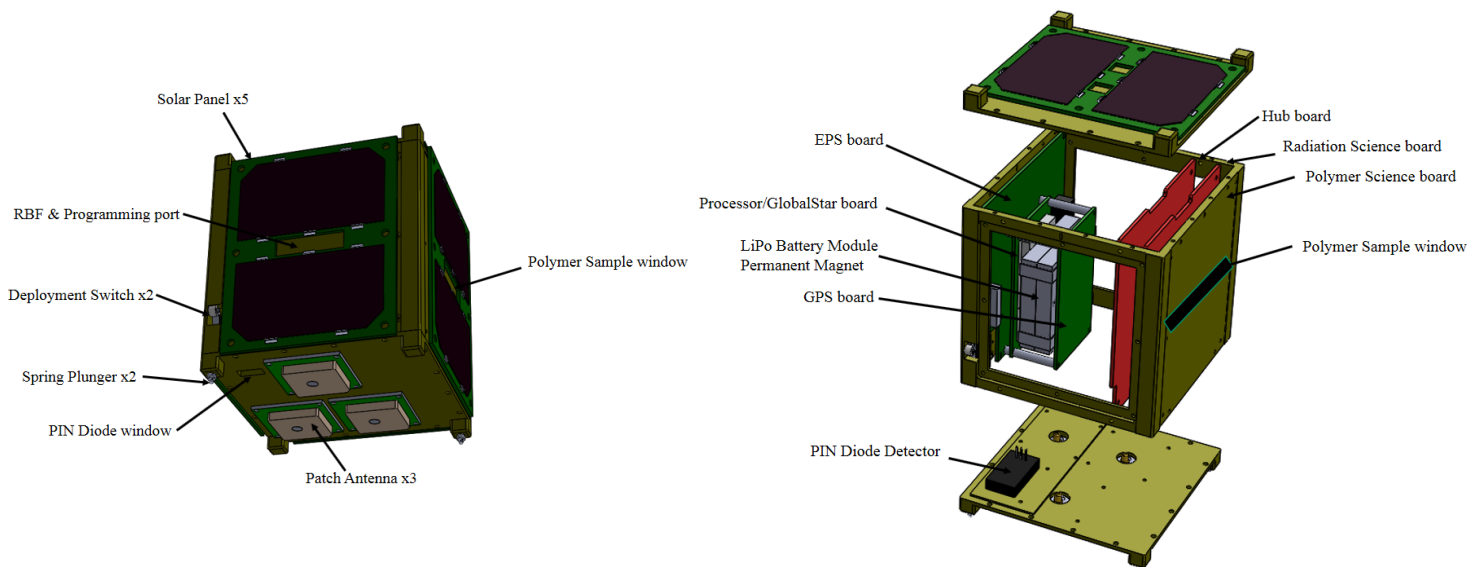


MakerSat-0 – Northwest Nazarene University – 1U



MakerSat-0 will study the viability of various 3D printed polymers for in-space manufacturing of spacecraft structures. It will also demonstrate a multi-user architecture for sharing the satellite core systems among several science team payloads.

Upon deployment from the P-POD, MakerSat will power up and start a 50 minute timer after which its GlobalStar radio will be activated. Health beacon and science data will be transmitted every 70 minutes. A GlobalStar receiver is installed to accept power-down commands from the operator.

The CubeSat structure is made of Aluminum 6061-T6. It contains all standard commercial off the shelf (COTS) materials, electrical components, PCBs and solar cells. The GlobalStar radio uses two ceramic patch antennas, one for transmit and one for receive.

MakerSat-0 has two payloads: an NNU polymer experiment and a CHS space weather experiment. The polymer experiment has four tiny 3d printed plastic masses on the ends of small cantilevers that are vibrated by a small cellphone motor from 40-100Hz. The circuit measures changes in their resonant frequencies over the mission lifetime in order to observe mass losses in the plastic samples, due to the harsh space environment. Four half gram samples of ABS, Nylon, PLA, and PEI plastic, from the approved NASA Materials list, are inside the NNU science experiment. The CHS experiment contains a PIN diode radiation particle counter sensor.

There are no pressure vessels, hazardous or exotic materials.

The electrical power storage system consists of common lithium-polymer batteries with over-charge/current protection circuitry. The lithium polymer batteries and circuitry are from Tenergy 3.7V 2200mAh (925050) Battery - UL Listed.