

GOES-R Series Flight Data System

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The following is an excerpt from the Wikipedia entry on GOES-R:

GOES-R will mark the first major technological advances in geostationary observations since 1994.

Compared to the current GOES system, the advanced instruments and data processing will provide:

- *Three times more spectral information*
- *Four times greater spatial resolution*
- *Five times faster coverage*
- *Real-time mapping of total lightning activity*
- *Increased thunderstorm and tornado warning lead time*
- *Improved hurricane track and intensity forecasts*
- *Improved monitoring of solar x-ray flux*
- *Improved monitoring of solar flares and coronal mass ejections*
- *Improved geomagnetic storm forecasting*

These improved capabilities presented a unique set of challenges for the design of the GOES-R flight data system. Also, the ability to share GOES-R data with a diverse user community has been designed into GOES-R. And finally, GOES-R on board and space-to-ground communications has improved reliability to reduce data errors and loss.

To achieve key goals of the flight data system the GOES-R Project developed GOES-R related SpaceWire, a reliable delivery protocol, and Low Density Parity Check coding technologies. Low cost test beds were created to provide proof-of-concept to minimize program risk. All technology developed in this effort was shared with all GOES-R space segment contractors as sample hardware and software. The flight data system follows internationally accepted data system recommendations to help reduce cost and risk. The following is from the Consultative Committee on Space Data Systems (CCSDS) Web site:

Today, leading space communications experts from 26 nations collaborate in developing the most well-engineered space communications and data handling standards in the world. The goal? To enhance governmental and commercial interoperability and cross-support, while also reducing risk, development time and project costs.

With these improved capabilities and system design, GOES-R series is truly a new generation of GOES spacecraft.