



INTERORBITAL SYSTEMS TubeSat Satellite Kit



\$8,000 TubeSat KIT INCLUDES FREE LAUNCH!

Interorbital Systems' TubeSat pico-satellite kit can be assembled into a low-cost satellite bus or a fully functioning satellite. The price of the TubeSat kit includes a guaranteed launch into low-Earth orbit on Interorbital's NEPTUNE 30 (N30) rocket. Launches are scheduled to begin in the fourth quarter of 2010.

Examples of TubeSat experiments include the following:

- ▼ Earth-from-space video imaging
- ▼ Earth magnetic field measurement
- ▼ Satellite orientation detection (horizon sensor, gyros, accelerometers, etc.)
- ▼ Amateur radio relay
- ▼ Orbital environment measurements (temperature, pressure, radiation, etc.)
- ▼ On-orbit hardware and software component testing (microprocessors, etc.)
- ▼ Tracking migratory animals from orbit
- ▼ Testing satellite stabilization methods
- ▼ Biological experimentation
- ▼ Automatic simple, repeating "message from orbit" transmission
- ▼ Private e-mail

The builder can add any type of electronics or software application he or she wishes as long as it satisfies the volume and mass restrictions. These restrictions provide a unique intellectual challenge for the application designer.

Each TubeSat Kit includes the following basic hardware and software:

- ▼ Printed Circuit Board Gerber Files
- ▼ A Transceiver
- ▼ A Battery Pack
- ▼ Solar Cells
- ▼ Power Management Control System Components
- ▼ Microcomputer
- ▼ Software
- ▼ Antennas
- ▼ Power switch
- ▼ Complete Instructions



TubeSat with Sample Ejection Cylinder

The total mass of the basic TubeSat systems is 0.50 kg. This leaves 0.25 kg for your experiment.

Your TubeSat will be launched into orbit on the IOS NEPTUNE 30 rocket

The IOS NEPTUNE 30 is a three-stage, modular, ultra low-cost orbital launch vehicle developed and built by Interorbital Systems. It is designed to place 30 kilograms into polar low-Earth orbit. This payload capacity allows formations of 32 TubeSats or a

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combination of CubeSats and TubeSats to be launched per orbital mission with each TubeSat or CubeSat housed in its own dedicated ejection cylinder. Other orbits are also available.

Your TubeSat will be launched into a polar orbit

IOS rockets are slated to be launched into orbit from the IOS Spaceport Tonga located in the South Pacific Kingdom of Tonga.

Your TubeSat will be launched into a self-decaying orbit

TubeSats are designed to operate for up to 2 months. They will be launched into a 310 km orbit with an orbital longevity of three weeks to three months depending on the solar weather. At some time during the end of this period, they will safely re-enter the atmosphere and burn up. This prevents the build-up of orbital debris fields.

Your TubeSat can be monitored on the ground Amateur Radio receivers

TubeSat owners can build their own uplink/downlink installation, use a hand-held receiver, or make use of existing ground stations or networks located around the world. Interorbital is presently developing a web-based communications system for the TubeSat community.

Multiple TubeSats

TubeSats are also available as Double TubeSats or Triple TubeSats. The length, volume, and mass of these expanded TubeSats are based on the multiplying factor.

Specifications

Dimensions:

TubeSat Shell: Max OD = 8.94 cm (3.52 in), ID= 8.56 cm (3.37 in), Length = 12.7 cm (5.0 in)

TubeSat Bearing to Bearing Length: 13.72 cm (5.4 in)

Deployment Cylinder: OD = 10.20 cm (4.00 in) ID = 9.91 cm (3.90 in)

The gap between the outside of the TubeSat and the inside of the Deployment Unit is 0.48 cm (0.19 in). This gap can be utilized for solar cells, antennas, or other hardware.

Mass (max): 0.75 kg

Mass Application with basic bus components (max): 0.25 kg

Mass of hardware: 0.50 kg

Experiment or Function Space: Max OD = 8.94 cm (3.52 in) Length = approx. 5.0 cm (2 in)

Transceiver Options:

Amateur Radio Band: Frequency 433 MHz

Voltage: 4.5–5.0 VDC; Output: 500 mW mW

License Free: Frequency: 902 to 928 MHz or 2.4000 to 2.4835 GHz Spread Spectrum

Voltage: 3.3VDC; Output: 100 mW to 1,000 mW Selectable

Computer: Micro Controller with memory board

Battery Power: Lithium Ion 3.6 V

Solar Cells: 2.52 V 31 mA (48)

Antenna: Dipole

Specifications are subject to change. E-mail Interorbital Systems for more detailed information on hardware and ordering.

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