AEROSPACE VEHICLES

Space Rider: Space plane and reusable satellite

Space Rider is the operational version of IXV (Intermediate eXperimental Vehicle) demonstrator which flight took place on 11th February 2015. This vehicle is recoverable and reusable up to five times. Launched by Vega C, it will stay in orbit between two and six months. Microgravity experiments, Earth and space observation will be part of possible missions. It will also enable to test new technologies in space conditions before applying them to satellites.

First launch is scheduled at the end of 2021.

For this Esa programme, with Thales Alenia Space-Italy as Prime contractor, the Company is deeply involved in form design and aero/thermodynamic.

Daneo Prompt Informer: Ultra responsive disposal of space sensors

The aim is to orbit very rapidly a selection of space sensors (observation, signals intelligence, alert…). Last stage of the rocket is in fact the spacecraft equipped to collect real-time data. The mission is feasible in less than 48h, from reduced ground infrastructures, anywhere on Earth.

The system is based on two Falcon 2000, identically featured: one being the carrier and the other one the escort performing launch base's functions. In addition to this intrinsic redundancy, aircraft are adaptable in order to transport launcher's elements (stages under the aircraft and inert parts in the aircraft), freight or passengers.

Dassault Aviation deals with all aspects linked to aircraft, the launcher being considered as an external load.

Iris and Artemis: transport service for orbital stations

Iris is a reusable vehicle designed to perform regular services for space stations in low or geostationary orbits, to bring freight up and back..

It is placed instead of the upper sage of a launcher for the ride up and comes back on Earth autonomously.

Artemis is the manned version for three passengers.

PYROTECHNICS ACTIVITIES

Aircraft pyrotechnics

Dassault Aviation has used its pyrotechnics expertise to ensure crew safety. Using dedicated components, the company develops ejection seat ignition systems, inter-seat sequencing systems for twin-seat airplanes, and canopy break-away and cutting systems for its military aircraft.

Based on its skills, the Company developed external loads separation and is offering new equipment such as:
- A new generation of cartridge, adapted to all recent aircraft ejector types used by the French Air Force, and needing a low level maintenance. In addition, it is compatible with high electromagnetic ambiances,
- An ejector adapted to the new generation of missiles for Rafale fighters.

Launcher and satellites pyrotechnics

Building on the high quality of its military aircraft hardware, Dassault Aviation has developed components and equipment specifically for Ariane and Vega European launchers, and for the payload fairing of one version of American launcher Atlas V. The Company designs and produces complete pyrotechnic kits including initiation and transmission devices, as well as terminal functions for launchers, and initiators and bolt cutters for satellites and probes. All equipment are ITAR free.

Digital pyrotechnics

Dassault Aviation develops innovative systems based on digital technologies used for the sequencing, command and order distribution. Orders are transmitted through digital buses to each smart initiator directly settled on pyrotechnic terminal functions. These buses replace the current pyrotechnic cords for transmission. Smart initiators include functions as mechanical safety barrier, energy storage, time delays…

This disruptive technology has many advantages, such as cost reduction, self-sustainability for energy and safety, testability, flexibility, precision and minimization of pyrotechnical products need. It simplifies integration, maintenance and refurbishement.

First application is foreseen on a reusable launcher demonstrator for CNES.

Operational capabilities make this system a good candidate for use on the future evolution of Rafale military aircraft. It could also be applied to stratospheric balloons, new launchers or space planes.

FUTURE OF COMMERCIAL SPACE

Operator of space planes

In between air and space a new market is rising where « going much faster and further » rhythms with « being more clean and sustainable ».

Dassault Aviation intent to merge its skills in business jets, complex operational systems and space to contribute to the invention of the profession of operator of space planes.

A first case of application could be dedicated to operation of the Space Rider space plane of European Space Agency.

GEOfarm

GEOfarm is an infrastructure in geostationary orbit, starting embryonic and automatic by 2025, by in orbit assembly of new generation satellites, then man populated from 2030 for recycling at the best from lots of costly wrecks.

GEOfarm is an opportunity to develop, quickly and at low cost, in public private partnership, a strategic autonomy for Europe with an emblematic European programme. The concept gathers the European skills acquired in Artificial Intelligence, Robotics, Cyber and Space, for the benefit of a key role in the huge marked of worldwide intercommunication.

GEOfarm could become the 3rd of the European large programmes, after Galileo and Copernicus, focusing on geostationary orbit our efforts and our running programmes, orbit which will remain strategic.

The challenge of Dassault Aviation is to actively contribute to the expected reconciliation of aeronautics and space sectors, paving the way to space planes and other vehicles, would they be suborbital, orbital, reusable, cargo or crewed, for civil or for military applications.

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