

S-CUBED Flight Electronics Assembly Plan

4/23/2020 – Jarrett Wehle

This is a quick overview, please check the Missions Document for a detailed subsystem discussion.

The following components would need to be purchased to assemble the flight CubeSat. Please remember, testing is a massive and underestimated cost to designing space electronics. By purchasing commercial units with **flight heritage**, this can be largely reduced, as well as reduce mission risk.

The package offered by NanoAvionics Includes the following components. An initial quote was made for \$86225, but could be significantly reduced by a promotion of NanoAvionics by RIT SPEX.

1. CubeSat On-Board Computer – Main Bus Unit SatBus 3C2 <https://nanoavionics.com/cubesat-components/cubesat-on-board-computer-main-bus-unit-satbus-3c2/>
2. CubeSat Electrical Power System EPS <https://nanoavionics.com/cubesat-components/cubesat-electrical-power-system-eps/>
3. CubeSat Reaction Wheels Control System SatBus 4RW0 <https://nanoavionics.com/cubesat-components/cubesat-reaction-wheels-control-system-satbus-4rw/>
4. CubeSat UHF Digital Radio Transceiver SatCOM UHF <https://nanoavionics.com/cubesat-components/cubesat-uhf-digital-radio-transceiver-satcom-uhf/>
5. CubeSat UHF Antenna System <https://nanoavionics.com/cubesat-components/cubesat-uhf-antenna/>
6. CubeSat GPS Receiver/Next Generation piNAV-NG http://www.skyfoxlabs.com/pdf/piNAV-NG_Datasheet_rev_F.pdf
7. Micro Active GPS-L1 Patch Antenna microPATCH-L1 http://www.skyfoxlabs.com/pdf/microPATCH-L1_Datasheet_rev_A.pdf
8. Solar Cells:
 - a. Choice A (from P19101) GOM Space P110 High efficiency solar panel for small nanosatellites <https://gomspace.com/shop/subsystems/power/p110-solar-panel.aspx>
 - b. Choice B (better compatibility with NanoAvionics) CubeSat GaAs Solar Panel <https://nanoavionics.com/cubesat-components/cubesat-gaas-solar-panel/>
9. P20101-021 Deployment Sensors PCB
10. Stepper Motor for deployment (our team only used the original P18101 gearmotor, which would very clearly not pass CubeSat regulations, is highly unreliable as found from testing, and requires a 12V rail to be generated)
 - a. A new team could select a stepper motor with the requirement that only the 5V rail be used so the Flight Computer can directly driving it using its built in Magnetorquer H-bridge outputs.