- CREATING OUR FUTURE IN ORBIT
OHB Sweden AB, a member of the OHB Group, is a provider of complete space missions as well as spacecraft subsystems. With more than 30 years of proven success (previously as the Space Systems Division of SSC) from a wide range of space missions in low and geostationary orbit as well as spacecraft for interplanetary missions, OHB Sweden has acquired a first-class reputation offering reliable and innovative solutions to its customers.

Building its success on the passion and exceptional talent of its employees, its extensive knowledge base, and a vision to contribute to all European space projects, OHB Sweden stands stronger than ever to take on new innovative space missions together with its ever growing network of partners and customers.
CORE COMPETENCE AREAS:
- Mission Architecture and Analysis
- Spacecraft System Engineering and Integration
- AOCS
- Propulsion
- Checkout and Ground Control Systems
SPACECRAFT
OHB SWEDEN AS PRIME CONTRACTOR

SMART-1 Europe’s first Moon probe developed by OHB Sweden on behalf of the European Space Agency - ESA. The mission successfully demonstrated Electric Propulsion for deep space applications.

Astrid-1 Sweden’s first microsatellite—carried an Energetic Neutral Atom analyser, an Electron Spectrometer and two UV imagers for imaging the aurora. Astrid-2 Sweden’s second microsatellite—explored electric and magnetic fields in the upper ionosphere.

The Viking and FREJA magnetospheric research satellites, and the TELE-X telecommunication satellite, all contribute to the OHB Sweden heritage.

The ODIN satellite was designed and developed by OHB Sweden on behalf of the Swedish National Space Board and the space agencies of Canada, Finland and France. Launched in February 2001, Odin still delivers valuable data to the science community. The PRISMA satellites have successfully demonstrated different sensor technologies and navigation strategies for Rendezvous and Formation Flying in space.

In the InnoSat project, the innovative satellite design will meet scientific demands while maintaining a low price. In addition to the direct benefit to the Swedish science missions, this low cost satellite will be offered to the global market.

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AOCs
- Attitude and Orbit Control Systems

OHB Sweden develops satellite guidance, navigation and control systems for innovative space projects. Our engineers are committed to achieving the highest standards in meeting our customers’ expectations of successful space missions. With extensive experience in spinners, low cost- and high performance 3-axis control systems, sensor technologies and navigation strategies for Rendezvous and Formation Flying in space, OHB offers world leading technological innovative capabilities within AOCs.
COMBINED SOFTWARE DEVELOPMENT METHODS

Scrum, Kanban, mixed methods... a broad selection of working methods have gained popularity within software development. Christian Ridderström, AOCs software architect for the EDRS-C satellite, answers questions about work methods at OHB Sweden.

WHICH WORK METHODS DO YOU PRACTICE IN THE AOCs DEPARTMENT?
At OHB Sweden we are influenced by agile development methods and scrum in particular. We allow work practices to vary for different projects in order to best cope with the challenge at hand. Our development culture incorporates elements and structures from the waterfall method, for instance. As a standardised, planned and structured way to develop software, we use model based development, combined with automatically generated (flight) code and testing in all of our teams a cross the organisation, as a standardised way to develop software.

HOW DO YOU EMPLOY THESE DEVELOPMENT METHODS IN PRACTICE?
Some projects are run in a “clean” scrum fashion, whereas others use a combination of traditional waterfall and scrum. The teams that combine the different development methods embrace agile concepts such as continuous integration, integrated testing, cross-functional teams, morning stand-up meetings etc. But keeping to the ECSS standard, can require more of a waterfall-like approach.

WHAT UPSIDE DO YOU EXPERIENCE BY ALLOWING FLEXIBILITY IN THE WORK PROCESS?
Freedom of choice and ability to influence your development culture, increases motivation, creativity and innovative thinking. It also promotes a greater feeling, personal responsibility, inspiring our employees. Our goal is to continuously improve the way we work and inflexible and over-controlled methods, would hamper our culture of flexibility and innovation.

However, too much flexibility and too many options during development can also be distracting. So we strive to create a balance between waterfall and agile/scrum, incorporating good practices into process guidelines. We also prefer that the team decides on development methods early in the development process, since having a known process supports less experienced developers, as well as new team members.
What does it take to develop tomorrow’s software?

We don’t know. That’s why Hansoft is flexible to adapt to your ways of working, whether it’s Agile, Kanban or Gantt. Yet it’s scalable and powerful enough for the most complex environments.

“Hansoft is used within OHB Sweden both for Agile and Schedule driven development as well as for managing External subcontractors. The tool is very intuitive and easy to use and provides the possibility to continuously fine tune the distribution of tasks and workload.”

Head of the Attitude and Orbit Control Systems & Software department, OHB Sweden

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A LEADING PROPULSION SUPPLIER

OHB Sweden is one of Europe’s leading propulsion suppliers. Our knowledge and experience cover the complete range of different propulsion systems: electric propulsion, liquid propulsion as well as cold gas propulsion. We are able to understand and define the propulsion system, from the very early project stage and throughout the development and operating phase.

For the European Space Agency’s successful pioneer mission to the Moon, the SMART-1 mission, OHB Sweden implemented the highly efficient propulsion technology. In the demanding SmallGEO telecom satellite product line, OHB Sweden is providing the electric propulsion subsystem.

To enable the most recent addition to the SmallGEO product line, the full EP Electra platform, an electric propulsion subsystem is mandatory as it provides both the orbit transfer and station-keeping abilities, resulting in a significant mass saving and consequently larger payload mass.

For the ESA Solar Orbiter mission, OHB Sweden provides the chemical propulsion subsystem together with Airbus DS.

OHB Sweden offers in-house manufacturing and assembly of propulsion systems.
FEATURES AND BENEFITS OF THE RAMSES CONTROL SYSTEM

- Open network interface (UDP) with loosely coupled modules.
- Distributed network architecture.
- Data available on all levels for debug purposes.
- Easy integration with cooperating subsystems and COTS applications.
- Support for ECSS PUS such as onboard command scheduling monitoring, command verification monitoring, and event monitoring.
- Accommodates design and construction of user specific Mimic-boards.
- Automated procedure execution (PLUTO).
- Synthetic parameters [SPEL].
GROUNDS SYSTEM & OPERATIONS

For the last 30 years, OHB Sweden has built its own applications for monitoring and control of different space projects. As missions became more and more advanced, an efficient monitoring and control system became necessary.

RAMSES (Rocket and Multi-Satellite EMCS Software) is a new generation general control system, developed by OHB Sweden, which includes the core functionality of a mission control system while offering great advantages compared to other control systems available on the market. The system can be applied to both satellite and sounding rocket missions and is designed to be used during all the phases of a space project, (development, integration, validation, and operation), thereby significantly decreasing project costs.

The Odin satellite operated by OHB Sweden in orbit since February 2001.

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FACILITIES

OHB Sweden relocated to new facilities in Kista, Stockholm in January 2014. The new facilities will allow OHB Sweden to even further increase its efficiency and quality level. With more room for expansion, a more efficient layout of the development, process and manufacturing area, including cleanroom testing capabilities, this is an important milestone in OHB Sweden’s development. All parts of the facility are approved in accordance with ISO class 8, and upgradeable to class 5.
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CORPORATE IN BRIEF

- OH B Sweden AB (previously the Space Systems division of SSC) is a member of the OHB Group.
- OHB Sweden develops, builds, tests and operates satellites and subsystems for different kinds of space missions. OHB Sweden is also proud of its ability of taking an active role in the actual creation of missions together with end users.
- The headquarters of OHB Sweden in Kista is home to 70 highly qualified engineers with experience from 11 highly successful space missions.
- OHB Sweden customer base is space agencies and leading national and international companies.

Cover: Real picture from space of Tango, taken by PRISMA’s mother ship Mango.

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