Deployable Triband Turnstile Antenna Assembly

| UHF (436 MHz) Turnstile Elements | L Band (1.3 GHz) Turnstile Elements | S Band (2.4 GHz) Turnstile Elements | Burn Wire Deploy Mechanism |

Deployable Helical Antenna Assembly

S Band (2.4 GHz) 12 dBi 16 turn helical antenna

Burn Wire Deploy Mechanism

Critical Subsystem

C3 Card (Flight Computer)

- RH Watchdog
- 16 GB eMMC Flash Memory
- OreSat Power Domain (OPD) Controller
- PA / LNA Front End
- AX5043 Transceiver
- AX5043 Transceiver
- LNA Front End
- Down Converter
- M4
- SPI
- 436 MHz TX/RX
- 1.27 GHz RX only

CAN bus 1 (Critical)
VBUS (6.0,7.2,8.4)V + OPD
CAN bus 2 (Mission)

Battery Card 1 (+Z)
(6.0, 7.2, 8.4) V @ 5.2 Ah
Fuel gauge, BPM, Temp, Heater
Inhibit and Disconnect Switches — M0 / OPD

Battery Card 1 (+Z)
(6.0, 7.2, 8.4) V @ 5.2 Ah
Fuel gauge, BPM, Temp, Heater
Inhibit and Disconnect Switches — M0 / OPD

Solar Module 1 (+X+Z) Alta Device GaAs 1W Module with MPPT, V/I/T monitoring — M0
Solar Module 2 (+X-Z) Alta Device GaAs 1W Module with MPPT, V/I/T monitoring — M0
Solar Module 3 (+Y+Z) Alta Device GaAs 1W Module with MPPT, V/I/T monitoring — M0
Solar Module 4 (+Y-Z) Alta Device GaAs 1W Module with MPPT, V/I — M0
Solar Module 5 (-X+Z) Alta Device GaAs 1W Module with MPPT, V/I — M0
Solar Module 6 (-X-Z) Alta Device GaAs 1W Module with MPPT, V/I/T monitoring — M0
Solar Module 7 (-Y+Z) Alta Device GaAs 1W Module with MPPT, V/I/T monitoring — M0
Solar Module 8 (-Y-Z) Alta Device GaAs 1W Module with MPPT, V/I/T monitoring — M0

OreSat Live

OreSat Live Card
16 GB eMMC Flash Memory
Image Processing and Encoding Algorithms

A8 / OPD

- Atheros AR9271 USB WiFi Adapter
- LNA and 31 dBm PA
- Antenna Switch
- Sony IMX219 8MP USB Camera
- 16 mm Lens

Cirrus Flux Camera

Cirrus Flux Camera Card
16 GB eMMC Flash Memory
Sensor and Filter Control Algorithms

A8 / OPD

- Princeton Short Wave Infrared (SWIR) Sensor
- Polarization and Frequency Filters
- 50 mm SWIR Lens
- Thermal Electric Cooler (TEC) + Thermal Radiator

Attitude Control System (ACS) Card

IMU + MAG
Bosch BMI088 6 DOF IMU
4x Memsic MMC5803 Magnetomers
(2x each on +Z and -Z End Caps) — M0 / OPD

ACS Assembly 1
+X+Y Reaction Wheel
Z Magnetorquer — L4 / OPD

ACS Assembly 2
+X-Y Reaction Wheel
X Magnetorquer — L4 / OPD

ACS Assembly 3
-X+Y Reaction Wheel
Y Magnetorquer — L4 / OPD

ACS Assembly 4
-X-Y Reaction Wheel — L4 / OPD

Attitude Determination and Control System (ADCS)

1.575 GHz RX only

SDR GPS + ADCS Card
Maxim MAX2771-based SDR
16 GB eMMC Flash Memory
GPSTK and ADCS Control Algorithms

A8 / OPD

Star Tracker Card
On Semi AR0134CS Camera
16 GB eMMC Flash Memory
OpenStarTracker.org Algorithms

A8 / OPD

OPD = OreSat Power Domain (power bus + I2C card power control)

OreSat Block Diagram

Oregon's First satellite
www.oresat.org
V5.0 2020/04/21

M0 = ST STM32F046K6 48 MHz 32 bit ARM Cortex-M0 running ChibiOS
L4 = ST STM32L452RE 80 MHz 32 bit ARM Cortex-M4F running ChibiOS
M4 = ST STM32F446 168 MHz 32 bit ARM Cortex-M4F running ChibiOS
A8 = Octavo OSD335x-SM 1 GHz 32 bit ARM Cortex-A8 running Linux