

Sapphire

Specification sheet Copenhagen Suborbitals

General info

Thrust vectoring and active guidance test vehicle

Lift off mass: 202.7 kg

Propellant mass: 58.1 kg

Length: 528 cm

Body diameter: 22 cm

Maximum velocity: 380 m/s

Apogee: 10.6 km

Guidance and Navigation Computer

Flight vector analysis and Thrust Vector Control computer

IMU: Analog Devices ADIS16367

Hardware platform: Custom design

CPU: ARM Cortex-M3

OS: None

Memory: Compact Flash

Power supply: 2 x 800 mAh 7.4 V LiPo cells

Data downlinked @ 64 kbps

Propulsion

Hybrid rocket motor

Pressure fed by oxidizer vapour pressure

Seven port cylindrical grain geometry

Valveless pyrotechnic ignition system

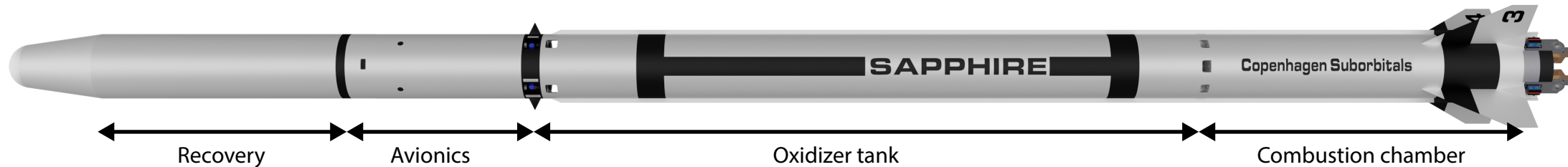
Fuel: Polyurethane - 16.6 kg

Oxidizer: Liquid nitrous oxide - 41.5 kg

ISP: 181 s

Max thrust: 12 kN

Burn time: 20.8 s ($P_c > 2$ bar)



Autonomous Abort Unit

Flight vector analysis and flight termination unit

2 X Arduino MEGA (ATmega1280 @16 MHz)

2 X Inertial Measurement Unit with:

Accelerometer: STMicroelectronics LSM303DLH

Gyro: STMicroelectronics L3G4200D

2 X 2 GB SD card memory

GPS - Copernicus II

Data transmission @ 20 Hz (50 byte per package)

Telemetry Transmitter

Data downlink to FIDO and Mission Control

Frequency range: 2330 - 2480 MHz

Modulation: GFSK

RF power: 30 dBm

Max throughput: 2 Mbps (incl. overhead & FEC)

FEC: Rate 1/2 convolutional code

Antenna: 1/4 lambda monopole

Data I/F, packet generator and FEC: PIC24

RF modulator: ADF7242

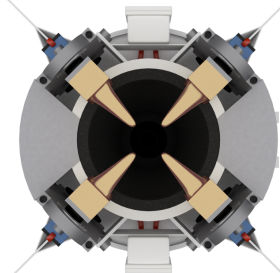
Linear amplifier: ALM-31222

Thrust Vector Control

Jet vane and servo operated TVC system

Futaba BLS157HV servo motors

Copper jet vanes



Follow the June 23rd launch live via HD stream at www.CopenhagenSuborbitals.com