RR 25.2A. Text is included in the paper available at:http://www.iaru.org/satellite/sat-freq-coord.html. "