



## SPACEPORT CAPABILITIES

### KEY OFFERINGS

#### Operations

- Telemetry facilities
- Launch pad maintenance
- Trajectory systems
- Ground stations
- Procedures & config mangement
- Mission operations

#### Systems & Software

- Launch management systems
- On-board software
- Flight dynamics software
- Integrated satellite systems

#### Services

- Microgravity brokering
- Large-scale space infrastructure
- End-to-end launch
- In-orbit satellite control

#### Consulting

- Launch site studies
- Trajectory modelling
- Mission studies
- Microgravity market analysis

### BACKGROUND

Low-cost access to space is a key UK goal in order to stimulate economic growth in the space sector, with the UK government's stated ambition to realise a space launch from UK soil by 2020.

Telespazio VEGA UK (TVUK) have recently won two key contracts to conduct studies on an affordable launch management system, and perform a microgravity market analysis. This, combined with existing world-leading spaceport capabilities of requirements & design through to development, launch, operations and commercial exploitation, is positioning Telespazio strongly in the establishment of a spaceport in the UK.

## LAUNCH MANAGEMENT SYSTEMS



TVUK have recently been successful in winning a contract, co-funded by the UK Space Agency and internal investment, to design a highly configurable launch authorisation system that could be used to control multiple launch sites across the UK.

This contract builds on our experience in developing the Jupiter 2 Control Centre at the

Guiana Space Centre (launch site for Ariane 5, Soyuz and Vega rockets) and involves a re-design of the system implementation and operator interfaces. When complete it will provide system monitoring for 30+ operators with its key function being to interface with all systems at the launch site and stop / start the countdown accordingly.

## ON-BOARD LAUNCHER SOFTWARE



Telespazio had been developing on-board software successfully since the mid 1990's. Capabilities involve guidance, navigation & control, thrust vector control, roll & altitude control system, inertial reference systems, telemetry, integrated power distribution unit, multi-functional unit, failure detection, and isolation & recovery functions. Key flight heritage includes:

- Automated Transfer Vehicles (ATV), which was an unmanned re-supply spacecraft developed by ESA to supply the International Space Station between 2008 and 2014
- Vega, which is ESA's launch vehicle dedicated to small payloads (<1.5 tonnes) with 9 out of 9 successful launches since the first flight in 2013

## LAUNCH AND SATELLITE OPERATIONS

Launch operations: ~200 Telespazio staff work on site to support operations at Europe's Spaceport at the Guiana Space Centre in Korou. We provide operations and maintenance of: telemetry facilities, localisation & trajectory systems, telecommunications infrastructure, the Diane ground station, and the 3 pads which host the 3 ESA launchers of Ariane, Soyuz and Vega. We also provide documentation and configuration management regarding operations procedures and processes.

Satellite Operations: Telespazio is one of the world leaders in the supply of In Orbit Control services for launch, early orbit phase and routine operations (LEOP, in-orbit testing, re-positioning, mission operations) during the working life of satellites in low, medium

and geostationary Earth orbits. These services are provided by means of proprietary ground elements: satellite control centre, flight dynamics systems and ground stations, together with all the necessary teleports facilities (systems, communications, logistical & security facilities).

## MICROGRAVITY SERVICES

Telespazio VEGA UK has been successful in winning a contract funded by the European Space Agency (ESA) to perform a comprehensive analysis of the European microgravity user community and their needs, across both academia and private companies, and the platforms that are emerging and already available that can meet demand.

This well complements Telespazio's microgravity brokering service which supports research and commercial customers in finding affordable flight opportunities. After initial inquiry our end-to-end package of services covers each key step of a suborbital flight, such as payload assessment for optimal platform selection; legal, regulatory and fiscal requirements; logistical and integration services; and operations support from pre-launch through to payload recovery.



## SERVICE PROVISION OF LARGE-SCALE SPACE INFRASTRUCTURE

Telespazio can demonstrate the successful provision and operation of large scale space infrastructure services. In Italy Telespazio operates through its Fucino, Lario, Matera, and Scanzano Space Centres. The Fucino Space Centre (pictured right) has been active since 1963 and today covers 370,000m<sup>2</sup> with 170 antennas. Fucino carries out in-orbit satellite control and telecommunications for television and multimedia services. It also hosts the control centre of the COSMO-SkyMed Earth observation satellite constellation, and one of the control centres that manages the European Galileo satellite positioning & navigation system. Telespazio also operates its own teleports in Brazil, Argentina and Romania, the Creil and Maysons-Lafitte stations in France, and the Italian Space Agency's Broglio Space Centre in Kenya.