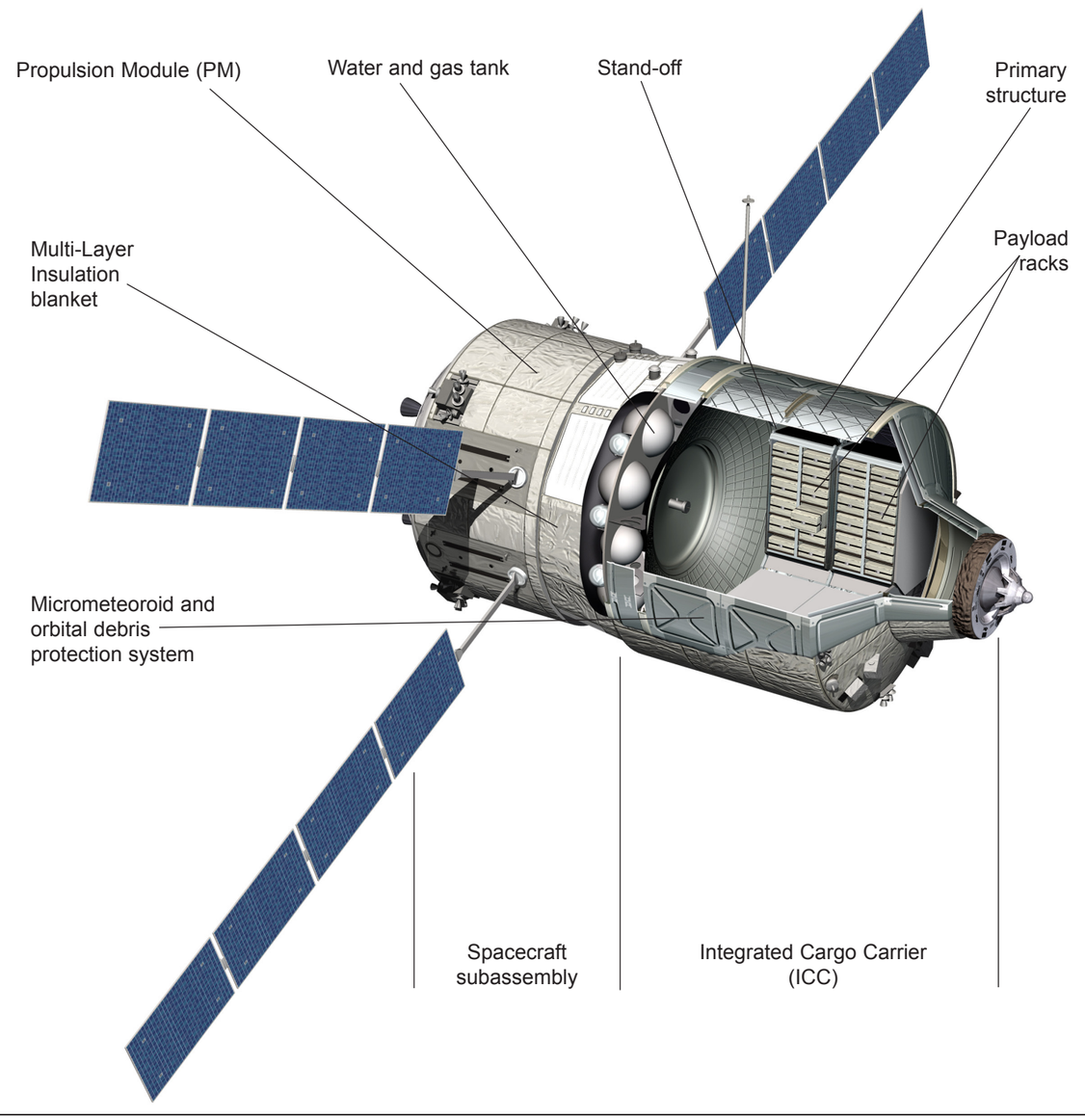
Utilisation Relevant Data

Launch Configuration	
Payload envelope:	8 racks with 2 x 0.314 m^3 and 2 x 0.414 m^3 each 1.146 m^3 in front of 4 of these 8 racks
Cargo mass:	Dry cargo: 1,500 - 5,500 kg Water: 0 - 840 kg Gas (Nitrogen, Oxygen, air, 2 gases/flight): 0 - 100 kg ISS Refueling propellant: 0 - 860 kg (306 kg of fuel, 554 kg of oxidizer) ISS re-boost and attitude control propellant: 0 - 4,700kg Total cargo upload capacity: 7,667 kg
Launch vehicle:	Ariane5(300x300km,51.6°transferorbit ATV will be launched with its solar panels folded to the body of the spacecraft. Electrical power will be supplied by non rechargeable batteries.

Launch site:	Kourou, French Guiana.
First flight:	Spring 2008
Flight rate:	Mean: 1 ATV/18 months

On Orbit Configuration
Deployed solar arrays, with a total span of 22.3 m, that provide electrical power to rechargeable batteries for eclipse periods. Automated flight towards the International Space Station.

Flight Hardware
Propulsion and re-boost system Avionics equipment Guidance navigation and control system Communications system Power generation and storage system Thermal control system Russian docking and refueling system

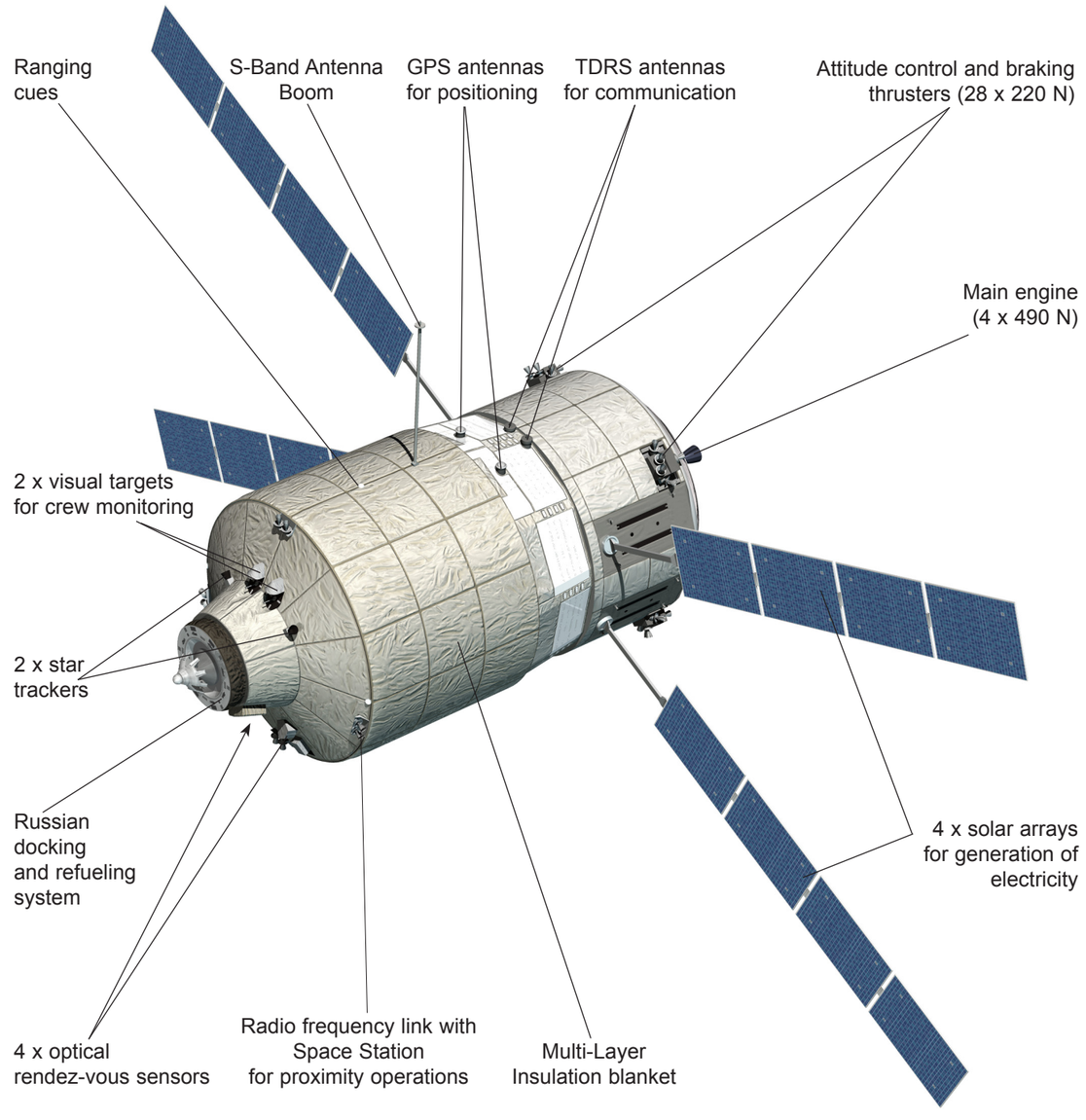


Illustrations: ESA/D. Ducros

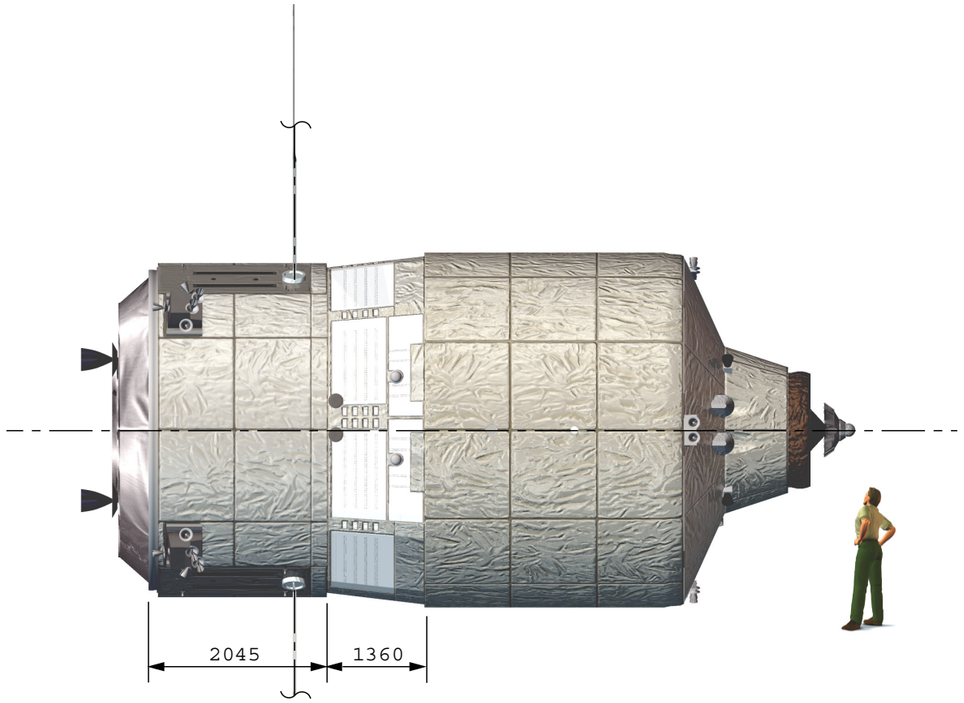
Automated Transfer Vehicle (ATV)

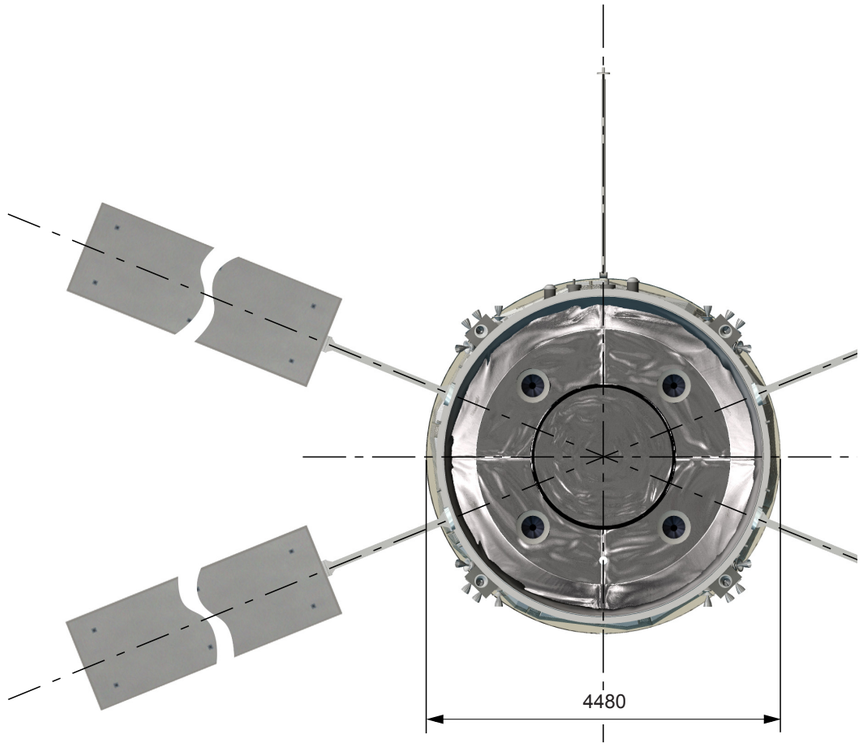
European servicing and logistics vehicle

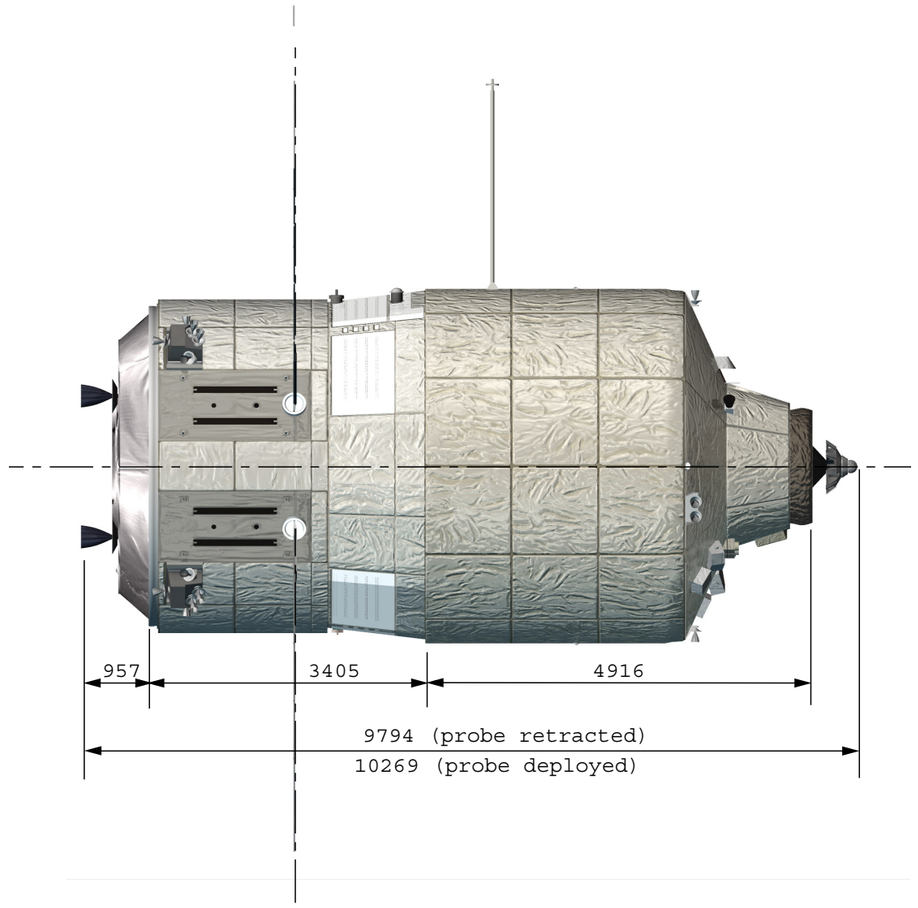
The Automated Transfer Vehicle is an unmanned automatic vehicle which is put in orbit by the European Ariane 5 launcher. It provides the International Space Station with: pressurized cargo, water, air, nitrogen, oxygen and attitude control propellant. It also removes waste from the station and re-boosts it to a higher altitude to compensate for the atmospheric drag.

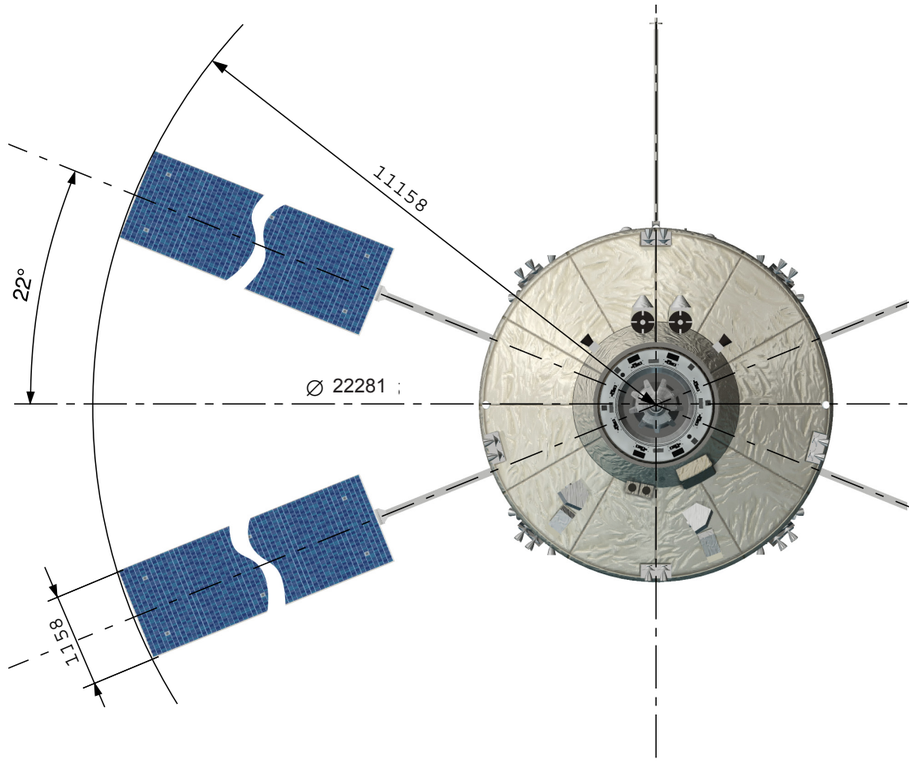


esa	PROJECT: **International Space Station**		
TITLE: **Automated Transfer Vehicle**		DOCUMENT N°: EUC-ESA-FSH-003	REV. 1.2









Specifications

Dimensions	
Length:	9,794 mm (probe retracted)
Largest diameter:	4,480 mm
Solar arrays span:	22,281 mm
Mass Budget	
Vehicle dry mass:	10,470 kg
Vehicle consumables:	2,613 kg
Total vehicle mass:	13,083 kg
Total cargo upload capacity:	7,500 kg
Mass at launch (max):	20,750 kg
Waste download capacity:	6,300 kg (420 km altitude, 51.6° inclination)
Propulsion	
Main propulsion system:	4 x 490 N thrusters (Pressurized liquid bi-propellant system)
Attitude control system:	28 x 220 N thrusters (Pressurized liquid bi-propellant system)
Propellant:	Monomethyl hydrazine fuel and Nitrogen tetroxide oxidizer
Pressurization:	Helium pressurant at 31 MPa
Communications Infrastructure	
To ground:	S-band via TDRS satellite
ATV to ISS:	S-band antenna via Proximity link
Navigation:	GPS
Thermal/Environmental Control	
Thermal Control:	Multi Layer Insulation material, active thermal control using Variable & Constant Conductive Heat Pipes and paints
ECLSS:	Fire detection, air circulation, air temperature monitoring
Electrical Power	
Ascent to ISS and de-orbit:	4 Solar panel wings of 4 panels each and 40 Ah rechargeable batteries
Number of arrays:	4
Number of panels/array:	4
Generated power:	3,800 W after 6 months in orbit
Required power: supplied by ISS:	< 400 W Dormant mode, < 900 W Active mode
Main Construction Material	
Pressure shell:	Al - 2219
Micrometeoroid and Debris Protection System:	
Primary bumper:	Al-6061-T6
Secondary bumper:	Nextel/Kevlar blankets
Internal structure (racks):	Al-6061-T6
Thermal insulation:	Goldised Kapton Multi-layer Insulation blanket & aluminised beta cloth
Solar arrays:	Silicium Solar Cells on 4 Carbon Fibre Reinforced Plastic Sandwich panels
Main Contractor	
	EADS-Space Transportation, Leading a consortium of many sub-contractors

esa

PROJECT: **International Space Station**

SCALE : 1:75

DIMENSIONS : mm

TITLE: **Automated Transfer Vehicle**

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