

# GÖKTÜRK

The Earth observation satellite programme of the Turkish Ministry of Defence

The GÖKTÜRK-1 programme has provided the Turkish Ministry of Defence (SSM, Savunma Sanayii Müsteşarlığı) with an Earth observation system, with a satellite equipped with a high-resolution optical sensor and a centre for the integration and testing of satellites located in Ankara. The satellite will be operated by the Turkish Air Force.

The GÖKTÜRK-1 programme is managed by Telespazio as prime contractor and system integrator, by Thales Alenia Space for the construction of the satellite, and by local industrial partners including TAI A.S., Aselsan A.S., Tubitak BILGEM and Roketsan A.S.

Telespazio, responsible towards the SSM for the programme, has created the ground segment, including the capabilities for the mission control and in-orbit satellite management, and the acquisition and data processing systems. Thales Alenia Space created the observation satellite equipped with a high-resolution optical sensor and the centre for satellite integration and testing in Ankara, inaugurated in 2015.

The European Space Agency's VEGA launcher, built in Italy by ELV, formed by AVIO (70%) and the Italian Space Agency (30%), was selected for the launch of GÖKTÜRK-1.

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### Telespazio's role

As prime contractor and system integrator, Telespazio has been responsible for the entire ground segment, both fixed and mobile, which will provide the in-orbit management, and the data acquisition and processing. Telespazio is also responsible for the launch services, early orbit phase, and testing of the satellite.

A joint venture with local partners will be established to develop and market GÖKTÜRK-1 data and application services. Turkish industry was involved in the design and development phase of the system and in the supply of certain subsystems. In particular, local partners contribute to the creation of the Data Acquisition Station, the Satellite Integration Centre, and the acquisition programming systems for processing and storing the images.

### The Role of Thales Alenia Space

In addition to the design and construction of the satellite, Thales Alenia Space built the integration and testing centre in Turkey, an infrastructure designed to integrate and test several satellites simultaneously. The GÖKTÜRK-1 satellite, based on the evolution of the Proteus platform developed by Thales Alenia Space, is equipped with a high-resolution optical instrument (PAN 50 cm/MS 2 m), the result of the company's deep experience in this field, specifically derived from the Pleiades technology.

As part of the GÖKTÜRK-1 contract with Telespazio, Thales Alenia Space is the first company in the space sector to provide a comprehensive Centre for the integration and testing of satellites. The Class 100,000 clean rooms, covering an area of over 3,000 square metres, will house all the latest generation equipment needed for the integration and testing of satellites. The systems include a test bench for mechanical vibrations (shaker), a 950 cubic metre room for acoustic tests, a 350 cubic metre thermal vacuum chamber, a testing ground for compact antennas, and supports for the deployment of solar panels and antennas. Other resources include a system for testing the physical properties of the satellites (weight, centre of gravity, inertia) and verification systems for electromagnetic compatibility (EMC).

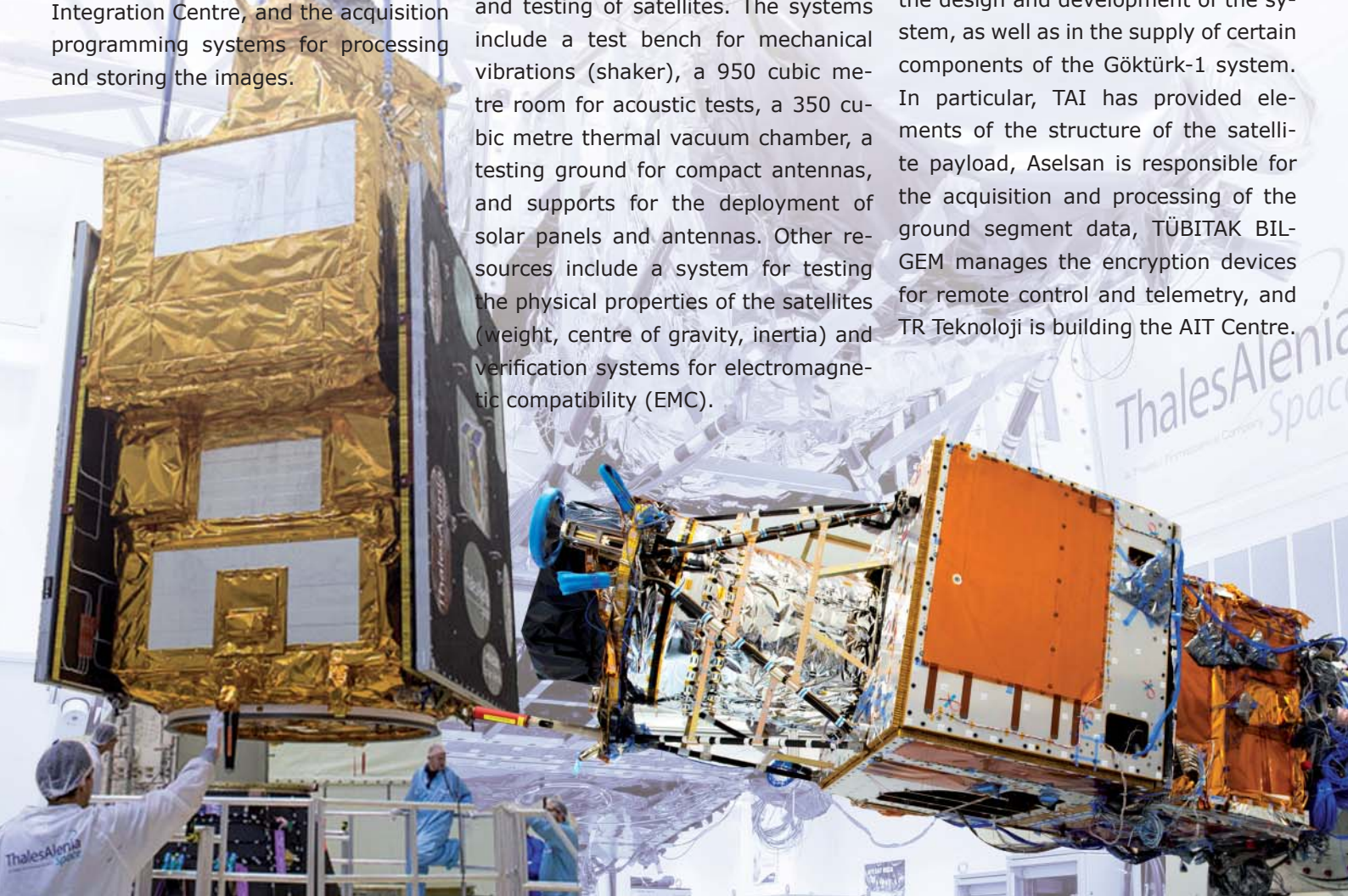
### Satellite features

The GÖKTÜRK-1 satellite, net of the propellant, weighs about 1000 kg and has been designed for an operational lifetime of at least seven years.

Its observation payload includes a high resolution optical instrument and an onboard X-band digital imaging system to handle data compression, storage and downloading. From its sun-synchronous orbit at an altitude lower than 700 km, the satellite's revisit time over Turkey will be less than two days.

### Partners

The local industrial partners of the programme are TAI, Aselsan, TÜBITAK BILGEM, Roketsan and TR Teknoloji. Turkish industry has been involved in the design and development of the system, as well as in the supply of certain components of the Gökürk-1 system. In particular, TAI has provided elements of the structure of the satellite payload, Aselsan is responsible for the acquisition and processing of the ground segment data, TÜBITAK BILGEM manages the encryption devices for remote control and telemetry, and TR Teknoloji is building the AIT Centre.



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