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DEMOCRATIZING SPACE: CONCLUSION AND LESSONS LEARNED FROM THE BIRDS-X APRS  
PAYLOAD COMPETITION.

## Abstract

This study outlines the conclusions and lessons learned from the BIRDS-X APRS Payload Competition to be flown on the Dragonfly CubeSat. The mission has two objectives: fostering global engagement in the Amateur Radio community and advancing APRS technology in space. The three-phase competition culminated in the selection of five outstanding payload designs, which were given the opportunity to participate in the BIRDS-X project. Payload boards were received from the participants working from their countries of origin. The final selection was made based on compliance with the ICD and general performance. Following the rigorous evaluation, 11 teams from 10 countries advanced to the Engineering Model (EM) development stage, demonstrating the feasibility of their APRS payloads, and five teams went to the Flight Model (FM) stage. Following release from the International Space Station, the payloads will undergo performance evaluations focusing on their transmission and reception capabilities. The assessment will utilize the APRS beacon and digipeating functions, with data collection occurring during satellite passes using the APRS store and forward capabilities. Dragonfly's two APRS reference boards will facilitate ground-based testing to complement the payload competition. This paper discusses the overarching goal of democratizing space through community involvement and technical skill enhancement. The study underscores the successful execution of the BIRDS-X APRS Payload Competition, emphasizing the lessons learned for future competitions focusing on rideshare and technological advancements in space amateur radio communications.