19th SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Generic Technologies for Small/Micro Platforms (6A)

Author: Mr. Philip Davies
Surrey Satellite Technology Ltd (SSTL), United Kingdom

Mr. Steve O'Donnell
SSTL, United Kingdom
Prof. Martin Sweeting
Surrey Space Centre, United Kingdom
Mr. Alex da Silva Curiel
Surrey Satellite Technology Ltd (SSTL), United Kingdom

EFFICIENT PRODUCTION ENGINEERING OF SMALL-SATELLITE CONSTELLATIONS

Abstract

One of the major benefits of small satellites is the ability to build constellations due to the relatively low unit cost of each satellite. For imaging missions the constellation approach provides some major benefits in terms of area coverage, system resilience and revisit rate. In other applications such as satellite navigation a constellation is an absolute necessity for the system to operate.

When designing and building a constellation there are many "efficiencies of scale" that can be exploited by the prime contractor and the suppliers to lower further the unit cost. Given that the design of the satellites is a "non recurring" activity it can be well worth investing effort at that stage of the project in order to lower the cost of the "recurring" activities related to each satellite. This amounts to spending additional effort at the design phase to lower the cost of the manufacture, assembly, integration and test activities.

To date, SSTL has built and launched two small satellite constellations – the 100kg-class Disaster Monitoring Constellation (DMC) and the 150kg-class RapidEye commercial constellation. SSTL is currently working on two further constellations – the 400kg-class DMC3 constellation of at least 3 ultra high-resolution imaging satellites and 22 satellites of the 700kg-class Galileo Full Operational Capability (FOC) constellation.

The paper will address the lessons learned from DMC and RapidEye and how they are being applied to the new constellations of DMC3 and Galileo.