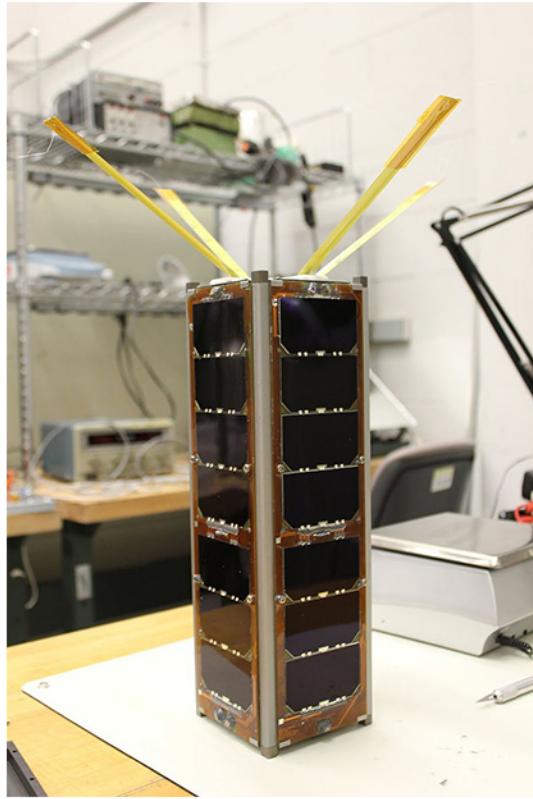


RAX-2 (Radio Aurora Explorer 2)



RAX-2 (Radio Aurora Explorer 2) is a CubeSat satellite built as a collaboration between SRI International and students at the University of Michigan College of Engineering.

With the exception of the solar panels, the designs of RAX-1 and RAX-2 are largely identical. RAX-1 and RAX-2 are standard 3U CubeSats with physical dimensions of approximately 10 cm x 10 cm x 34 cm and approximate mass of 3 kg. The satellites conform to the 3U CubeSat standard such that they can be launched from the Cal Poly P-POD, a specialized container and deployment mechanism by engineers at Cal Poly San Luis Obispo that many launch providers are able to attach as secondary payloads to their launch vehicles.

The primary mission objective of RAX-2 is to study large plasma formations in the ionosphere, the highest region of our atmosphere. These plasma structures, a form of turbulence called field-aligned irregularities (FAIs), can distort communication and navigation signals such as global positioning systems (GPS).

To study FAI, the RAX mission will utilize a large incoherent scatter radar in Poker Flats, Alaska (known as PFISR). PFISR will transmit powerful radio signals into the plasma instabilities that will be scattered into space. During that time, the RAX spacecraft will be orbiting overhead and recording the scatter signals with an onboard receiver. These signal recordings will be processed by an onboard computer and transmitted back to our ground stations where scientists will analyze them. The goal of this one-year science mission is to enhance our understanding of FAI formation so that short-term forecast models can be generated. This will aid spacecraft operators with planning their mission operations around periods of expected communication disruption.

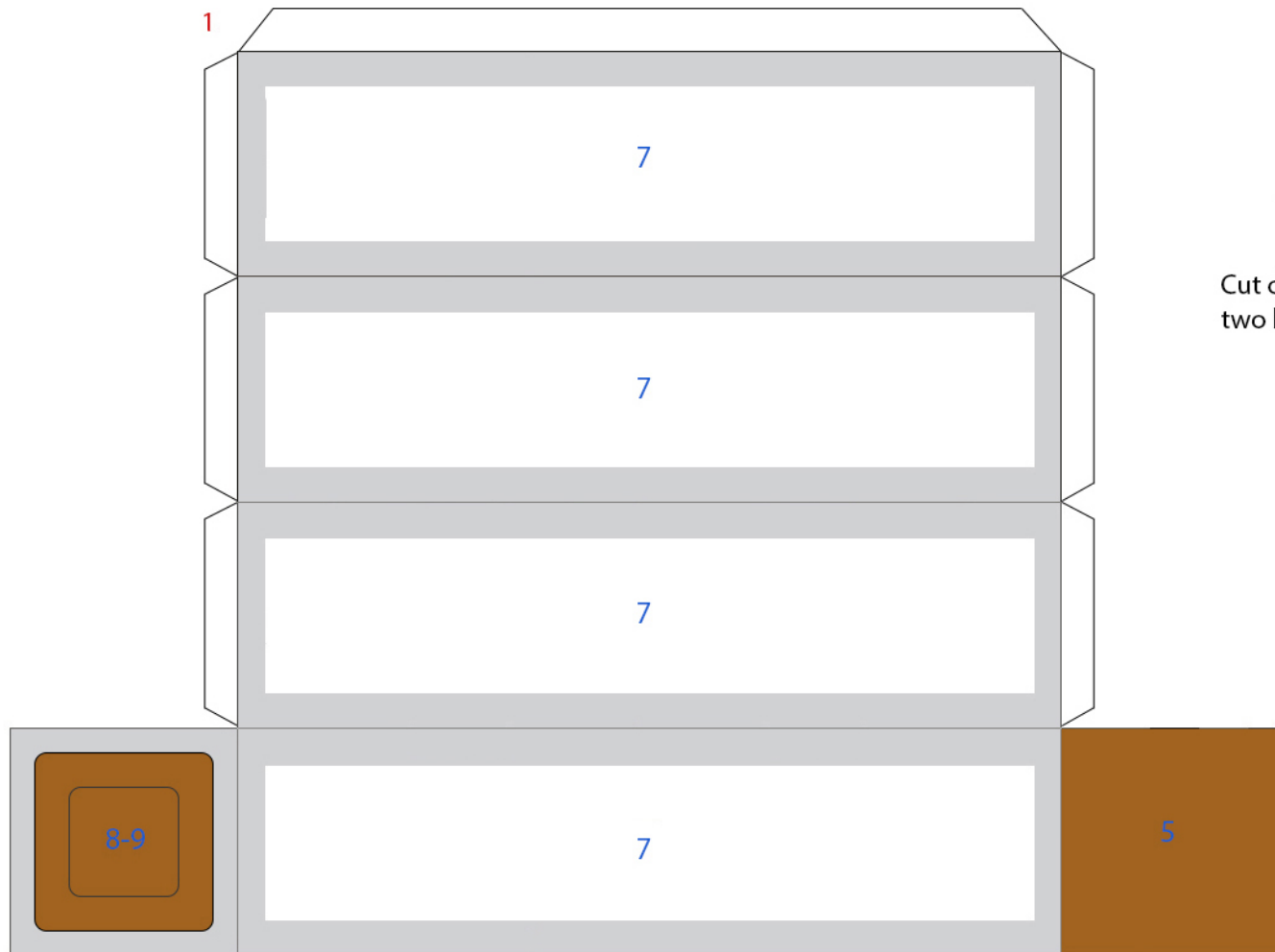
RAX-2 successfully made the first-ever measurement of naturally occurring auroral turbulence recorded using a nanosatellite radar receiver. The distinctive radar echoes recorded on March 8 were taken with the Radio Aurora Explorer (RAX) CubeSat. The RAX nanosatellite measured turbulence over Fairbanks, Alaska that was a direct result of a geomagnetic storm triggered by the largest solar flare in the past five years. The Earth's high latitude ionosphere, a region of the upper atmosphere associated with solar-driven aurora or "northern lights," becomes highly unstable when large currents flow during geomagnetic storms. RAX was specifically designed by SRI and the University of Michigan to measure this auroral turbulence from an orbital vantage point inaccessible to traditional ground-based radars.

The RAX radar echo discovery has convincingly proved that miniature satellites, beyond their role as teaching tools, can provide high caliber measurements for fundamental space weather research.

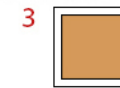
RAX-2 was launched from Vandenberg Air Force Base in October 28, 2011 atop a Delta II rocket. The CubeSat launch was sponsored by NASA as part of the ELaNa-3 program.



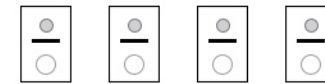
RAX-2 (Radio Aurora Explorer 2)



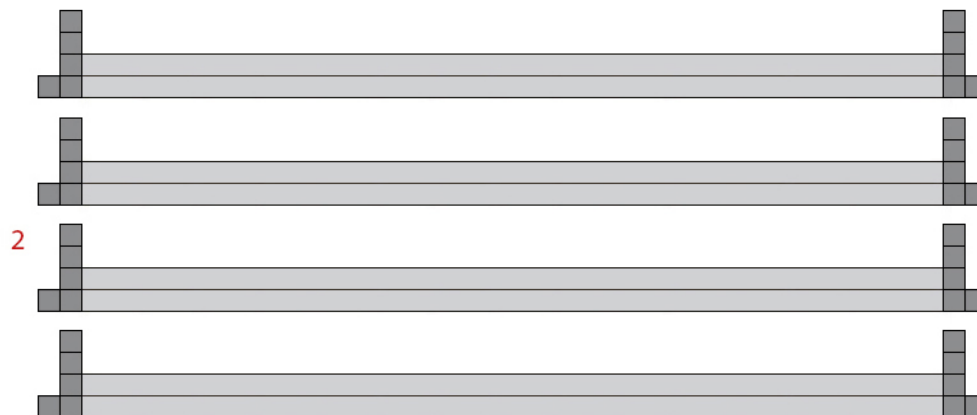
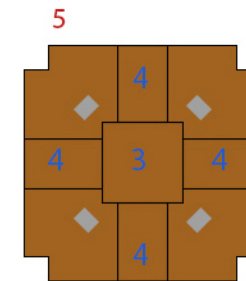
Glue to cardstock



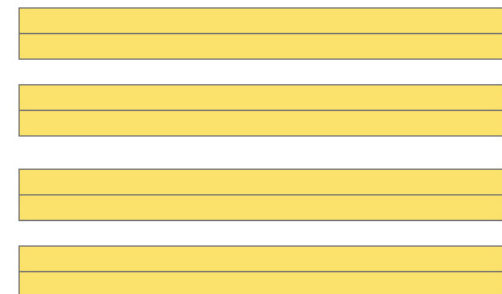
4



Cut out the black line, then glue to two layers of cardstock.



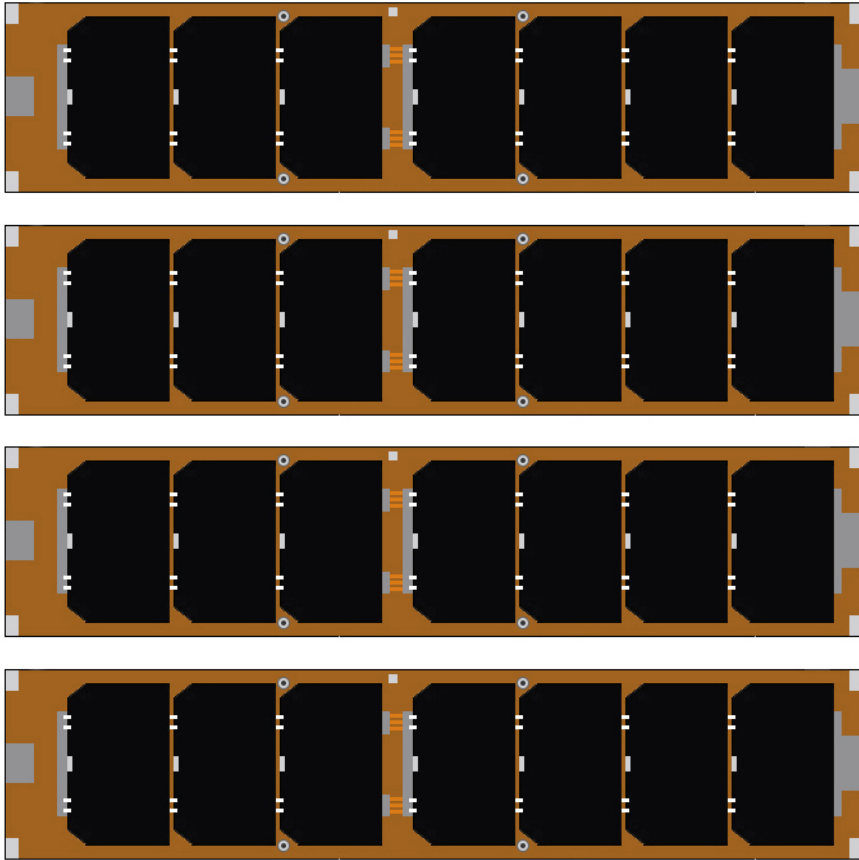
6



RAX-2 (Radio Aurora Explorer 2)

7

Glue to cardstock



8



9



Wrap 9 around the outside of 8.

Optional Detail parts

