**Item Name : DRAGONFLY**

**<CubeSats Description (in English)>**

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| **●Mission**  *(Purpose ,*  *Mission period,*  *Operation outline, etc)* | BIRDS-X project is a 2U CubeSat dedicated to amateur radio communication. Our stakeholders are Kyushu Institute of Technology (Kyutech) and the Association for Radio Digital Communications (ARDC). The goal of our project is to bring diversity to the space sector and democratize the usage of space.  • Alternative UHF TRX The objective is to develop and demonstrate an alternative UHF TRX for CubeSat that offers comparable performance, data rate, and low power consumption as the existing commercial one. Our proposed TRX costs approximately 300 USD, thus providing a cost-effective solution for future CubeSat projects, ensuring reliable communication capabilities while minimizing financial constraints.  • Volcano Monitoring (APRS-R) This mission aims to operate the APRS Reference payload in the store-and-forward mode to carry the acquired data from the remote volcanic area and observe and monitor the volcanic activity by analyzing the collected data through the satellite.   • APRS Payload competition (APRS-P) The objective of this mission is to increase the users of the amateur radio community by providing APRS payload slots, as well as helping people to get involved in the creation and operation of that payload, resulting in the improvement of their technical skills and democratization of space. The ground terminal used for APRS was selected through a contest. With various configurations, conditions, and hardware, the APRS payload in BIRDS-X will be thoroughly tested. |
| **●Size**  *(multiple of 1U size. If multiple satellites　are in scope of a single SAR, also indicate how many)* | **Size: 2U:**  **Number: 1** |
| **●Orbital Lifetime** | **(Less than) 2 years** |
| **●Dimension(mm)** | **Stowed Config. :**  **104 x 112.34 x 227 mm**  **Deployment Config.** *(If applicable)***:**  **712.25 x 112.34 x 760.94 mm** |
| **●Mass(kg)** | **Less than 2.66 Kg (per 1 ea)** |
| **●System Overview**  *(Include CubeSat*  *picture)* | **Check the box, if applicable.**  **(***If one of check boxes is* ***checked*** *for all categories, this item may qualify as  NASA / JAXA Franchise Criteria (FRC) “1”.)*   1. Deployment mechanism   *No items to deploy*  *Only simple antenna(s) and/or paddle(s) are deployed, whose controls meet any one of the conditions in (\*)*  *(\*)*  *1. Meet the JSSOD ICD to preclude deployable from sticking inside JSSOD.*  *2. Perform a Deployment Demonstration Test. Unique HR will be created.*  *3. Have redundant burn wires and 3 inhibits, Unique HR will be created.*  *For all the other cases, list Item(s) to be deployed:*  **ここをクリックしてテキストを入力してください。**   1. Battery   *Type :* **Ni-MH battery(Panasonic BK3MCC)**  *Capacity :* **14.4 Wh**  *No batteries over 80Wh*   1. Capacitor   *No super capacitor, or capacitor used as a temporary/  alternate power source*  *Capacitor (if used as a temporary/alternate power source)*  *~ Continued from previous Page ~*  *Type :* **ここをクリックしてテキストを入力してください。**  *Capacity :* **ここをクリックしてテキストを入力してください。**   1. Maximum RF radiation source   *No RF radiation source*  *Comply with criteria (\*\*)*  *Non-comply with criteria (\*\*) and*  *3 deployment switches for RF*  *(One inhibit needs to be in the return leg).*  *(\*\*) OE-14-002, JX-ESPC-101132 and SSP50005*   1. No high energy source *(such as high voltage source over 32V, 　 pressure vessel, pyrotechnics, etc.)* 2. No propulsive system 3. Jettison Policy *Comply with all the following EAC (Expedited Approval   Criteria) defined in PPD1011 Revision C  Note: If satellite does not meet 2 or 5 below, additional   data submittals are required. (See Attachment A)  1. Satellite has a cross sectional area on each of its three  orthogonal sides greater than that of a sphere with a diameter   10 cm (78.5 cm2).*  *2. Satellite is 3U in size or smaller with orbital lifetime less than  25 years.*  *3. These aspects of the jettison have previously been analyzed   and approved:   - Location and direction  - Deployer mechanism and speed  - Size and mass within deploy mechanism parameters*  *4. Satellite has an operational Ballistic Numbers which meets  criteria.*  *5. Satellite does not have features that significantly change its  trajectory or trackability..* 4. Deployer   *Deploy from JEM (not from H-SSOD)*   1. Laser   *No laser*  *Laser, whose controls meet either one of the conditions in (\*):*  *(\*)*  *1.* *Verify with OE1298(V-47 or V-48 for NASA Form 1298/* *V-7.1(a)o*r *V-7.2(b) for JAXA Form 1298)* *for Class1 or 2 laser.*   1. Visible LED   *No LED*  *LED (=< 10,000nits)*  *LED ( > 10,000nits), controlled by 3 inhibits for lighting (One inhibit needs to be in the return leg) or fully contained.*   1. Wire/Cable Sizing and derating   *Comply with Technical Memo: "Checklist for the JAXA Battery powered Payloads”.*   1. CBCS (FRC2 coordination is needed until nominal delegation)   *No CBCS*  *The hazard falls under FRC1 criteria (i.e. complied with the above condition) and CBCS is used for a single control of the hazard (Only General Req. of SSP50038C is applied)*   1. Items other than the above   *Comply with FRC1 criteria of NASA/JAXA JOP(JSX-2013021)*  Overview of Satellite before deployment    External View (Deployed Configuration)    **Z**  **-Y**  **-X**  Internal of Satellite  時計, ブルー, 飛ぶ, 大きい が含まれている画像  自動的に生成された説明  Antenna Arrangement |
| **●Remarks** | **DRAGONFLY uses 145.825 MHz VHF (uplink and downlink). It also uses 435.313 MHz and 437.375 MHz UHF for uplink and downlink respectively.   Transmission frequency:  145.825 MHz and 437.375 MHz.   Transmission output power :   0.5 Watt for 145.825 MHz  0.8 Watt for 437.375 MHz   Antenna gain : 0.5 dB (UHF) Antenna gain : 2.0 dB (VHF)** |
| **FRC classification**  **(classify by JAXA SRP)** | ***CubeSat FRC :*****FRC1**  *FRC classified outside the checklist above:*  *FRC3 :* **ここをクリックしてテキストを入力してください。**  *FRC2 :* **ここをクリックしてテキストを入力してください。**  *FRC1 :* **BIRDSX-SAR-01** |

**Attachment A: Verification required in PPD 1011 Rev. C**

**For CubeSat that is larger than 3U in size or has its orbital lifetime with more than and equal to 25 years** **to meet Requirement 4.1-2: Limit Generation of Orbital Debris**

1. *Payload developers shall provide an EOM passivation plan to NASA explaining planned methods of fragmentation/orbital debris generation risk mitigation for the post-mission orbital lifetime.  
   or  
   Refer to NASA–STD-8719.14 for verification analysis details. The internal NASA standard for accepting no further mitigation of fragmentation risks is a maximum 1/1,000 chance of fragmentation over the remaining life.*  
     
   Attach EOM (End of Mission) passivation plan or design analysis that verifies the risk of on-orbit fragmentation is acceptable.

**For CubeSat that is capable of transitional maneuvering to meet Requirement 4.2-1: Data Sharing and/or Requirement 4.2-2: Responsible and Safe Space Operator**

1. *Payload developers will provide to NASA proof of an SSA Sharing agreement with USSPACECOM. Details on registering satellites can be found at space-track.org*  
     
   Attach proof of an SSA (Space Situational Awareness) Sharing agreement with USSPACECOM.
2. *Documentation (such as Payload Integration Agreements (PIA), Operations Interface Procedures (OIP), Operations Agreements (OA), etc.) will be signed by the satellite missions operations team and NASA with the necessary data exchange details, including notifications, expectations, results for on-orbit tests and translational maneuvers, trajectory data, and points of contact.*  
     
   Attach documents (such as Payload Integration Agreements (PIA), Operations Interface Procedures (OIP), Operations Agreements (OA), etc.) for data exchange process with TOPO.
3. *During the Safety Review process, the propulsive candidate must provide a plan to demonstrate the Responsible and Safe Space Operator criteria on orbit. Following the first on orbit maneuver, satellite operators will provide NASA TOPO with proof that the satellite has met the aforementioned criteria to be considered a Responsible and Safe Space Operator.*  
     
   If needed, attach a plan to verify the Responsible and Safe Space Operator (RSSO) criteria on orbit. (If there is no plan, operation is subject to go/no go requirements from TOPO.)  
     
   *Note: After the plan for RSSO criteria is submitted to NASA through this FRC Format, the data exchange and coordination between NASA and RSSO will be conducted directly by contacting with each other.  
     
   RSSO Point Of Contact*

*Name:*

*Email Address:*