

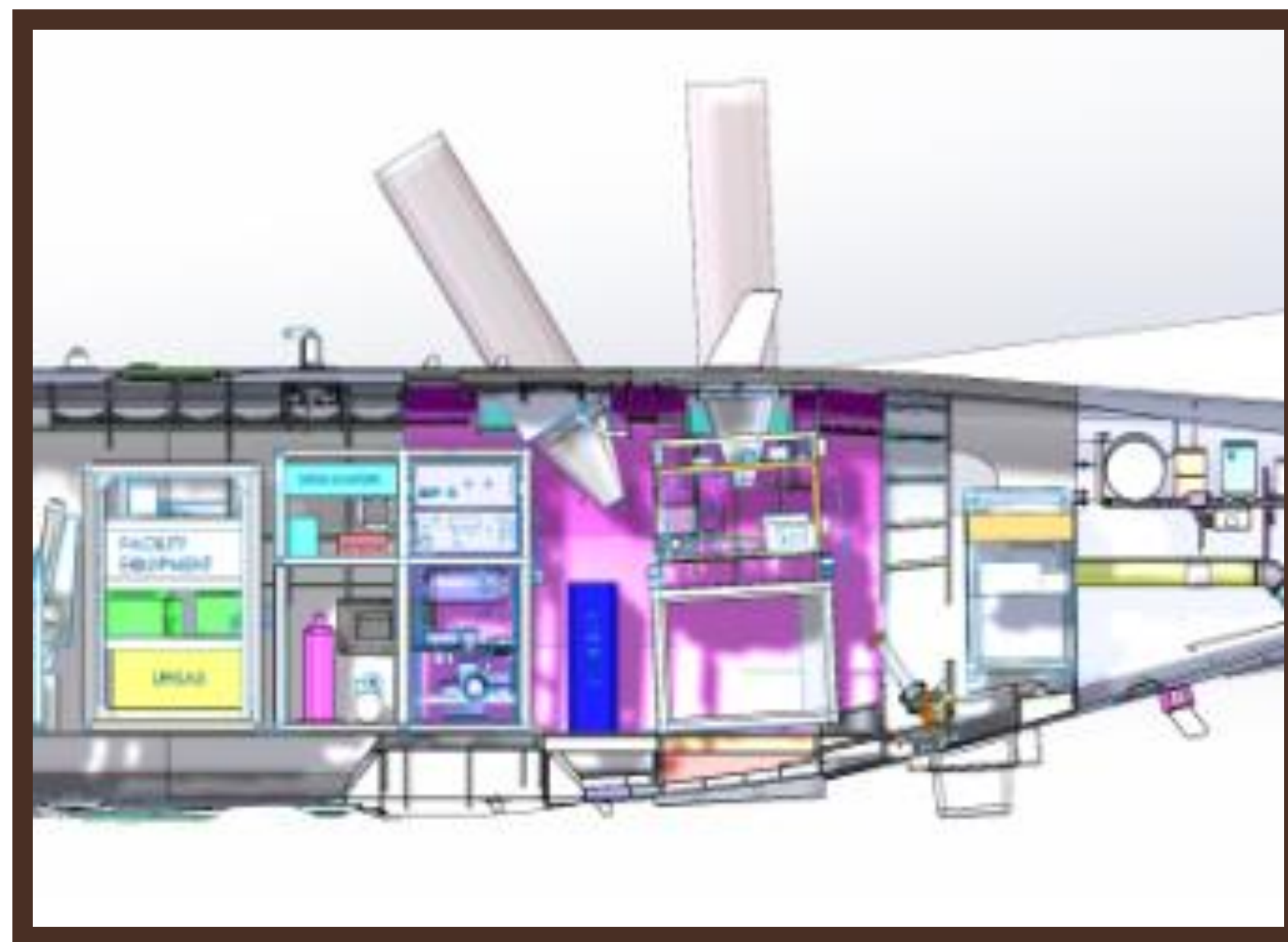
Wyoming Cloud Radar 4 Upper Antenna Mounting

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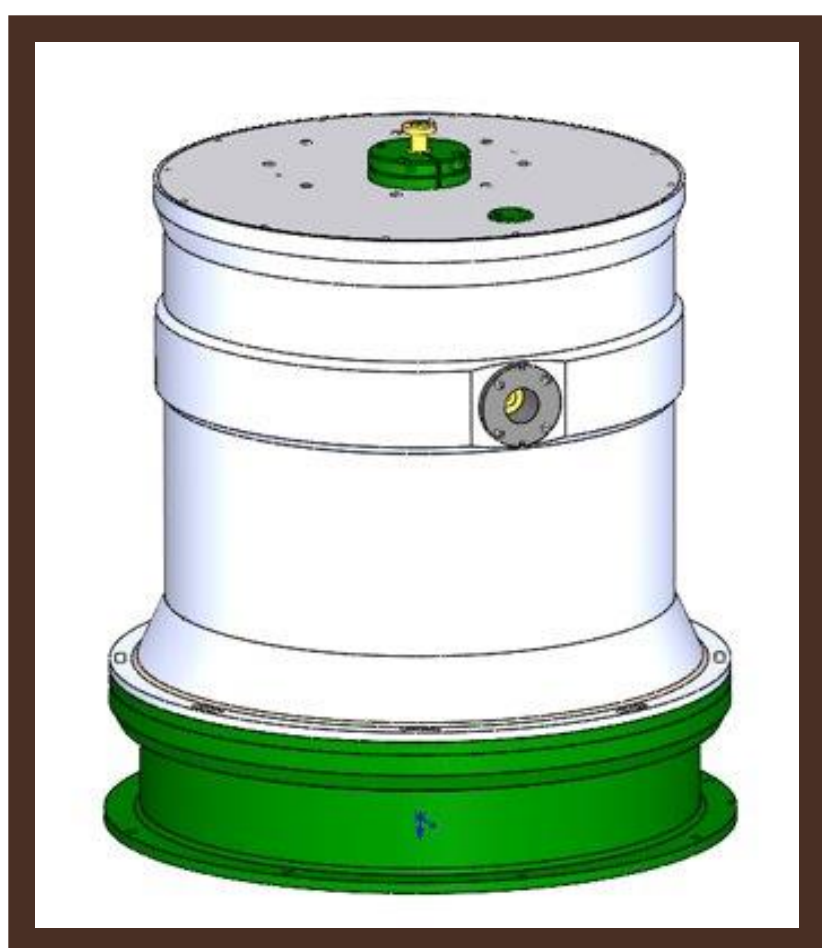


Project Description :

The Atmospheric Science Department requires installation of the Wyoming cloud radar 4 on the new King Air 350i Research Aircraft to support scientific missions for the National Science Foundation. Two teams have been developed to take on the separate tasks of the upper and lower antenna mounting brackets.



Pictured left:
The midsection of the plane where the upper antennas will be mounted (zenith & zenith slant).



Pictured left:
GOLA antenna, which is to be mounted only on the zenith slant port.

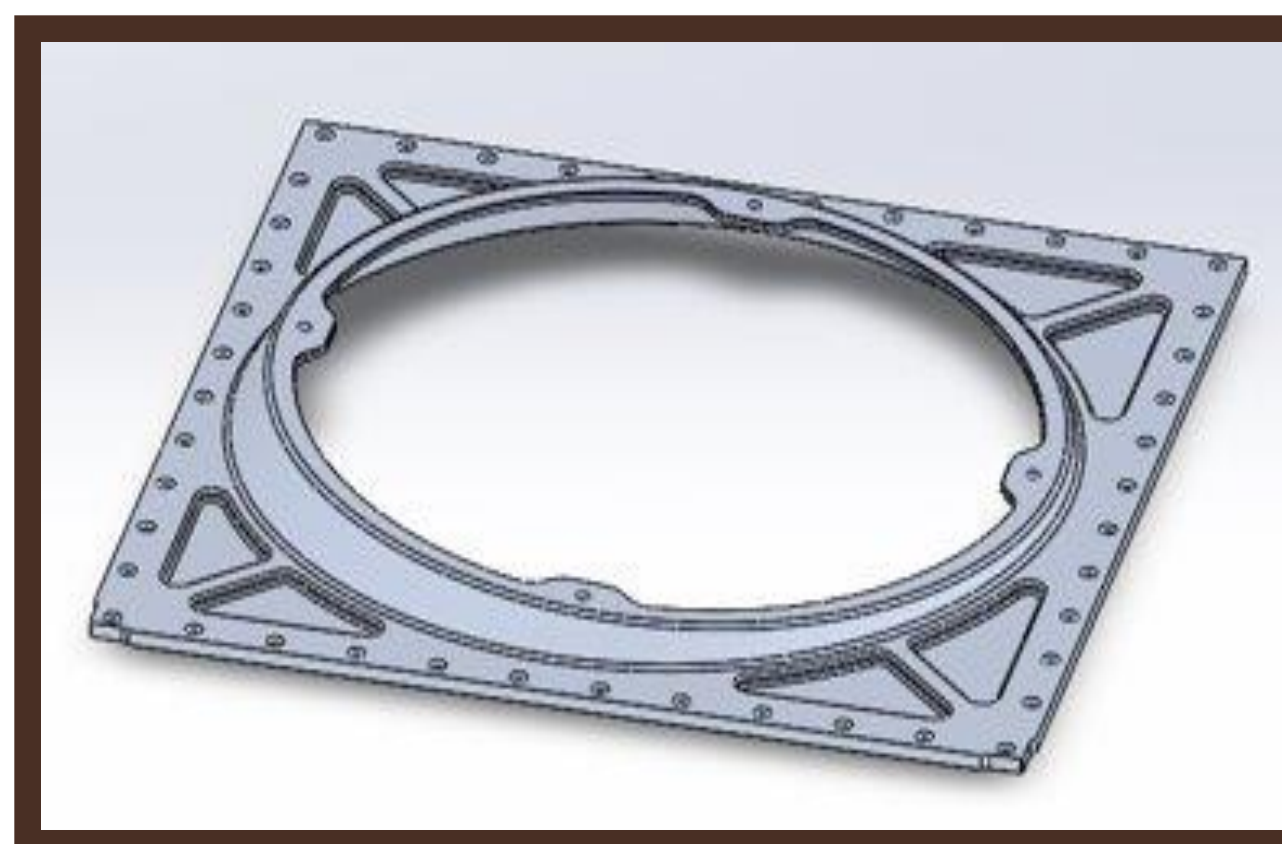
Design Requirements :

This project will be mounted inside an aircraft; all applicable Federal Aviation Administration (FAA) standards must be met. In addition to the FAA regulations the client also has specific requirements:

- Withstand a forward force of 9gs of acceleration
- Removable for different future missions
- Zenith slant mount able to accommodate both the GOLA and conical horn antenna for mounting



Pictured Right: Conical horn antenna, which is to be mounted on the zenith and zenith slant port.



Pictured Left: Zenith mount (3 degrees of forward slant).

Current progress :

The team currently has one approved design (zenith) and one design in progress (zenith slant). Due to considerations of stray radiation the zenith slant is proving to be difficult as the machining process is laborious. The teams next goals are refining the zenith slant with advice from the client as well as initial finite element analysis (FEA) and stress hand calculations.

Pictured Right:
Zenith slant mount (33 degrees of forward slant).



Pictured Below (From left to right): Topological optimization (shell model), topological optimization (solid block), zenith slant with GOLA, zenith with conical horn.

