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Vlaamse Ruimtevaartindustrie
VRI Flemish Space Industries

NEWSLETTER

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EDITORIAL

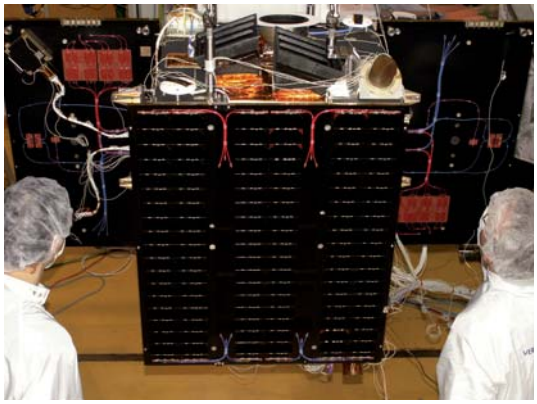
Columbus and Jules Verne get company

Twenty five years ago Europe decided on a number of large investment projects: COLUMBUS, the European shuttle HERMES and other contributions to the International Space Station. The Columbus module is finally docked to the International Space Station and the ATV, in the meantime baptised Jules Verne, will hopefully be docked as well when you read this.
Although not all the ambitions were fulfilled – HERMES was abandoned – these large programmes meant a significant impulse for European Space especially through the international space station. This has become the largest operational worldwide collaboration project .
Also for our companies this was an important step forward. Through these programmes a number of space companies have grown and became strong SME's. But in the mean time the landscape has profoundly changed. Similar large infrastructure programmes are no longer found on the drawing tables. The large programmes nowadays are mainly focused on providing services to users, both governments and consumers. The most important examples here are GALILEO and GMES. These programmes are complemented by technology research programmes, which are within the European space sector a rather recent phenomenon but who became crucial for the further development of the market position of the Flemish companies.
None of these programmes make sense if they are not coupled with a solid space infrastructure, which is permanently completed and adapted to the new needs. This must then lead to an ideal programme mix: infrastructure, user programmes and technology development. Fortunately this was the evolution we noticed in the last decade. We hope also that this will be confirmed at the next ESA ministerial conference: further investments in infrastructure combined with a daring policy on exploration, further expansion of the user programmes and a strengthened effort for technology development. VRI supports these three pillars only if they are in balance. Targeted choices based on the Flemish companies' potential are essential to continue our growth. ■

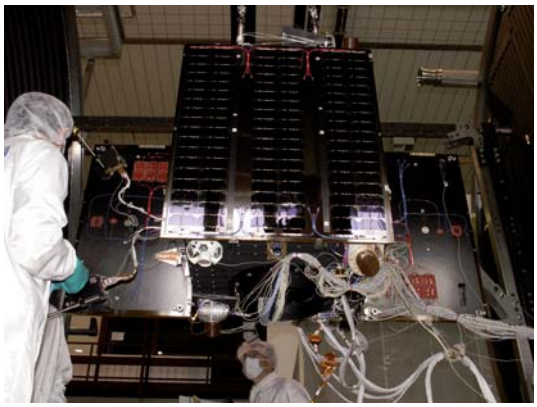
Dirk Breynaert,
president

PROBA 2 READY FOR FINAL TEST

PROBA 2, the second satellite Verhaert Space developed in assignment of ESA, has been completely integrated and has been shipped to Toulouse (Intespace) in February for the last environmental tests on system level.



End 2004, 3 years after the successful PROBA 1 launch, the first satellite ever built in Belgium, the European Space Agency (ESA) signed a contract with VERHAERT for the development and construction of a second, slightly larger satellite of the PROBA family.



PROBA 2 is a technology demonstration project and will therefore contain about 10 technology experiments next to about 4 payloads.
The PROBA 2 platform contains some improvements compared to the first PROBA, such as the increased mass, volume and power supply capacity for payloads, a new on board computer, developed in the house, a propulsion system to correct the orbit and deployable sun panels to produce more power. The new platform is thus better equipped to fulfil a complex mission.

The PROBA 2 mission has on board two Belgian made instruments for the observation of the sun. On one hand there is SWAP, a cooperation between CSL Liège and The Royal Observatory in Uccle, which will make pictures of the sun in extreme ultraviolet light. On the other hand there is LYRA of the Royal Observatory in Uccle, which will measure the brightness of the sun in UV light.

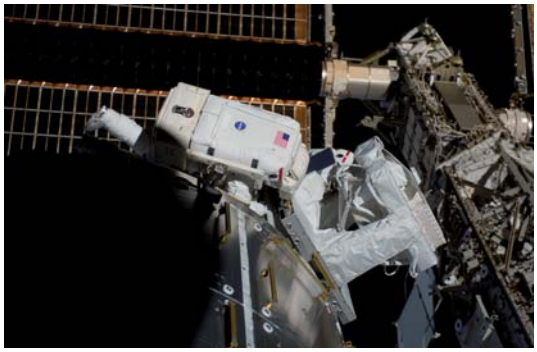
In the next couple of weeks the satellite has been submitted to the following tests in the test lab of Intespace in Toulouse
- Vibration and acoustics tests, which simulate the launch environment
- Deployment test of the sun panels
- Measurement of weight/gravity/inertia moments, which are important for the balance of the launch rocket

End of March PROBA came back at Verhaert, where the focus will be further on:
- Inspection and verification after environment tests
- Final acceptance of the flight software
- Final acceptance by the client ESA (foreseen beginning of June)

After the delivery PROBA will be temporarily stocked in expectation of the launch, now foreseen at the beginning of 2009 together with the ESA satellite SMOS. Because of problems with the Russian launcher Rockot, the launch has been postponed several times. In the mean time the commercial strategy, for which Verhaert Space has worked out agreements on one hand with Spacebel and on the other hand relies on the mother company QinetiQ, has created an important number of contacts with interested clients. So we expect to start again a new satellite project this year. ■

Frank Preud'Homme
www.verhaertspace.com

SPACE APPLICATIONS SERVICES AND BIRA CONTROL SOLAR FROM B.USOC



Rex Waldheim and Stanley Love install on 15/2/08 SOLAR on Columbus (photo: NASA).

With the launch of the European space laboratory Columbus on February 7th 2008 a new era has begun for the B.USOC (Belgian User Support and Operations Centre): during the coming one and a half year the control centre will be in permanent contact with the International Space Station (ISS) to control the SOLAR platform and the three scientific instruments SOLSPEC, SOLACES and SOVIM. For this B.USOC appeals to the services of Space Applications Services.

SOLAR
On February 15th, during the third and the last space walk of the first European ISS shuttle flight, the SOLAR platform was attached to the outside of the Columbus laboratory. SOLAR is a moving platform, following the sun automatically, on which 3 instruments are fixed: SOVIM, SOLACES and SOLSPEC. These instruments contain a series of accurate spectrometers and radiometers, which analyse the sun light over a very large spectrum:

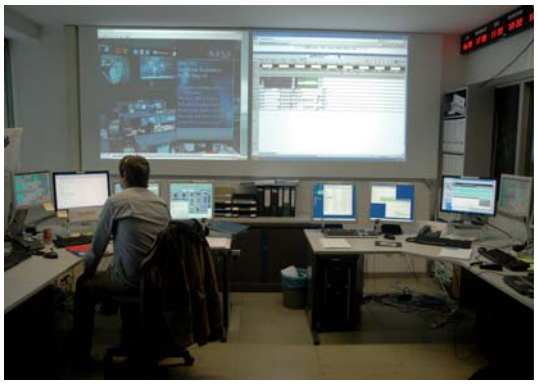
from extreme ultraviolet to the far infrared. The platform is Italian made (Alenia), whereas the instruments have been developed in Belgium, France, Switzerland and Germany.

Operations

B.USOC has the operational responsibility for as well the SOLAR platform as for the three instruments. In close cooperation with the scientists the scientific use of the instruments is prepared and executed, considering the concrete operational environment of the ISS. Therefore the control station is permanently manned and the operators are in permanent contact with the Columbus Control Centre in Munich. There are also data links with the ISS, through which SOLAR can be directly operated and followed. All received data are immediately filed and distributed so that all scientists have immediate access to all data without delay. B.USOC also houses the ground model of SOLAR, a perfect copy of the platform. Thanks to this model the operators are able to get a better insight in the functioning of the platform and they can also validate planned operations and examine eventual problems on board.

Space Applications Services en B.USOC

B.USOC is part of the BIRA (Belgian Institute for Space Aeronomy) and was created by ESA and the Belgian Federal Science Policy (BELSPO). The funding is done through PRODEX, GSTP and ESA. Space Applications Services and B.USOC are already working close together since the Odissea mission of Frank De Winne in 2002 for everything concerning ISS operations. Space Applications Services assisted B.USOC in the last couple of years in the definition and implementation of the infrastructure and operations of the ISS. The aim of this public-private cooperation is to work with fully integrated teams.



The control room of B.USOC.

Space Applications Services is also responsible, together with NLR (Nederlandse Lucht- en Ruimtevaart), for the implementation and exploitation of the Erasmus USOC, a similar control centre in Noordwijk, the Netherlands. ■

Jean-Marc Wislez

More information: www.spaceapplications.com
www.busoc.be

ABOUT OMP
ORBAN MICROWAVE PRODUCTS

OMP was founded in 1996 and has become a spin-off of the KU-Leuven after a financial participation of LRD (Leuven Research & Development) and a private investor.

We design and build a wide range of custom RF/microwave subsystems and antennas. Most of the design work is done in our lab in Leuven while assembly and test are done either in Belgium or in our office in El Paso,Texas, from where we also handle our North American marketing and sales.

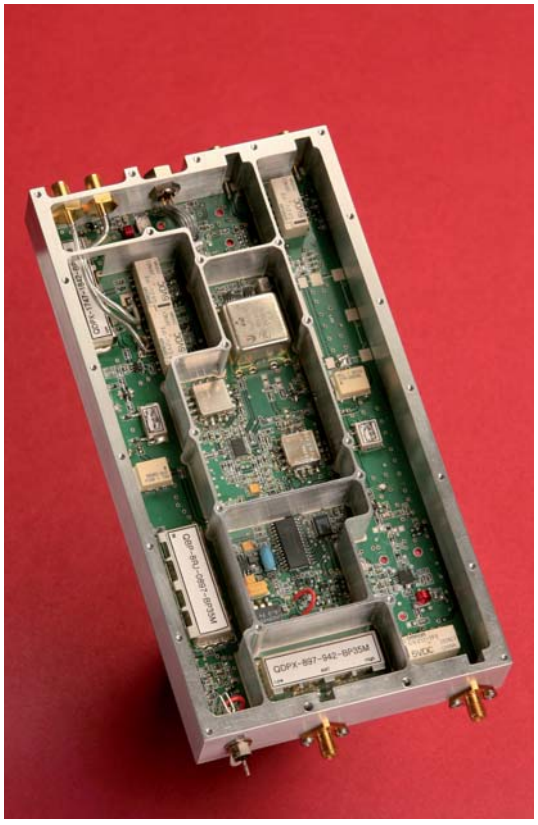
Most of our customers are located in the EU and the US and we also ship products to India, Israel and Australia. Our typical customer could not find a standard product to meet his requirements or may not have the in house design and build capability.
OMP will develop and build the product to the customer's specifications so all the systems we ship are customized to some level.

Over time we have developed a large library of RF building blocks that we use as basis for new designs. We own a complete suite of state-of-the-art simulation tools and we maintain a calibrated RF lab. We use external rapid prototyping facilities to reduce design time and cost.

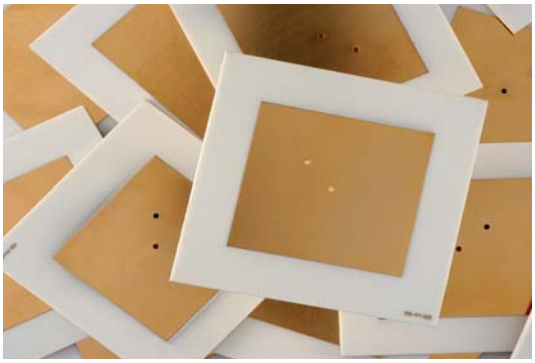
Unlike traditional design companies who turn over the design to someone else for production, OMP retains responsibility for production. In this way we support the products we design for the entire product lifecycle.

OMP was ISO certified in December 2006.

Our products are integrated in systems that target markets like avionics, space, test equipment, cellular, asset tracking, surveillance and security, satellite communications, WLAN, satellite radio and GPS/Galileo.



OMP-converter



Patch-antennes of OMP OMP-converter

Some recent antenna developments include a range of GNSS antennas covering Galileo, GPS and GLONASS, antenna arrays for L, S, C, and Ka Band, and L and S-Band antennas used in satellite user terminals. We're also working on a range of RF subsystems like frequency up and down converters for VHF up to Ka band, power amplifiers, low noise amplifiers, an X-band transponder and a Ka band Doppler radar.

Our website www.omp.be has a series of product sheets that give details about some of our developments. You will be able to find us at the FIT booth in Farnborough 2008. ■

Danny Orban

Universiteit Antwerpen

ODISSEA PRIZE FOR ANTWERP EQUILIBRIUM RESEARCH

Doctorate student Kristof Buytaert (University of Antwerp) has received the prestigious Odissea Prize for his master thesis in physics about space. This prize was handed over by viscount Dirk Frimout. The prize is linked to an amount of 8 000 Euro for an educational stay in a space centre abroad.

The awarded master thesis "quantitative study of the human otolith-ocular interaction induced by different stimulation paradigms", studies the functioning of the human equilibrium in depth and models an important part of it mathematically. During the presentation the president of the jury highlighted the importance of the study of the human equilibrium for manned space, as the equilibrium has a very important influence on astronauts.

Handing over of the Odissea prize by viscount Dirk Frimout to doctorate student Kristof Buytaert (left).

Research for the benefit of Ear, Nose and Throat Medicine

Specialists attribute an important part of vertigo and disorientation to dysfunction on the level of intra-vestibular interaction, i.e. the interaction between the different movement detectors in the peripheral vestibular system, the otoliths and the semi-circular canals, located in the inner ear. Next to this, an incorrect interaction between the signals coming from the left and right peripheral vestibular system causes vertigo and disorientation as well. This physiological and physio-pathological intra-vestibular interaction has hardly been studied on humans up to now, because of the as yet limited research possibilities for the exploration of the different movement detectors.

The present research of physicist and FWO-aspirant Buytaert focuses on the stimulation of the human otolith system and the investigation of the effects of g-level transitions (e.g. the transition of micro gravity to a 2g situation during a parabolic flight, high accelerations in (fighter) planes, centrifugation, …). The objective is to provide a detailed model for the otolith function and the otolith-ocular interaction. "This model will enlarge the insight of ear, nose and throat doctors in equilibrium problems, through which they will be able to make a better diagnosis so that vertigo patients can be released quicker from their discomfort", according to Buytaert.

SIN team: (left to right) Prof dr Floris Wuyts, Dr Pierre-Francois Migeotte, Prof Nathalie Pattyn, Dr Hamish MacDougall & MSc Kristof Buytaert.

University research centre

The second part of the thesis concerns a pilot study of the ESA SPIN study. For this project, an important pillar of Buytaert's further PhD research, astronauts/cosmonauts will have to pass a series of examinations in Star City (Moscow) before and after a long term stay in space. "They aim to map the otolith-ocular and the vestibulo-sympathic interaction in a better way, as part of the countermeasures against the disadvantages of space flights (cardiovascular deconditioning, orthostatic intolerance, disorientation)." Among others the Visual and Vestibular Investigation System (VVIS-centrifuge) is used. This centrifuge was also used during the Neurolab space mission (STS-90). The 'training model' of this centrifuge is stationed in the Antwerp University Research centre for Equilibrium and Aerospace (AUREA). AUREA belongs to the department of ear, nose and throat surgery and head and neck surgery of the Antwerp University Hospital. Head of AUREA is professor of medical physics Floris Wuyts. ■

Johan Waelkens