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The Cassini RADAR: instrument Description and Science
Mission Description

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The Cassini RADAR is a multimode instrument built both by NASA/JPL and ASI/Alenia Spazio. The Alenia Spazio built radiofrequency portion was integrated at JPL to the JPL built digital portion. The digital portion includes a computer whose software was written at JPL. In addition to the RF and digital units the RADAR utilizes the Alenia built Cassini spacecraft high gain antenna and the JPL built energy storage unit which acts as a battery substitute. The RADAR operates in radiometer only, scatterometer, altimeter, and imaging modes. The antenna has five radar feeds which provide wide coverage during the imaging data collection. The center feed provides a narrow beam for all other modes. The RADAR has five bandwidths to provide each mode with an optimal data collection strategy. In addition, each mode has a data compression method to best utilize the very limited data bandwidth available. Only one active mode can be used at a time so that the mode is generally selected by altitude with imaging using the closest approach peri 0(1. All data collection modes and instrument parameter selections are Set by preloaded tables generated on the ground weeks prior to a flyby, based upon predictions of surface conditions and the flyby geometry. This paper will describe this interesting, unique radar and how it will be used to collect data at Titan.