

The New Galileo Communication System

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In December of this year, the Galileo spacecraft will arrive at Jupiter and begin a multi-year study of the planet and its moons. The failure of Galileo's high gain antenna deployment has resulted in four orders of magnitude degradation in the planned Earth-received signal level. In order to conduct a meaningful mission, extraordinary changes have been made to both the spacecraft and ground communication systems. These changes include a new packetized telemetry format, new error-correcting codes, new modulation, new ground receivers, antenna arraying, and extensive use of data compression. With these modifications in place, about 70% of the originally planned Galileo mission science objectives will be achieved. The modifications also serve as a prototype for communications and tracking support of future signal-constrained deep space missions.