Ground Terminal Competition

Handbook

Revision History

Version	Description	Date
v1.0	Initial document creation	24/01/2024

1. Introduction

The BIRDS-X Project proudly announces the Ground Terminal Competition, presenting an opportunity for anyone to demonstrate their expertise and propel the frontiers of satellite communication. The competition is open to any amateur radio license holder. We invite you to upgrade/update your amateur radio station or build your ground terminal to perform satellite communications using amateur radio bands. The competitors can transmit and receive messages via the Automatic Packet Report System (APRS) repeater installed onboard the Dragonfly satellite. This process of sending and receiving information packets is known as “digipeating.”

What is Dragonfly?

Dragonfly is a 2-unit (100mm x 100mm x 227 mm) satellite developed at the Kyushu Institute of Technology as part of the BIRDS-X Satellite project. Dragonfly will be launched in 2024 to provide amateur radio services and collect data to demonstrate cutting-edge technologies in telecommunications for future space missions.

2. Objectives

Increase the users of the amateur radio community by communicating with a 2U APRS mission CubeSat, as well as helping people to get involved in satellite communications in amateur radio bands, resulting in the improvement of technical skills and democratization of space.

3. Competition Schedule

Date	Action
January 2024	Call for Participation
September 2024	Application Deadline
May 2024	Handover of satellite to JAXA
September 2024	Release of the satellite from ISS
October – November 2024*	Competition period
December 2024*	Results Announcement

*To be updated later

4. Operation frequency.

The frequency for sending and receiving the APRS packets on VHF (Very High Frequency) will be announced as soon as the satellite is fully operational.

5. Categories

The competition will be divided into categories based on the power output in the transceiver used by the participants and declared in the competition form.

Categories	**Power output**
Low	5 W
Medium	15 W
High	25 W

6. Scoring points

For every contact confirmed with the satellite, 1 point will be scored, and extra points will be added based on the equipment information provided to the BIRDS-X Team on the competition website form.

Every contact confirmed will be awarded 1 point.		
Antenna Type	Omnidirectional	x2
	Directional (with tracking system)	x1
	Fixed	x1
Station Type	Mobile	x2
	Handheld	x5
Elevation Angle	Over 60 deg	x1
	Between 20 deg to 60 deg	x2
	Less than 20 deg	x3

Example:

Omnidirectional	1 x 2 = 2 points
Mobile	1 x 2 = 2 points
Over 60 deg	1 x 1 = 1 point
Total points scored	5 points

7. Station setup

We provide a schematic of a ground terminal setup with the components required to perform communications using APRS, but since there are many types of components and their combinations able to perform the same task. ***This schematic must be considered for reference purposes and is not mandatory for the competition*.**

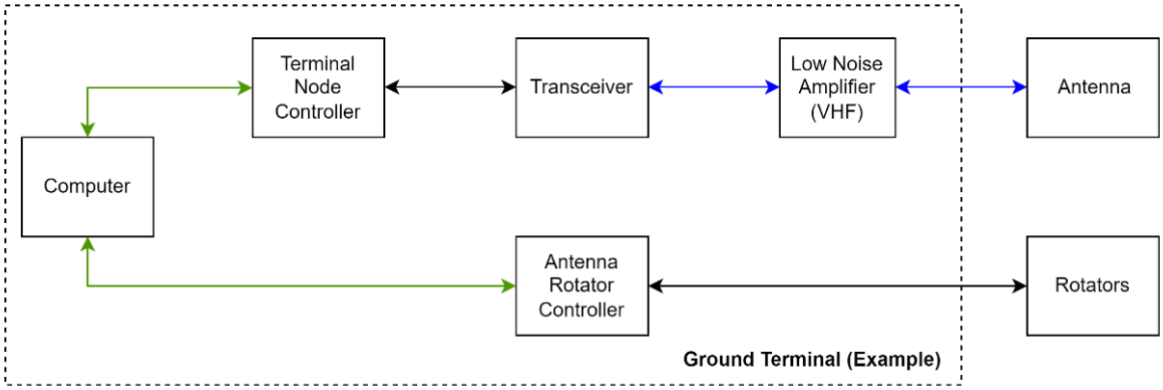

Figure 1. Ground Terminal Schematic (Not mandatory)

8. Competition application

The competition application will be completed by filling out the form on the BIRDS-X Project's official website or scanning this QR code.