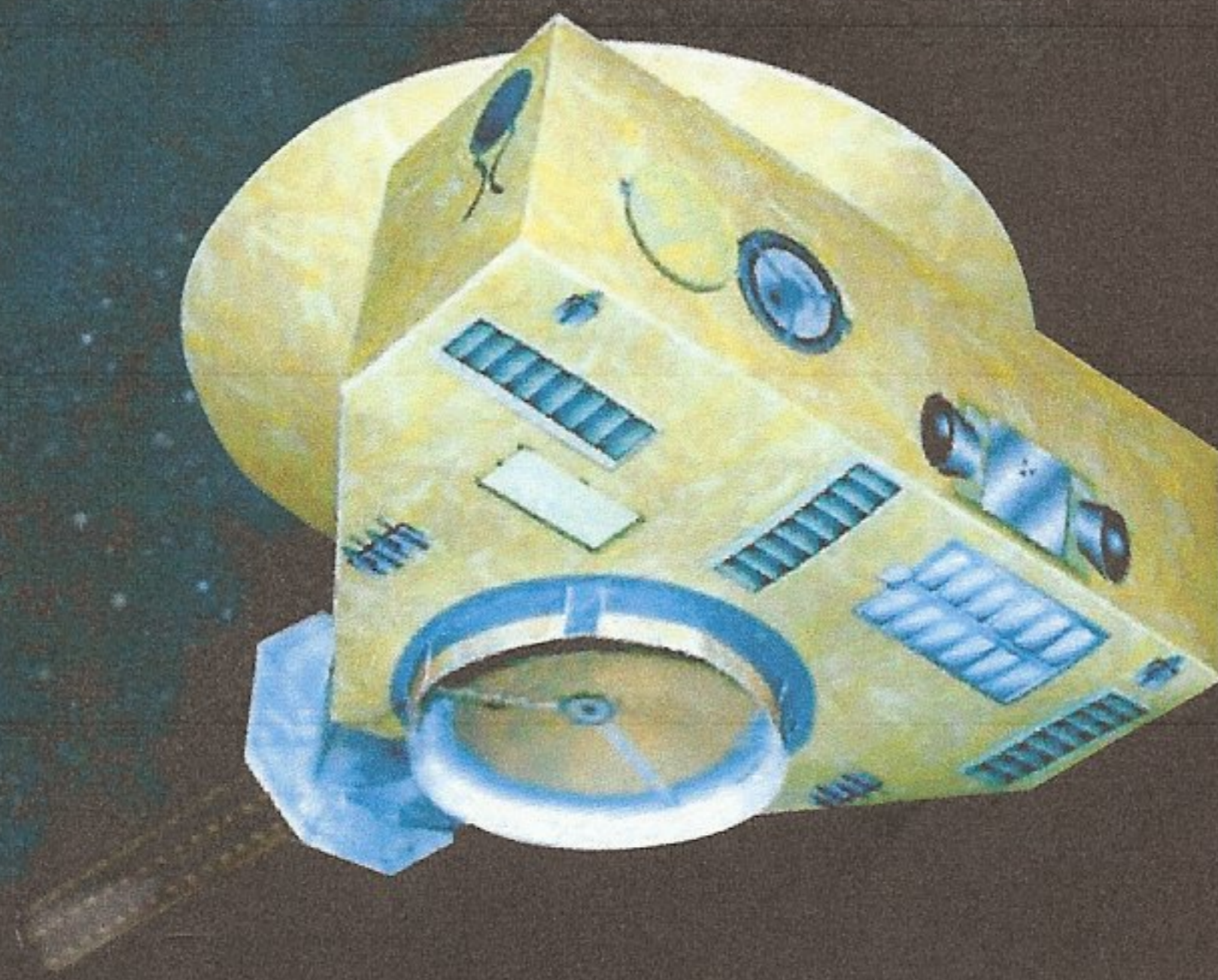


New Horizons

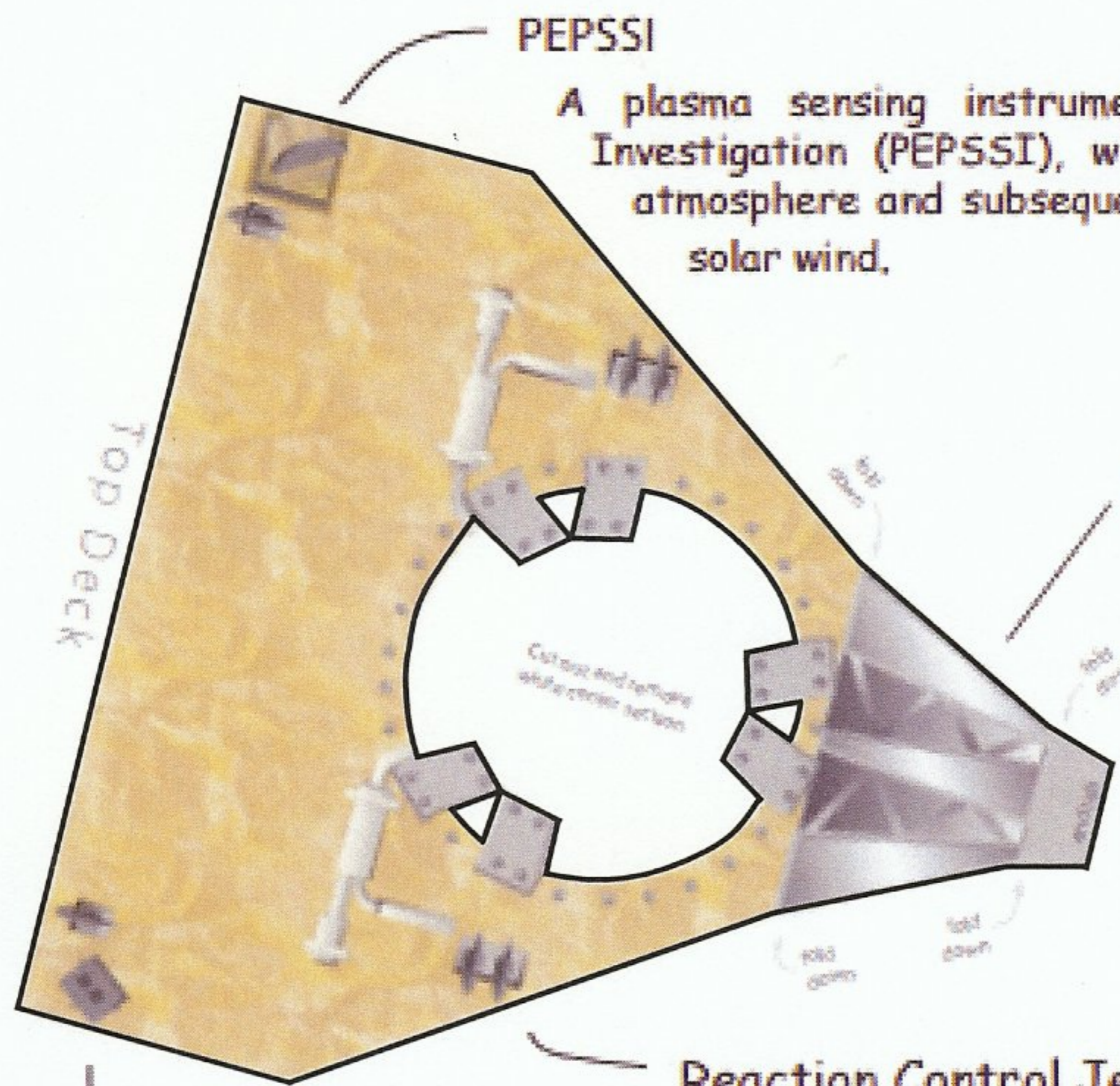
1/25 scale Paper Model

New Horizons is the first mission to the last planet. Build this model of New Horizons and learn about the spacecraft's systems. Then follow the progress of the mission as it swings past Jupiter out to Pluto-Charon and on to the Kuiper Belt.



Parts Set ver 6/26/06

The New Horizons spacecraft is about 6 ft (2 m) on a side and 2 ft (60 cm) tall, about the size and shape of a grand piano. It contains a propulsion system, a thermal control system, redundant computer, navigation and communications systems, as well as a suite of science instruments, all weighing a mere 1054 lbs (478 kg).



PEPSSI

A plasma sensing instrument, the Pluto Energetic Particle Spectrometer Investigation (PEPSSI), will search for neutral atoms that escape Pluto's atmosphere and subsequently become charged by their interaction with the solar wind.

RTG Mount

This structure, used to mount the RTG power system to the spacecraft, is made out of titanium. The special properties of titanium; high strength per weight and low heat transfer are well suited to supporting the heavy RTG during launch and keeping the very warm RTG from over-heating the spacecraft and instruments

Reaction Control Jets

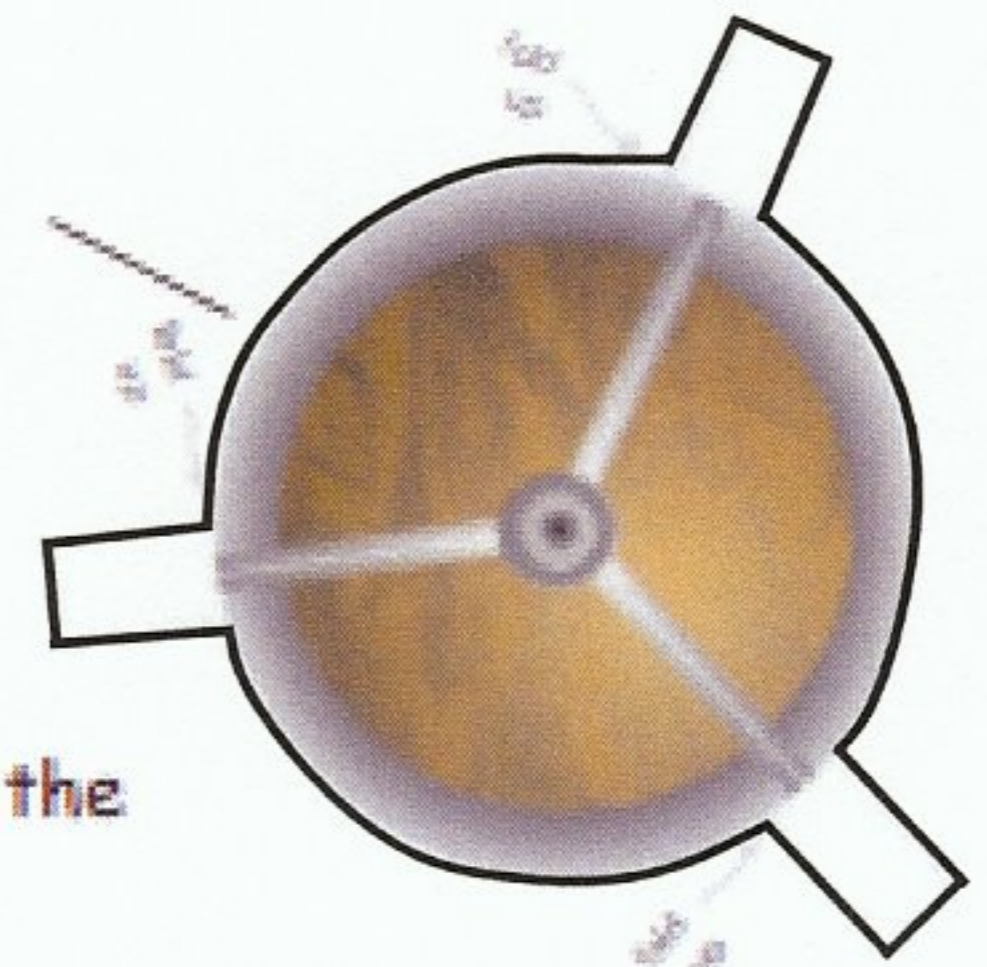
The New Horizons spacecraft controls its attitude in space through the use of short bursts from these small thrusters arrayed around the vehicle. Each thruster contains a catalytic bed that splits the monopropellant hydrazine into hot component gases which jet out and gently nudge the spacecraft.

Sun Sensor

For maximum data rate the high gain antenna must be kept pointing at Earth. If the spacecraft loses track of its attitude, this Sun Sensor will allow the spacecraft to regain a sun pointing orientation and start an Earth search.

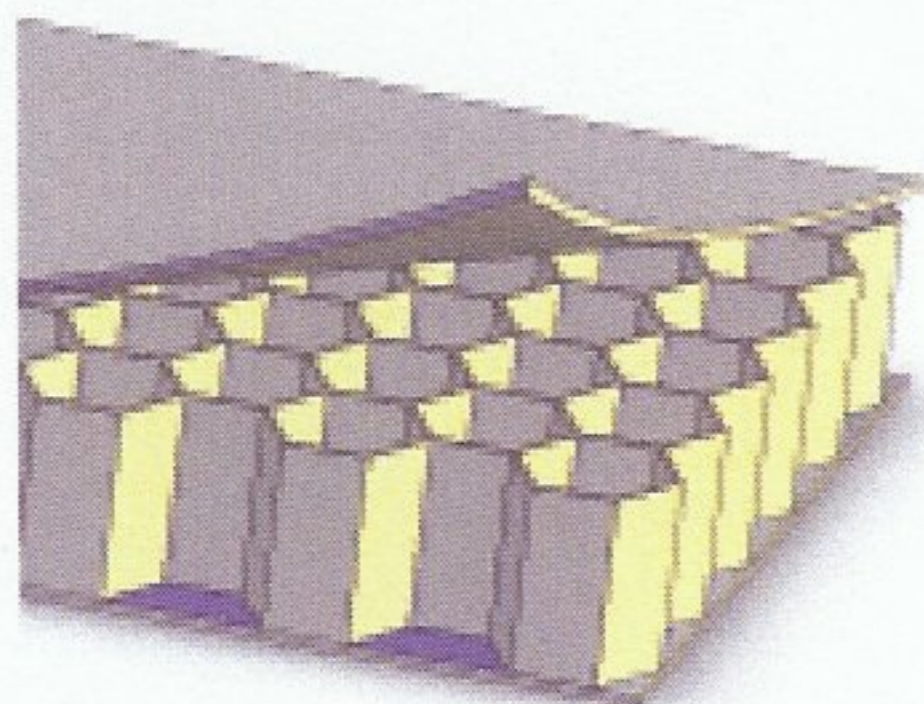
Propellant Tank

This tank, made of corrosion resistant Titanium and nestled in the center of the spacecraft where it can be kept warm, carries 170 lbs (78 kg) of liquid hydrazine to supply the reaction control jets for the entire 15+ year duration of the New Horizons mission.



Sitting just below the tank is a low gain antenna which provides low speed communications with Earth when the spacecraft's high gain antenna is pointing away.

How to slim-down a spacecraft



The weight of the spacecraft structure is minimized by using honeycomb aluminum panels. The 1" thick panels are made of 1/8" cell aluminum honeycomb core with 0.005" thick aluminum foil sheets bonded to each face. This design cuts the weight of each panel to 1/9 that of an equally strong solid aluminum panel.

The reaction control system is the sole means the New Horizons spacecraft has to alter its course after it separates from the launch vehicle 3rd stage. With the ability to change its speed by less than 300 m/s, New Horizons will only be able to alter its course by less than two degrees at Pluto. In-flight maneuvers must be carefully budgeted to save propellant for Kuiper Belt Object intercept maneuvers.