

SCORPION

FACT SHEET



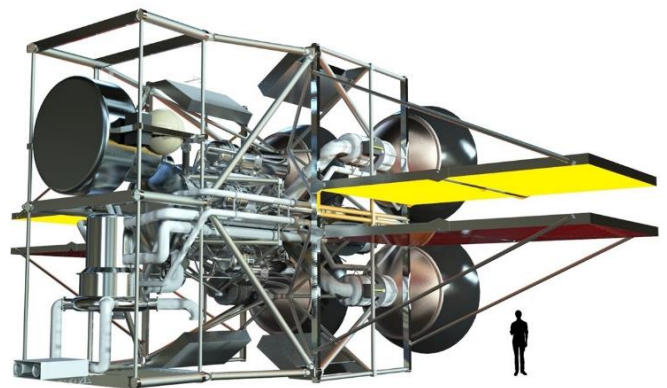
The Scorpion is the result of a six year study by Hemsell Astronautics into what could have been achieved in the fifty years since the Apollo Moon landings. The concept design uses only technology that could have been available in that timeframe.

The Scorpion is a multi-purpose crewed spacecraft concept that would be constructed then supported in low Earth orbit. From there it can carry its crew of six and their equipment and cargo to higher earth orbits, the Moon and (with a booster) to the orbits of Mars and Venus.

Key Specifications

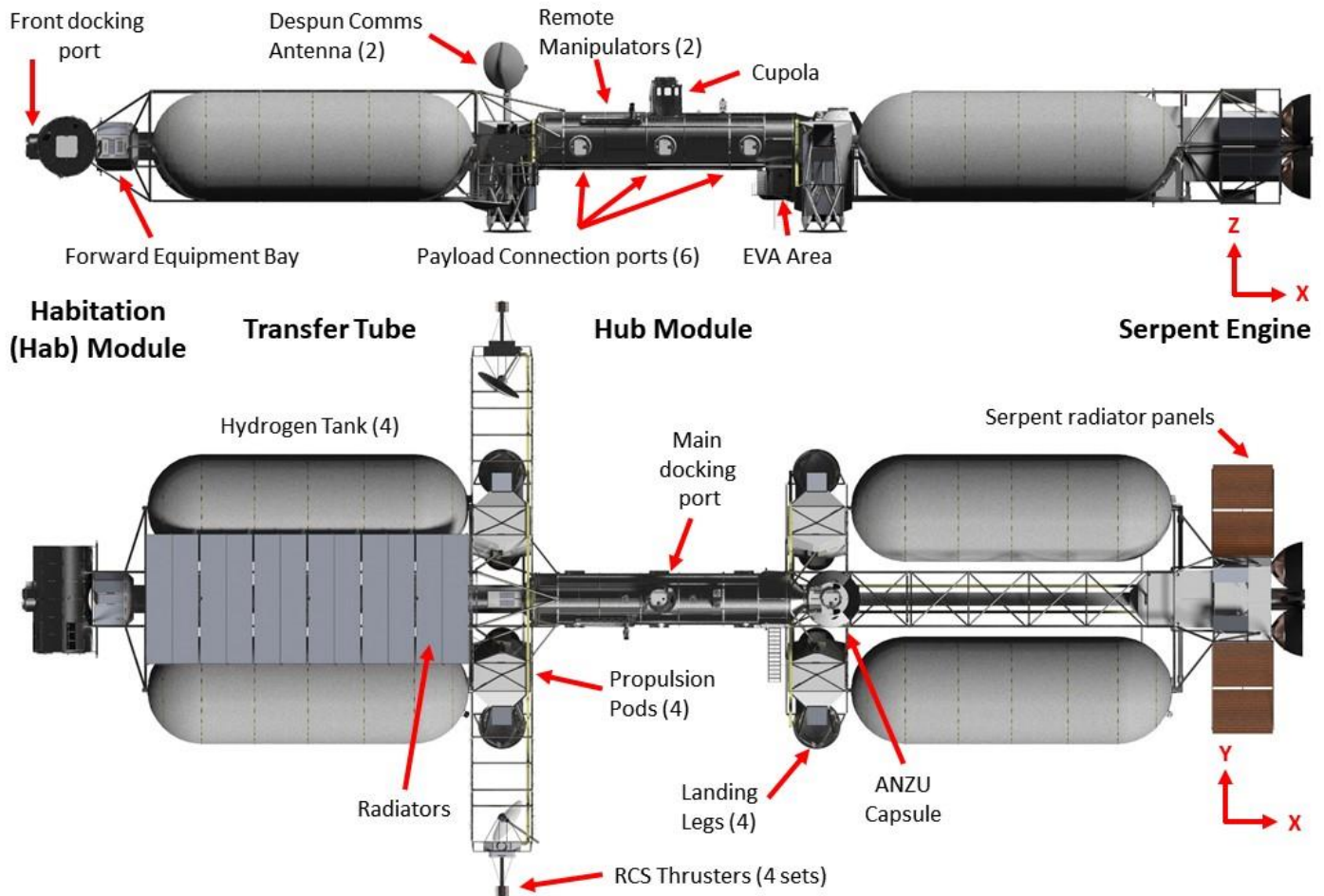
- **107 m. long, 60 m. wide, 13 m. high**
- **Pressurised habitable volume: 622 m³**
- **Unfuelled Mass: 240 tonnes**
- **Payload mass: between 20 and 500 tonnes (carried internally and on six attachment points)**
- **Propellants:**
 - liquid hydrogen (400 tonnes max.)
 - liquid oxygen (110 tonnes max.)

Serpent Nuclear Engine



At the heart of the Scorpion is a nuclear engine call Serpent. Invented by Alan Bond, this engine heats the hydrogen propellant in two stages. The first stage is direct heating using heat exchangers and the second stage is electrical arc heating in the thrust chamber. As a by-product the engine produces over a hundred kilowatts of electrical energy to power the Scorpion's systems.

- **Thrust: 200 tonnes**
- **Exhaust velocity: 12.7 kilometres/second**
- **Mass: 40 tonnes**
- **Reactor Power: 14.6 Gigawatt**



Two Views of the Scorpion

Secondary Propulsion



ADVANCED CHEMICAL ROCKET ENGINE (ACRE)

Specifications:

Thrust	= 600 kN
Specific Impulse	= 4655 N s /kg
Throttle range	= 20% - 100%
Mass	= 1100 kg
Diameter	= 3.2 m
Length	= 6.1 m

When the Scorpion needs controllable thrust or is too close to other inhabited systems to use the Serpent, it uses a second propulsion system. This comprises four Advanced Chemical Rocket Engines, housed in side mounted propulsion pods.

Habitation



The Scorpion has two main habitation areas. The crew lives in the Habitation Module at the front which has the bridge, crew cabins, a galley and wardroom, hygiene facilities, and a medical area. In the middle is the Hub which houses the life support system, the payload storage areas and attachment points and airlocks for spacewalks.