Space technology

Bumper number of satellite supports at Hartebeesthoek site

Expertise, experience and extraordinary levels of commitment were in high demand at the CSIR Satellite Applications Centre during December 2007 when its launch team was called to provide support for three satellites.

Frikkie Meyer, Kowie Viljoen, Carlos de Oliveira, Pieter van der Merwe, Yunus Bhayat and Rudi Kamstra of the CSIR Satellite Applications Centre ensured excellence in launch support during December 2007

Following the launch support of Sirius 4 on 18 November 2007, the team engaged in orbit testing for the period 2-23 December 2007. Sirius 4 is a multi-mission Ku/Ka-band satellite for broadcast and broadband services in the Nordic, Baltic, central and eastern European markets. The CSIR's role was vital in verifying the integrity of the communication payload as well as the satellite platform to ensure that the satellite was operational at the beginning of January 2008.

On 9 December 2007, United Launch Alliance (ULA) launched its Delta II 7420-10, carrying the COSMO-2 satellite from Vandenberg Air Force Base (VAFB), California. The CSIR was responsible for collecting and relaying the following events back to VAFB: restart ignition, second engine cut off, launch vehicle attitude manoeuvre (aligning the spacecraft to the proper spacecraft separation attitude) and finally spacecraft separation.

COSMO-2 is the second of four COSMO-SkyMed (Constellation of Small Satellites for Mediterranean basin Observation) satellites. Thales Alenia Space Italia developed this programme for the Italian Space Agency and the Italian Ministry of Defence. It is an end-to-end earth observation dual-use (civil and military) system comprising four medium-sized satellites and supporting ground stations for orbit control systems and data reception and processing.

The system will take imagery of the earth using an X-band synthetic aperture radar instrument capable of operating in all visibility conditions at the request of institutional and commercial users, including members of the civil, scientific and defence communities.

The Delta II is the 7420-10 version, a two-stage vehicle that includes four strap-on solid propellant rocket motors. The Pratt & Whitney Rocketdyne RS-27A main engine on the first stage was powered by liquid oxygen and RP-1 (kerosene).

Finally, the long-awaited Horizons-2 launch support took place on 21-25 December 2007. An evening launch of an Ariane 5 rocket from the French Guiana launch pad of Kourou on 21 December deployed two communications satellites serving populations in Africa and North America. Horizon required that the CSIR support the transfer orbit period of the Horizons-2 spacecraft.

Transfer orbit support is the transferring of a spacecraft from launch orbit to a GEO stationary position after launch.

Operated by Horizons-2 Satellite, LLC (a joint company founded by Intelsat and JSAT Corp, a leading Japanese satellite operator), Horizons-2 will broadcast high-definition television and broadband internet services to customers across the continental United States, southern Canada and the Caribbean. The 5 079-pound craft was manufactured by Orbital Sciences Corp.

With its suite of 20 Ku-band transponders, Horizons-2 will augment current services for US customers by increasing data quality and bandwidth. A planned 15-year operational mission early next year begins after the craft parks itself in the geostationary satellite belt above the equator at 74° west longitude.

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top