

# Richard Forster Long AMIMechE

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Member of: IMechE, British Mensa.

A bright and versatile aerospace mechanical systems engineer seeking a challenging role in the management and delivery of aerospace technologies applying experience of multidisciplinary engineering and physical sciences.

## I. ACADEMIC AND WORK EXPERIENCE

### Publications

1. *Trajectory Optimization for Reducing the Impact of Commercial Aircraft Operations on The Environment*, co-author. Cranfield University, ISABE 2009.
2. *Towards a distributed multispectral imaging system for the next generation of low cost disaster relief systems*, Long, R., SSTL, Presented at the 2011 International Astronautical Conference. Published in 'Novel ideas for nanosatellite constellation missions', IAA Book Series; Small Satellite Programs, Missions Technologies and Applications, Vol.1, No.1.
3. *Strand-1: use of a \$500 smartphone as the central avionics of a nanosatellite*, co-author, SSTL, Presented at the 2011 International Astronautics Congress.

### 2014-Present B/E Aerospace

#### **Certification Systems Engineer - A350**

Performing systems engineering and certification duties on interior structures systems.

- Testing, validation and certification sign-off of compartment air extraction systems.
- Producing and updating qualification and acceptance test procedures and their deliverable reports to Airbus.
- Ensuring design compliance with high level purchaser technical specifications (HLPTS), and airworthiness regulations (EASA CS25, FAA part 125) and company practices (ISO9000, AS9100).

### 2010-2014 Surrey Satellite Technology Ltd, UK.

#### **Senior Propulsion Systems Design and Test Engineer**

Delivering test, qualification and spacecraft-integration campaigns for three flight systems. The role requires a hands-on approach to spacecraft assembly and integration in controlled environments and clean room facilities. I am one of the engineering department's representatives to the Business Connection Forum and have acted as a mentor to new members of staff. Achievements include:

- Delivery of propulsion system for structural qualification and flight build including mechanical proof, leak and global leak (Helium) check of propulsion system in vacuum facilities.
- Work package, budget and schedule management. Test planning, execution and failure recovery.
- Designed ground-half coupling for propellant and pressurant fill drain and vent systems.
- Design and build of ground support equipment including high pressure and vacuum systems.
- Manufacture and finishing of propulsion feed tube-work including coarse and precision cleaning.
- Certified Swagelok installation engineer.
- Preparation of launch site shipment and the use of propellant loading equipment/procedures.
- Managing quality assurance using verification & testing matrices and discrepancy reporting.
- Generation and managing production BoMs, design documentation and
- Writing & management of test/qualification plans and procedures
- Drawing approver responsible for review and sign-off of mechanical components for manufacture and analysis of stress-critical parts e.g. 3D-print Titanium flexure.

**DMC-3 (DMCii UK) - Lead Propulsion Engineer:** Work package manager responsible for complete assembly, integration, testing and delivery of three Xenon propulsion systems. I participated heavily in supporting spacecraft-level work acting as deputy lead engineer for the project

**Formosat-7 (Taiwan) - Propulsion Design Engineer:** Responsible for system performance analyses, mechanical design and fabrication for a constellation of 12 200 kg class Mono-prop Hydrazine propulsion systems. I also undertook significant work in the design development of the F7 solar array drive mechanism.

**STSat (Kazakhstan) - Lead Propulsion Design Engineer:** Work package manager responsible to system requirements, specification, sizing and design development of a 100 kg class Butane propulsion system

### **Mission & Systems Engineer**

Responsible for work package management of mission concept and feasibility studies performing top-level to detailed analyses. Notable works include:

- Delivery of mission analysis for ESA's GMES security dimension;
- ESA Hybrid Propulsion Transfer Strategies study assessing the design of spacecraft and propulsion architecture for trans-lunar/-Martian orbit transfers;
- Management of TSB feasibility studies into space-based carbon asset management with external partners
- Design development of the SSTL S-POD CFRP composites Cubesat deployer.

**DSO Transceiver (Singapore):** Systems Engineer for a £3.5m payload subsystem contract, handling requirements capture and management; interface control; and customer engagement.

**Gallileo FOC:** Responsible for thermo-mechanical integration solution for the TWTA thermal isolation system for Galileo FOC payload.

**Turkish Regional Navigation System:** Technical proposal to the Turkish Government.

### **2008-2010 Cranfield University.**

#### **Clean Sky Researcher in Multidisciplinary Optimisation for Greener Aircraft Trajectories**

Supporting the industrial activities of aircraft mission and trajectory management as part of the EU €1.6bn Framework 7 *Clean Sky* project to reduce the environmental impact of commercial air traffic. The work involved the development of a genetic-algorithm-based optimisation framework for performing multi-objective trajectory optimisation and an aircraft performance code. Areas of interest include: constraint handling; improvement of aircraft performance modelling techniques; and minimum energy trajectories. The scope led to investigations into optimal descents under engine wind-milling in high bypass turbofan powerplants.

### **2007-2008 Cranfield University.**

#### **MSc in Astronautics and Space Engineering.**

**Subjects include:** Astrodynamics, Space Systems Engineering, Space Propulsion, Attitude Dynamics, Space Communications and Mission Analysis. Selected options were Control Engineering, Launch and Re-Entry Aerodynamics, Sensors & Data Fusion with GPS and INS, On Board Data Handling and Software Development, and Space Environment.

**Group Design Project:** GEO Spacecraft in-orbit Power and Propellant Servicing mission design working as the Rendezvous specialist researching optimal orbit rendezvous strategies and the design of an androgynous docking interface.

**Thesis:** Preliminary work into the definition and development of the ground control system for the Cranfield University CubeSat Project.

### **2004-2007 University of York.**

#### **Physics with Astrophysics BSc. (Hons.)**

Cosmology; Classical Mechanics; Electromagnetism; High Energy Astrophysics; Nuclear Physics; Observational Astronomy; Quantum Mechanics; Statistical Mechanics, Stellar Physics; Solid State Physics; Stars and Planets; and Thermodynamics.

Dissertation Project:

*'Interferometric measurement of laser coherence length'*

Second Year Project:

*'Jovian mass determination by observation of Jovian moons'*

First Year Project:

*'Lunar feature heights based on ground shadow observation'*

### **2001-2003 Newcastle College, Newcastle, UK**

**A-Level** Physics, Mathematics, Further Mathematics, Accountancy.

## II. PREVIOUS WORK EXPERIENCE

### **2003-2004 Cabin Crew, Easyjet Airline Company UK**

Operating on the B737-300/700. Duties included pre-/post-flight safety and security checks of aircraft cabin and equipment, cabin safety and management.

### **2003 Flight Dispatcher, Servisair UK**

Responsible for managing commercial aircraft turnarounds. Duties included planning and co-ordination of aircraft turn-around servicing, ground-aircrew co-ordination as well as preparation of relevant flight documentation. Easyjet Load Control Accreditation and UK Airside Driving Permit.

## III. QUALIFICATIONS AND ACHIEVEMENTS

### **2011 3<sup>rd</sup> Winner 'Axelspace Mission Idea Contest', Tokyo, Japan**

Awarded for my mission concept to provide Japan with a low-cost, rapid deployment, distributed multi-spectral imaging system for disaster monitoring and relief.

### **2009-Present Science, Technology, Engineering and Mathematics Network**

**Science and Engineering Ambassador** promoting science and engineering in schools across the Three Counties and Surrey. **Personal Tutor** for GCSE/A-Level Maths and Physics.

### **UK Amateur Radio Licence: M6RFL**

Completed as part of Ground Station Design effort for Cranfield University.

### **FAA Private Pilot**

256 Hours Total Time since 1997, Single Engine Land with aerobatic and EFIS experience (Garmin G1000). FAA Commercial/Instrument Rating in training.

### **2000-2001 Engineering Education Scheme & Gold Crest Award**

Working in a team of five with Telewest Communications on a project entitled 'Non-intrusive remote measurement of power supplies to equipment rooms'. The team presented its work in a regional conference and won the Nissan Rose Bowl Award.

### **Derek Esp Award for Engineering Lectures**

Awarded by Emmanuel College for my discussions on selected topics to a panel of engineers;  
1999 - '*Millennium Bug*'  
1998 - '*Electronic Flight Control Systems*' and design of a demonstration electronic flight control system model

## IV. SKILLS

**IT:** Experienced PC sizing and building; IBM compatible systems and Microsoft Windows based applications. Experienced user of Ansys Workbench 13 & 14, Catia V5, Corel Graphics Suite, Fluent, Gambit, LabVIEW, Latex, Maple, MATLAB & Simulink, Microsoft Office, Satellite Tool Kit, Solidworks.

**Programming Languages:** Java, Access VBA.

**Languages:** Native English, basic French, German and Japanese.

## V. ACTIVITIES AND INTERESTS

**Leisure flight simulator hardware design and build.** My passions for design and aerospace are met in my A320, Cessna 172S and G1000 simulator designs and showcased at *CockpitSOLID* online blog.

This hobby began when built a Boeing 737NG Fixed Base Simulator.

**Springboard and platform diving** Luton diving club. UK National Masters Diving Championships - 8th