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March 25, 2002

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DLR Calibrating Grace After Eurockot Launch

FRANK MORRING, JR./WASHINGTON

Ground controllers at the German Space Operations Center in **Oberpaffenhofen** are preparing for six months of commissioning and validation activities with the two-satellite Gravity **Recovery and Climate** Experiment (Grace) launched last week in the first commercial flight of the Euro-Russian Rockot converted SS-19 ICBM.

Launch of the gravity-measuring constellation, jointly sponsored by NASA and Germany's Zentrum fur Luft und Rumfahrt (DLR), came at 4:21 a.m. EST Mar. 17, one day late because of high winds over the Plesetsk Cosmodrome in Northern Russia. **The twin spacecraft** separated from the Rockot's Briz-KM upper stage 85 min. later and began drifting apart in their 500-km. (270-naut. mi.) high polar orbit as scheduled.



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THE SATELLITES WERE WORKING

as planned in the early stages of a two-and-a-half-week checkout period. For at least the next six months **after that controllers** are slated to carry out detailed calibration and verification of the ranging and navigation systems that will allow scientists to measure the distance between the satellites to an accuracy of about 10 microns.



Russian-built Rocket lifts off from Plesetsk Cosmodrome with U.S./German Grace gravity-measuring satellites on Mar. 17.

Those data, in turn, will help them produce the most accurate gravity **maps of the whole Earth** to date, since the distance between the spacecraft will change along with the density of the Earth below (*AW&ST* Mar. 4, p. 56). Last week the two satellites were drifting apart at a rate of 0.5 meters (1.6 ft.) per sec., aiming at an initial separation of 220 km. (119 naut. mi.).

The Grace launch was the first commercial mission for Eurockot, the consortium of Astrium and the Khrunichev Space Center that has developed the Rockot launch vehicle. The **three-stage liquid propellant rocket** combines the two-stage **SS-19** and the **Briz-KM**, a reignitable stage originally designed to launch low-Earth orbit communications constellations.

Although the next Rockot launch is scheduled to carry two replenishment Iridium LEO communications satellites, the constellation market has essentially dried up and the consortium is scrambling for business. Company executives said last week they hoped the Grace launch would give their marketing efforts a boost.

"Success is a very good argument," said one, who noted preliminary data indicated the satellite placement had been "very accurate."

Following the June replenishment launch of two satellites for Iridium ~~Satellite LLC, successor to the company whose~~ bankruptcy deflated the market Eurockot was formed to fill, Bremen-based Eurockot is scheduled to launch two satellites together in the first quarter of 2003. The Canadian Space Agency's Microvariability and Oscillations of Stars (Most) astronomy satellite will fly with the Microaccelerometric Measurement Of Satellite Accelerations (Mimosa) research satellite developed by the Czech Astronomical Institute.

The company also posts an unspecified dual launch on its manifest in 2003, followed by the dedicated launch of Japan's Space Environment Reliability Verification Integrated System (Servis-1) in the fourth quarter of 2003. A second unspecified dual launch is manifested for 2004. But that is a far cry from the company's prospects of the late 1990s, when it signed a study contract with Motorola that could have



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led to as many as 20 replenishment launches for the original Iridium, and used its \$13-15-million launch price tag to attract other LEO launch deals that have since evaporated as well (*AW&ST* Oct. 25, 1999, p. 40).

See Also:

[Orbiting Gravity Mappers Might Spot Oil Fields](#)

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