ERBS

Long life, design make mission unique

The delivery of the Earth Radiation Budget Satellite (ERBS) to Goddard Space Flight Center (GSFC) on June 4, 1984, was the culmination of three-and-one-half years of successful teamwork and the beginning of 12 years of useful information.

ERBS is a shuttle-customized spacecraft designed to gather information for long-range predictions of weather.

"Long-range predictions of weather require that we know how slight variations in sun brightness influence the weather," explains Zubin Emsley, who was the system engineer for assembly and launch. ERBS also looks at the distribution of ozone and pollutants, which also affect weather.

To accomplish this mission, ERBS carries three instruments. The Stratospheric Aerosol and Gas Experiment II (SAGE-2), built by BATC, monitors stratospheric aerosols and other constituents for their concentration and distribution.

Dust changes the Earth's energy balance, explains Emsley. "Small changes in the energy balance change the weather a lot."

A pair of instruments manufactured by TRW, called the Earth Radiation Budget Experiment, monitors absorbed solar radiation and the radiation emitted or reflected back to space by Earth.

"The satellite sees how much heat is coming up from the Earth and how much is coming from the sun," Emsley says. "That balance, called Earth's energy budget, is crucial in driving the weather."

Designed to last only two years, ERBS is still supplying important information.

"It's hard to believe it was launched in 1984," says Ron Young, who was in charge of the propulsion system and mission operations. "It is now coming up on 12 years and it is still working."

BATC was the prime contractor for the ERBS mission and was responsible for designing and building the spacecraft, integrating the three instruments and preparing for launch. Ball also conducted the mission operations for one year from GSFC's project operations control center.

"It was an unusual contract because our job included flying it after it was up there," Emsley says.

ERBS stands out in Ball's history for reasons other than its long life and BATC's role in flying it. Its physical design and launch also make it unique.

"Most satellites are round to fit into rockets," Emsley explains. "ERBS is long and narrow as dictated by the use of the shuttle cargo bay."

Previous BATC satellites were launched by rocket boosters. ERBS was the first Ball and GSFC satellite for deployment by the shuttle arm, says Young.

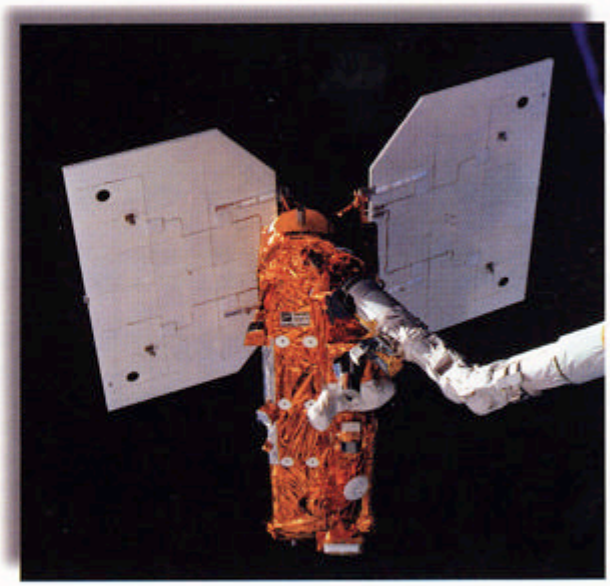
It was also the first Ball satellite that had a hydrazine propulsion system and used long, low-thrust burns to spiral the satellite into final orbit.

The thruster burn, which lasted 16 hours, 20 minutes and 26 seconds, is still the longest hydrazine burn in history, Young says.

Beyond the technical accomplishments of ERBS lies the success of teamwork.

"In my mind, it was probably one of the best industry-government team efforts ever," Young says. "It was a case where people really focused on making the mission successful." ■

By Lori Batcheller



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