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National Aeronautics and  
Space Administration



## TECHNOLOGY SOLUTION

**Aerospace**

# Novel Antenna Concept for CubeSat Platforms

An antenna is embedded into the structure of a Cubesat providing robust communications with reduced weight and mass.

Current Cubesat antenna technology requires packaging during the launch and deployment mechanisms during orbit. This packaging and deployment hardware adds extra volume, weight and complexity to a payload. Additionally, there is a risk of deployment mechanism failure. By integrating the antenna into the structure of a Cubesat, the need for extruding antennas, packaging considerations and deployment mechanism are eliminated. The resulting antenna has reduced weight and volume and increased dependability.

### BENEFITS

- Higher reliability
- Lower weight and mass



## THE TECHNOLOGY

The side walls and railing rods of a CubeSat are replaced by RF radiators that double as supporting structures. The RF radiators are hollow railing rods with inner dimensions that function as a waveguide to carry RF energy at a desired frequency. Radiating slots are cut on two of the four sides of hollow tubes that are open to outside environment. Different operating frequency antennas may be placed at each of the Cubesats four corners. Thus the railing rods provide RF antenna functionality in addition to structurally supporting the CubeSat structure.

While this technology was designed for Cubesats, it may be utilized in any technology that utilizes a structural frame. The advantages of this system are increased reliability due to the elimination of deployment mechanisms and decreased payloads. Higher frequency antennas with increased gain and directivity may be embedded into the rails. These higher frequencies are especially useful for remote sensing.

## APPLICATIONS

The technology has several potential applications:

- Drones
- CubeSats

## PUBLICATIONS

Patent No: 10361472

## More Information

National Aeronautics and Space Administration

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