

SMALL SATELLITE MISSIONS SYMPOSIUM (B4)  
Design and Technology for Small Satellites - Part 1 (6A)

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SSTL'S ULTRA LIGHT WEIGHT COMPUTER FOR PLANETARY MISSIONS – OBC695B

**Abstract**

In October 2008 the Indian lunar mission Chandrayaan-1 was launched from the Sriharikota spaceport by the PSLV launch vehicle. The mission carries a complement of payloads including a synthetic aperture imaging radar. This payload was provided by NASA in association with the Applied Physics Laboratory (APL) and US Naval Air Warfare centre supported by an industrial team led by BAE Systems and including Surrey Satellite Technology Ltd (SSTL). This payload, known as MiniSAR, has at its heart a computer built in the UK by SSTL.

The computer is known as the SSTL OBC695 and has been developed for use in SSTL's high performance missions as either a central on-board computer or a payload processor. The first version of the computer, the OBC695A, was developed between 2001 and 2005 and flew as a payload processor on the 1st Galileo test satellite, GIOVE-A, launched 28 December 2005. For the Chandrayaan-1 mission a second version of the computer with higher radiation tolerance and lower mass and volume was developed between 2006 and 2007. This version, the OBC695B, is ideally suited to planetary missions where very high dependability requirements apply but mass and volume are at a premium due to the tough constraints of this class of missions.

SSTL's OBC695 is a general purpose computer built around the Atmel TSC695F Sparc V7 32 bit RISC processor. Similar processors have been used in space on several missions such as the ESA missions SMART-1 and the PROBA series. The OBC695 can support a variety of low-level software options including a "bare board" solution using a cyclic scheduler or with an operating system such as RTEMS or Windriver's VxWorks. The computer supports a range of I/O options including LVDS, CAN, 1553 and RS422.