

Europe's 'data superhighway' in space sets sail

25 June 2012

An important milestone for the commissioning of a European 'information superhighway' in space has been reached; on 25 June 2012, Johann-Dietrich Wörner, the Chairman of the DLR Executive Board, Evert Dudok, CEO of Astrium Satellites, and Gerhard Bethscheider, CEO of SES ASTRA TechCom S.A. (Luxemburg) signed contracts for large parts of the ground segment of the new European Data Relay System (EDRS) in the German Space Operations Center (GSOC) at the German Aerospace Center (Deutsches Zentrum für Luft-und Raumfahrt; DLR) site in Oberpfaffenhofen. As a result, Europe is becoming increasingly independent in satellite telecommunications. The contract runs until 2030.

More data sent to Earth faster and for longer time intervals

The planned EDRS is based on two geostationary 'distributor' satellites that, because of their fixed position in space, will be able to receive high-speed communications from low-flying Earth observation satellites and relay them to Earth without any delay. As a result, these satellites will no longer be restricted to brief contact windows when they pass over their ground stations, which is currently the case. "This will mean that significantly greater data volumes can be transmitted faster and for longer time intervals from space to Earth. Above all, this is of huge importance for environmental monitoring, for the emergency relief services, for example during natural disasters, and even for weather forecasting," explained Johann-Dietrich Wörner. The ESA EDRS programme is therefore also a central component of the ESA and EU **Global Monitoring for Environment and Security (GMES)** programme. GMES is a European initiative for worldwide satellite-based environmental and security monitoring.



Signing of the EDRS contract at the DLR German Space Operations Center. Back, from left to right: Felix Huber (Director Space Operations and Astronaut Training), Gerhard Bethscheider (Managing Director of SES ASTRA TechCom), Francois Biltgen (Minister for Justice, Minister for Communication and Media, Luxembourg), Peter Hintze (Parliamentary State Secretary in the German Federal Ministry of

Public-private partnership

Like the German radar satellite mission TanDEM-X, EDRS is also a Public-Private Partnership (PPP), but in this case, ESA is the client and Astrium GmbH the prime contractor. DLR has been appointed as a subcontractor by Astrium and is responsible for constructing large parts of the ground segment and for controlling the payloads on the first satellites, referred to as EDRS-A. DLR will also manage and control the EDRS-C relay satellites during routine flight operations that will last for at least 15 years. For this purpose, a dedicated EDRS control centre will be developed within DLR's GSOC. The two geostationary relay satellites will transmit the data collected by the lower-orbiting Earth observation satellites to a total of four receiver antennas, which will be located on the sites of the existing ground stations at Weilheim (DLR) and Redu (Belgium), and at Harwell (United Kingdom). SES ASTRA TechCom S.A. will supply the four antennas and will operate the antenna at Redu on behalf of DLR. The data links will operate Ka band and be able to relay very large volumes of data – in the gigabit range – to Earth.

First operational deployment of optical laser communications

As part of EDRS, optical laser communications technology, also developed in Germany, will be used to transmit data operationally for the first time. "The European telecommunications infrastructure will be improved significantly," said Johann-Dietrich Wörner. "With EDRS, geostationary data relay services will be available to our partners and clients worldwide operationally for the first time. The project includes developing the necessary technologies to build the infrastructure on the ground and in space and the reliable operation of the completed system."

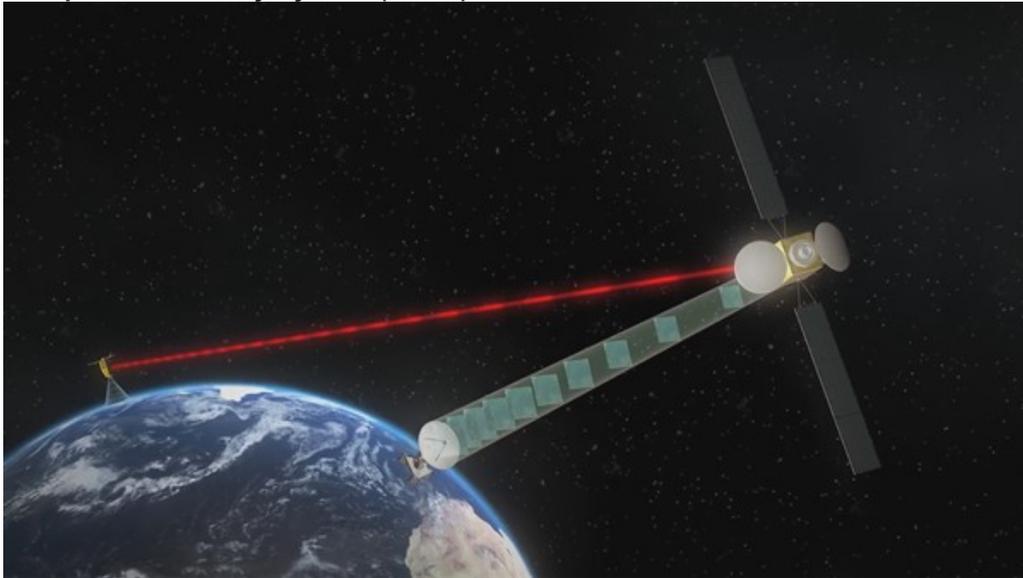
After its development phase – from the end of 2014 – EDRS will be used by the first two 'Sentinel' GMES Earth observation satellites to connect to the invisible 'data highway' in space. The Sentinel satellites will be equipped with small laser communications terminals, capable of transmitting data at speeds of up to 1.8 gigabits per second over a distance of 45,000 kilometres.

Contacts

Andreas Schütz
German Aerospace Center (DLR)
Corporate Communications, Spokesman
Tel.: +49 171 3126-466
Andreas.Schuetz@dlr.de

Dr Anke Pagels-Kerp
German Aerospace Center (DLR)
Space Administration, Satellite Communications
Tel.: +49 228 447-382
anke.pagels@dlr.de

European Data Relay System (EDRS)



The animation shows the principle of the new European data relay system EDRS.

Credit: Astrium GmbH.

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