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Author: Mr. Stephan Roemer
Astro- und Feinwerktechnik Adlershof GmbH, Germany

Mr. Silke Eckert
Astro- und Feinwerktechnik Adlershof GmbH, Germany

FUTURE USE OF THE TET-PLATFORM AND IT'S TECHNOLOGY FOR HIGH PERFORMANCE LEO-MISSIONS

Abstract

The TET-1 satellite bus was designed as a high performance, modular and flexible microsatellite for LEO applications, with a typical launch as a piggyback payload. Typical missions are technology demonstration and earth observation missions. The first mission for this satellite bus was the TET-1 mission which was part of the OOV program of DLR. Kayser-Threde was the prime contractor for this mission, Astro- und Feinwerktechnik is responsible for the satellite bus and DLR-GSOC for the ground system. The launch was provided by Lavoshkin with an SOYUS/FREGAT launch at July 2012. Meanwhile the OOV-mission has ended, but the satellite is still under full operation, because it was handed over to the DLR's FIREBIRD-Mission. This FIREBIRD-mission is a scientific IR-Earth Observation constellation for forest fire and also non-fire applications, e.g. urban management, which will operated by DLR-IOS during the next years. The next satellite build on the TET-1 satellite bus is the BIROS, the second FIREBIRD satellite, which will be launched in early 2015. The proven concept of TET-1 was slightly updated during the TET-2 Phase-A study and is used for different proposals at ESA and other customers. This design will be the future baseline for additional technology demonstration missions. Additional to that the experiences and technologies from TET will be used from Astro- und Feinwerktechnik for the German DEOS project, where the target satellite is under responsibility of Kayser-Threde and Astro- und Feinwerktechnik. This challenging mission is lead by Airbus Defense and Space and will show the orbit servicing and de-orbit capacities of the German space industry. Although the system is a 350 kg satellite, the micro-satellite experiences and design advantages are also used for this system, especially for the high agile and flexible Attitude Control System. This system allows different modes like 3-axis stabilization, spinning configurations with and without nutation as well as controlled and un-controlled (but detected) tumbling around two or three axes. Due to the success of the technologies and products during the OOV mission, especially at the Attitude control system, the systems used in TET-1 are now in use or baseline for use in different European, Asian and US satellites. Primary factor for this is the intelligence that is integrated into the components (to reduce the working load on the board computer), as well as system design, the compliance to the ESA requirements as well as the competitive price. The presentations will show the actual status of planned projects based on TET, actual running projects as BIROS and DEOS, and some bigger co-operations in the field if use of the TET-technology (e.g. AOCS components) and their derivates in the international micro- and small satellite community.