

GALILEO'S TELECOM USING THE LOW-GAIN SPACECRAFT ANTENNA¹

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Galileo's accomplishment of a science-rich mission through a low-gain antenna was made possible by a coordinated efforts of the Deep Space Network Support team, the spacecraft designers, and the science principal investigators. This team has worked together since late 1991, its efforts resulting in the flawless transition of Galileo, on May 23, 1996, to a completely new telecommunications link.

The efforts included extensive changes in the DSN facilities in Goldstone (USA), Canberra (Australia) and Madrid (Spain) and at the Parkes Observatory in Australia, as well as new uploads of Galileo's on-board software. The DSN/Parkes upgrades include increasing the antenna sensitivity, adding wide-area arraying between the Goldstone and Canberra 70-m antennas, the Canberra 34-m antennas and the Parkes 64-m antenna, installing new error-correcting coding, and providing the infrastructure to ensure gap-free, guaranteed delivery, telemetry processing. At the same time, Galileo has developed extensive on-board data editing and compression capabilities. Together, The DSN/Parkes and Galileo upgrades increase the raw downlink volume by a factor of 10, and its value by another factor of 10, resulting in Galileo meeting 70% of the original science goals.

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