HYLAS
ESA-Avanti Success Story

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What is Hylas-1

1. HYLAS is the first satellite system developed in Europe to provide low-cost internet access across parts of the continent. Hylas-1 is the name of the first satellite.

2. The satellite system has been developed through a Public Private Partnership between ESA and the British satellite operator Avanti Communications.

3. Hylas-1 embarks an advanced telecommunication payload whose design, development, production and test has been financed by ESA

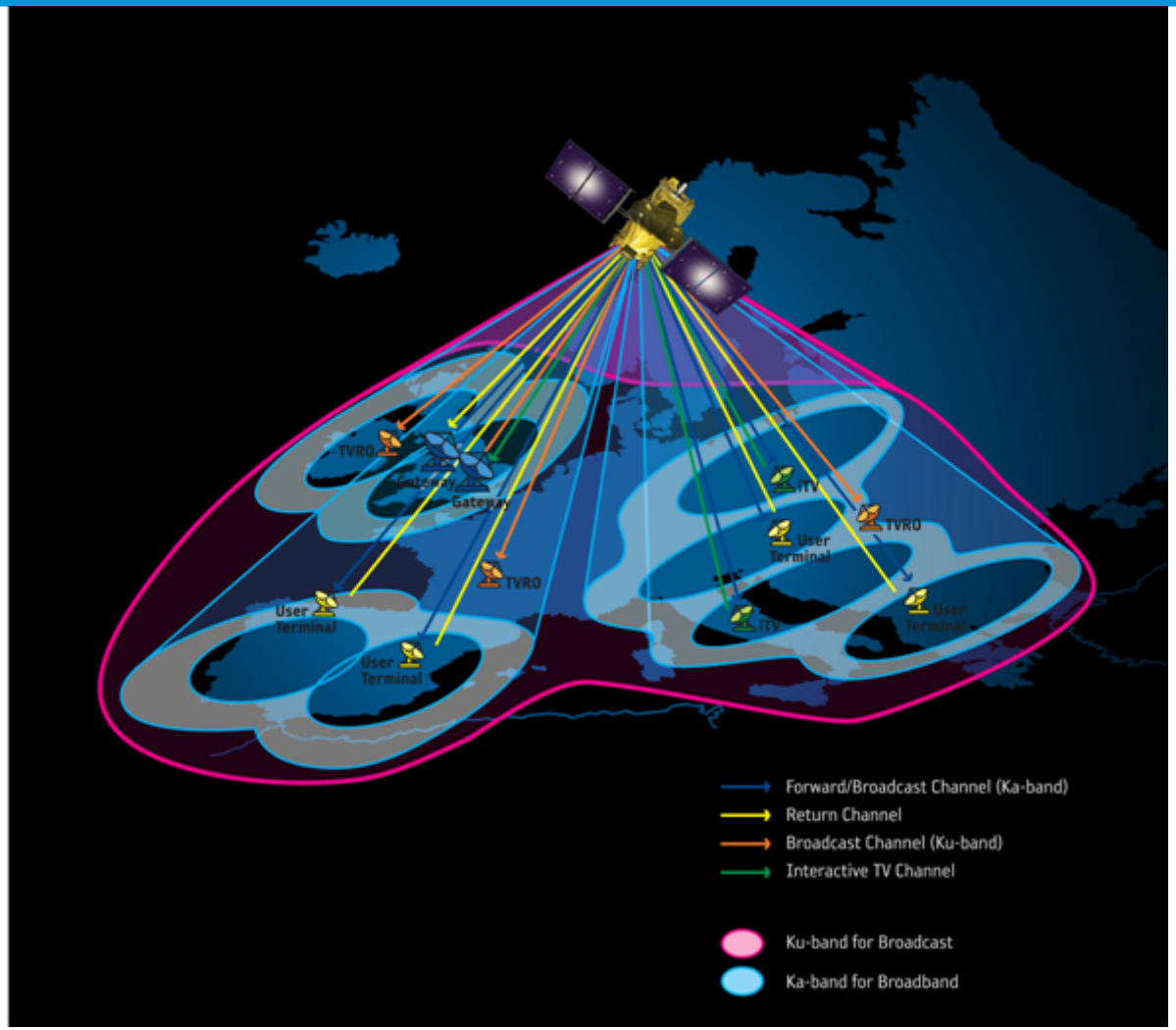
4. The support of UKSA (then-BNSC) has been fundamental to realise the project.

From myth to hi-tech reality

1. HYLAS stands for **Highly Adaptable Satellite**, a product of third millennium state of the art European Space technology
2. In Greek mythology, Hylas was a handsome young man, son of Heracles, who joined his father as one of the Argonauts in the quest for the Golden Fleece
3. Abducted by a nymph, fallen for Hylas' beauty, he was never to be found again
4. Hercules was very fond of Hylas whom he considered as a young apprentice
5. Hercules is a candidate name chosen by Avanti Communication for one of their future "big" satellites

J.W. Waterhouse painting (1896)

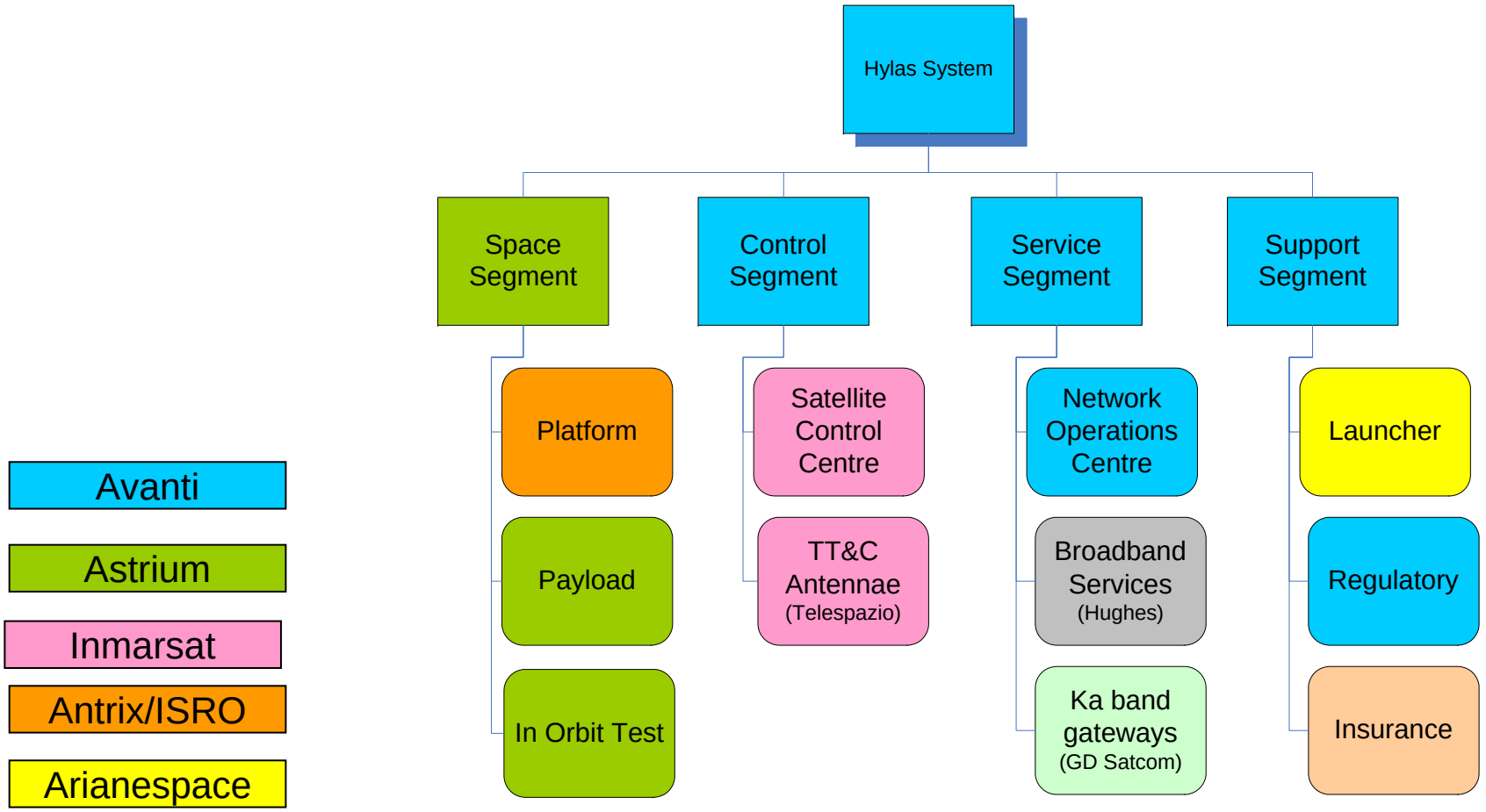
Satellite coverage Map



Who did what

1. ESA awarded a contract to Avanti for the HYLAS Mission, funding payload development and contributing to the launch costs
2. Avanti have awarded the Satellite procurement contract to EADS Astrium
3. The satellite is based however on an Indian platform, developed by the Indian Space Research Organisation (ISRO)
4. Inmarsat provide the satellite control centre infrastructure and services in London and Italy
5. Avanti Communications set up the Network Operations Centre and the Teleport in the United Kingdom (Cornwall)
6. The satellite In-Orbit Testing (IOT) was performed from the ESA Ground Station of Redu (B)

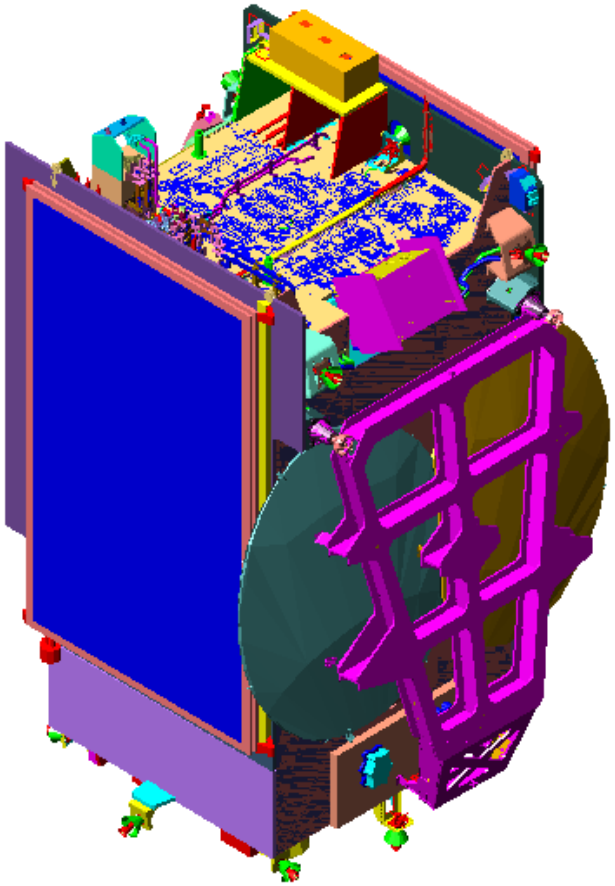
Industrial Team and Roles

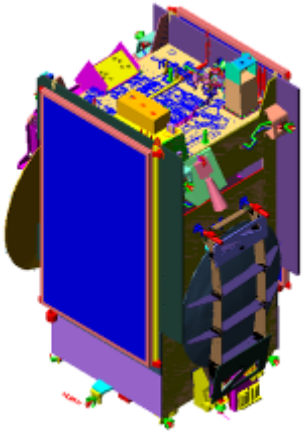


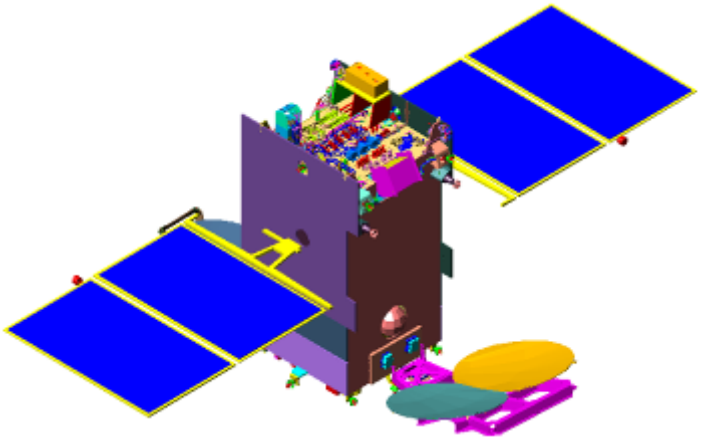
Spacecraft Data Sheet

1. Hylas Spacecraft
    a. Reference payload
        – 8 Ka band spot beams (0.6 deg aperture) 8x120W channels, EIRP 60.0 dBW (max)
        – 1 Ku band pan European coverage 2x150 W channels, EIRP 52.0 dBW
    b. Spacecraft stabilisation: three axis (momentum bias)
    c. Spacecraft mass (dry): 1120.0 kg
    d. Spacecraft Mass (lift-off): 2,560 kg (excluding adaptor)
    e. Payload mass: 261 kg (including antennae)
    f. Payload Power: 2000 W (EOL)
    g. Spacecraft Power: 3200 W (EOL)
    h. Solar Arrays: 2x deployable 2-panel wings with triple junction cells
    i. Batteries: 2x64 Ah Li-ion
    j. Overall dimensions: 4.2 m X 2.6 m X 2.5 m (stowed)
    k. TM band: Ku for emergency and on-station
    l. Operational lifetime: 15 years
    m. Orbital location: 33.5º W

Spacecraft Views







GFP technology

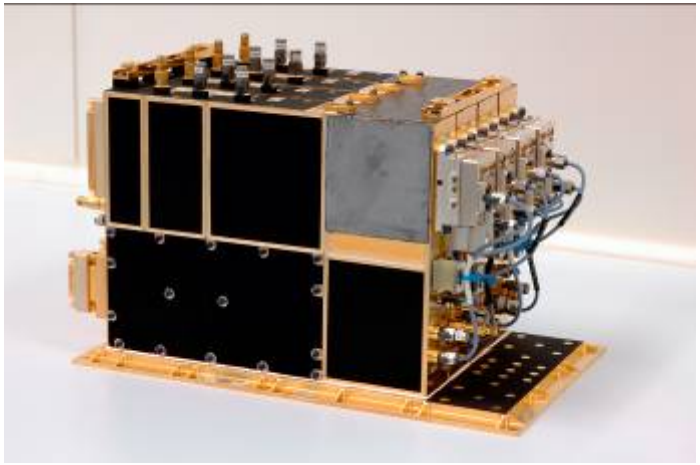
1. The use of General Flexible payload Technology allows the configuration of each transponder in terms of bandwidth, frequency plan and power allocation.

2. Bandwidth can be varied between 108 and 250 MHz for each of up to eight Ka Band transponders in 500 KHz steps. The Ku Band transponders can equally be adjusted between 18 and 120 MHz.

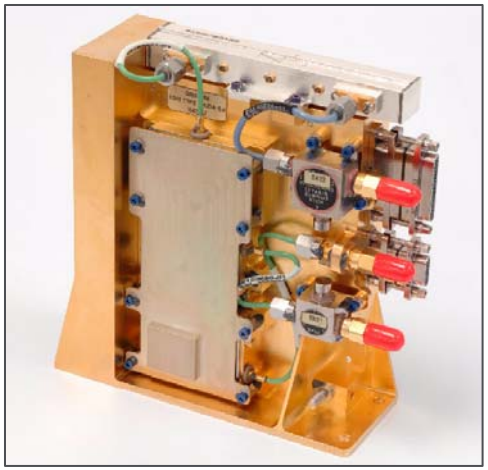
3. Power allocation is performed by using Tesat Flexible TWTA technology: this provides nearly-constant efficiency operation while the TWTA works within a 3 dB range.

4. The core of the payload equipment has been designed, developed, manufactured and tested by Atrium UK in their Portsmouth facilities

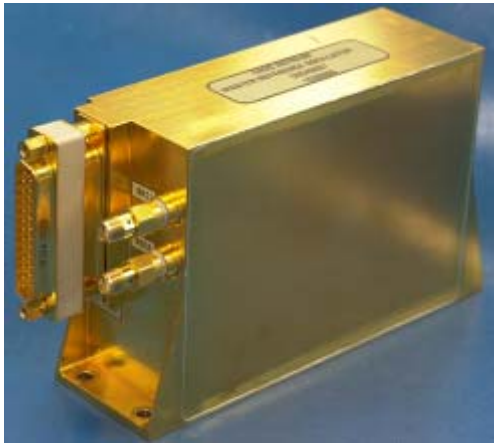
GFP Hardware



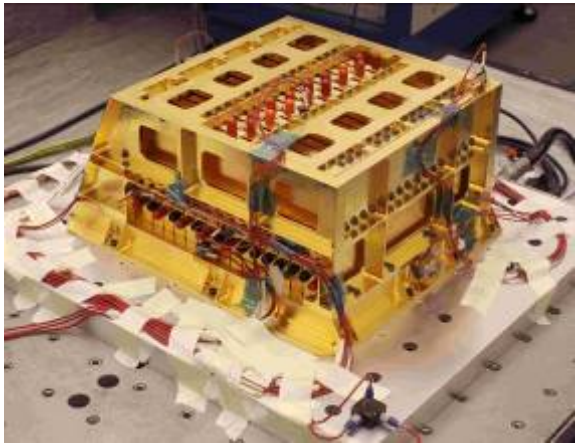
Single Channel Agile Converter Equipment (SCACE)



Agile Integrated Down Converter Assembly (AIDA)

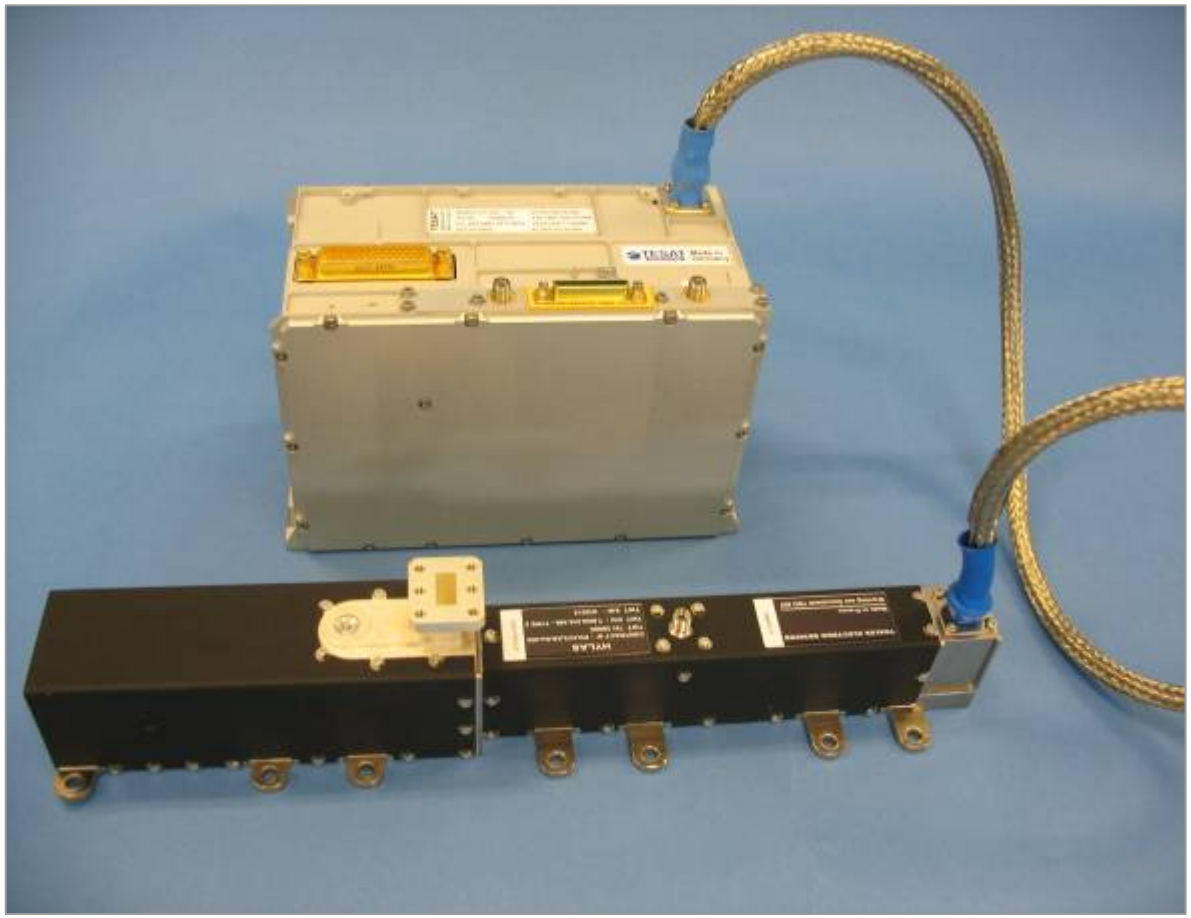


Master Reference Oscillator (MRO)

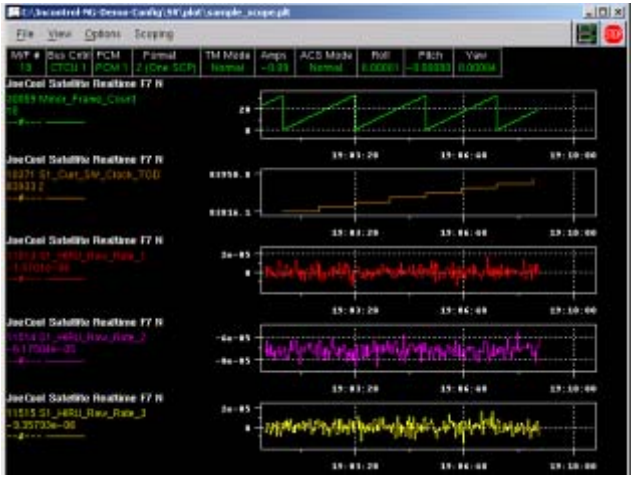


Routing And Switching Equipment (RASE)

Tesat Ka band Flexi-TWTA



Hylas Satellite Control Centre

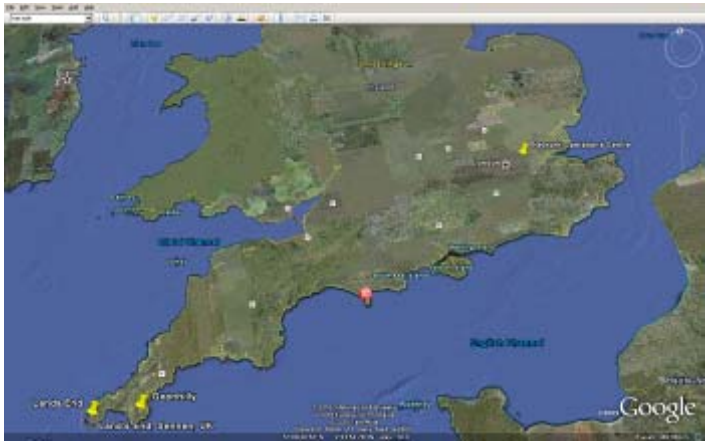


SCC- Primary TTC antenna in Fucino (I)

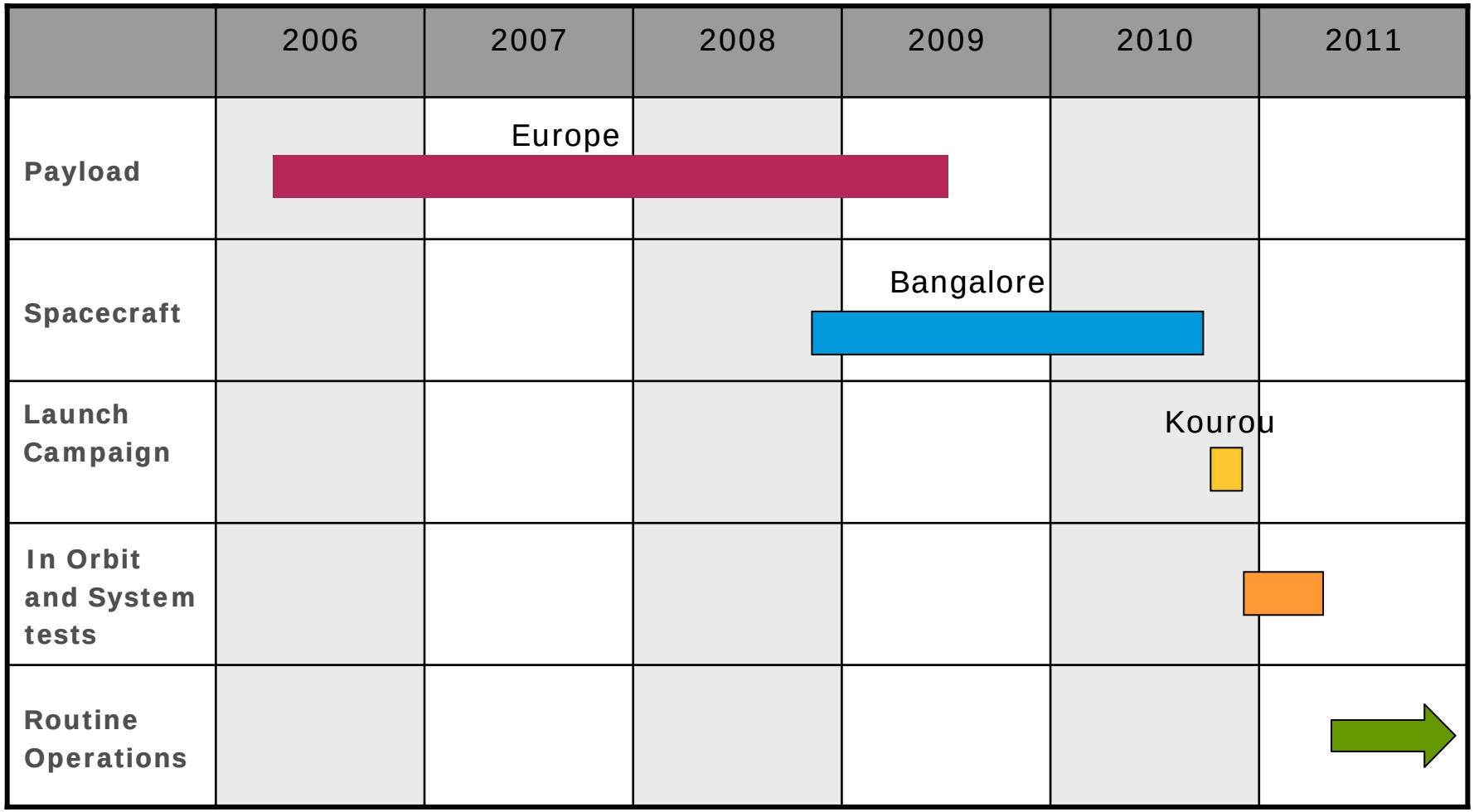
4.8 m Primary Ku band TT&C Antenna

14.3 m Ku band Emergency TT&C Antenna

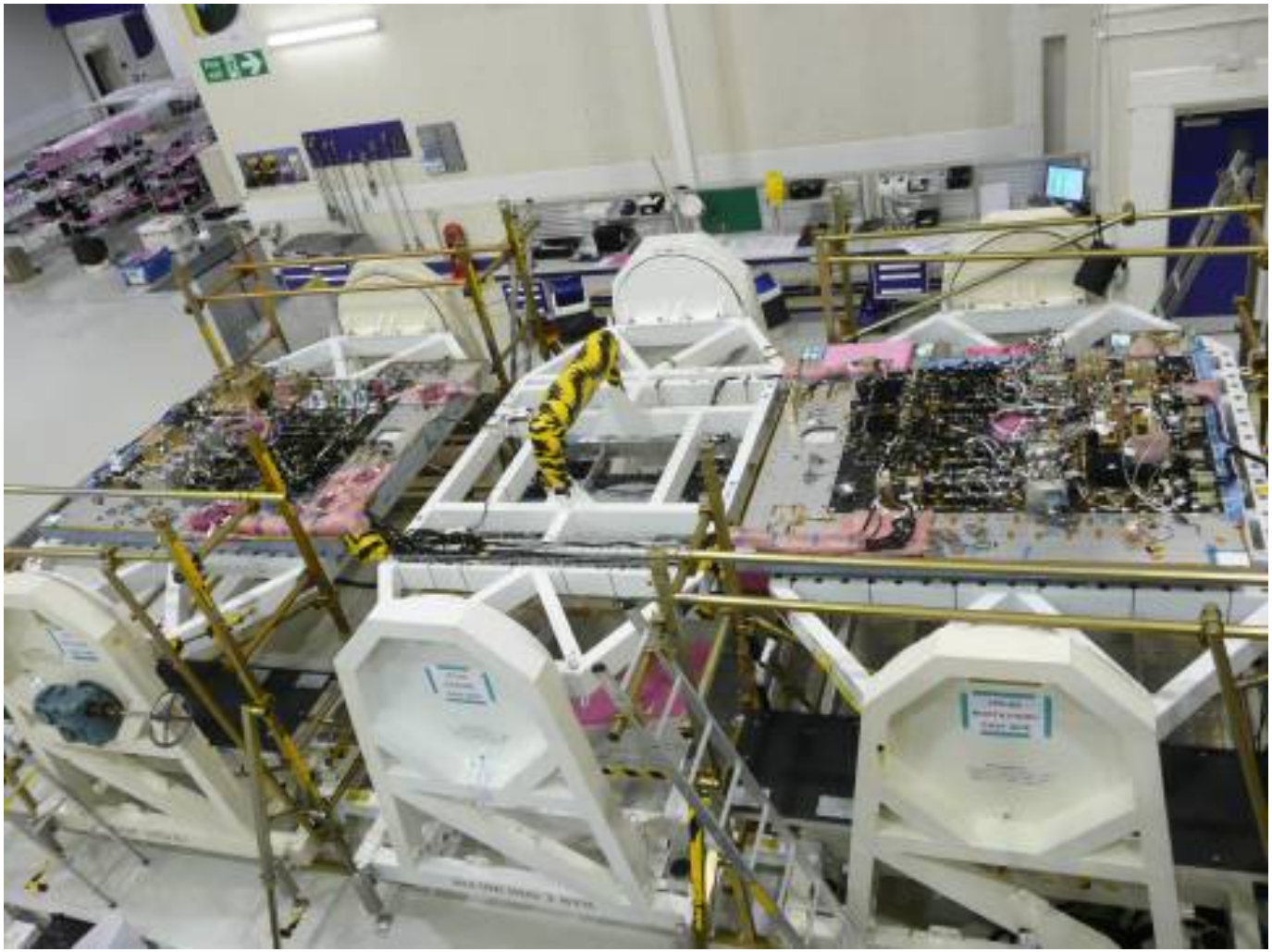
Ka band Gateways: Goonhilly and Lands End



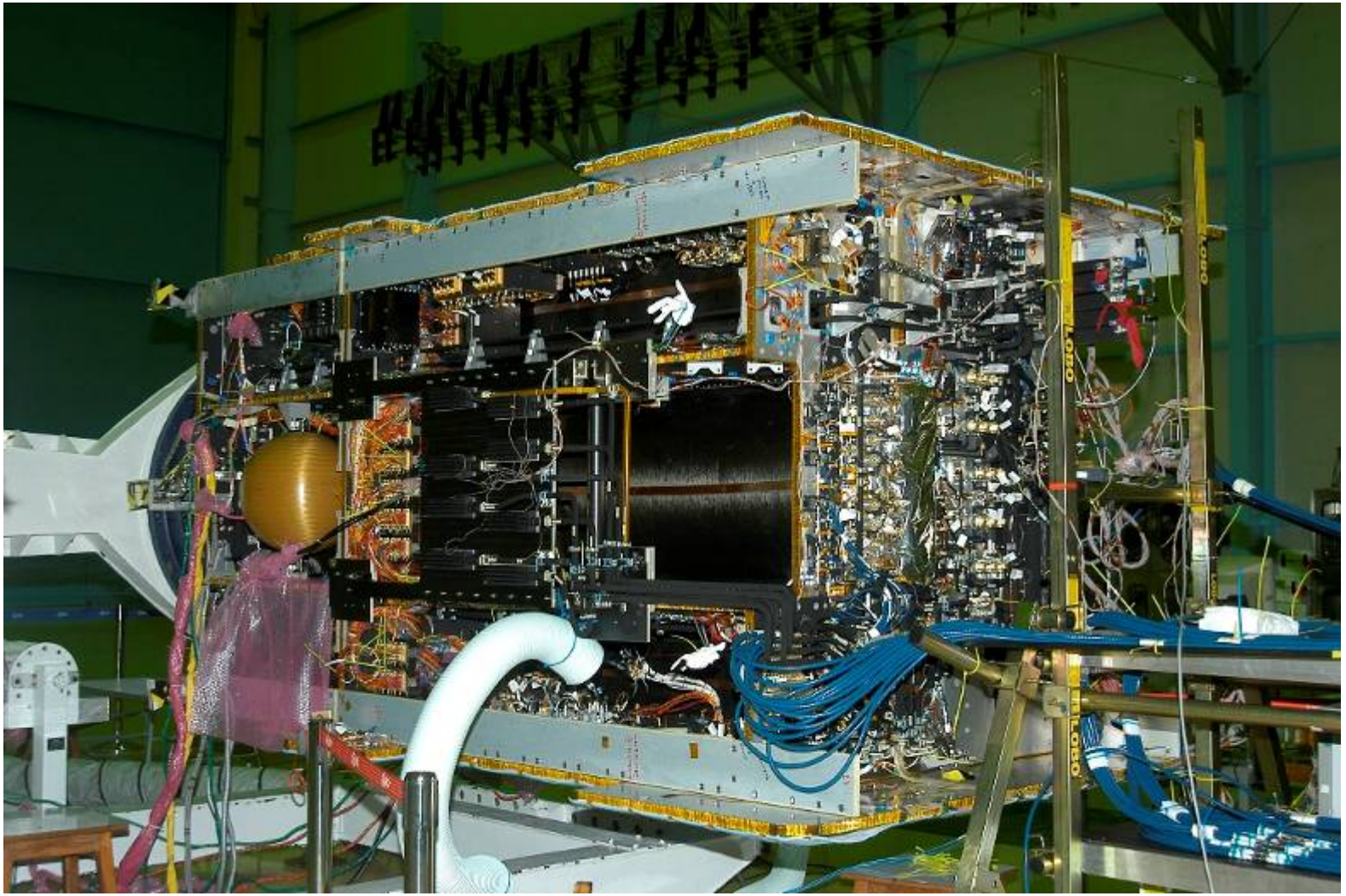
A brief history of Hylas



Repeater testing in Portsmouth



Satellite tests in January 2010 (India)



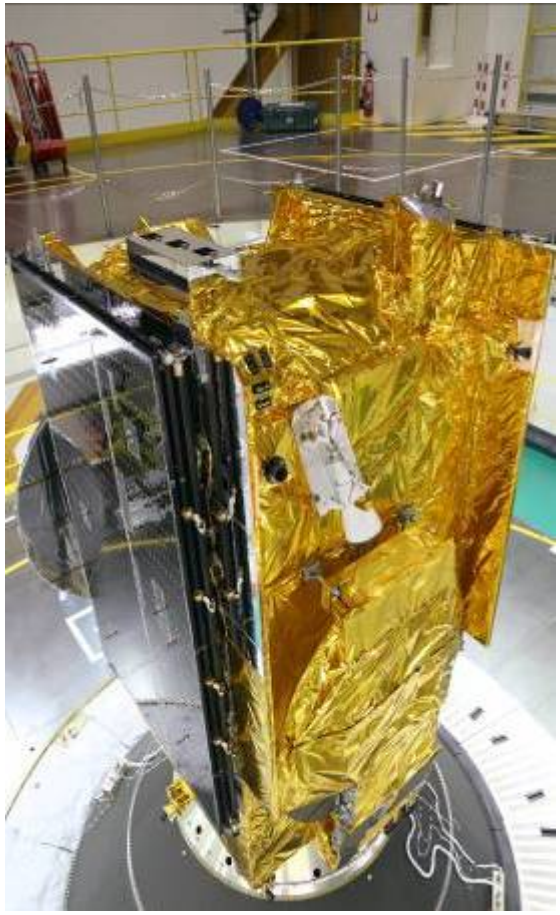
Ka-band reflector deployment (India)

Final tests in India

Arrival in Cayenne

North solar array deployment in Kourou

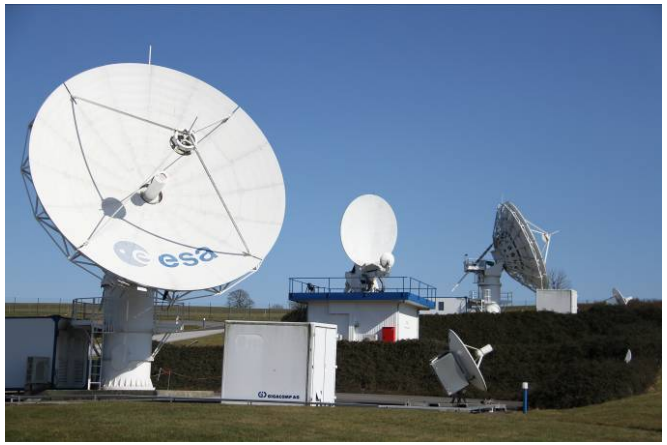
Hylas-1 on Ariane 5: final mate



Roll out to launch pad

Lift off

Redu Facilities



Ku and Ka band IOT antennae

Ku-band (foreground) and Ka-band (background) antennae in Redu

System Acceptance Tests

Hylas-1 Ka band gateway in Goonhilly during System tests

Web browsing ESA telecom portal via Hylas-1

THANK YOU

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