

SPACE SYSTEMS SYMPOSIUM (D1)  
Lessons Learned in Space Systems (5)

Author: Mr. Thomas Sinn

University of Strathclyde/Advanced Space Concepts Laboratory, United Kingdom,  
thomas.sinn@strath.ac.uk

Mr. Malcolm McRobb

University of Glasgow, United Kingdom, mmcrobb@eng.gla.ac.uk

Mr. Roy Brown

Electronic &amp; Electrical Engineering / University of Strathclyde, United Kingdom, roy.brown@strath.ac.uk

Mr. Adam Wujek

Royal Inst. of Technology (KTH), Sweden, awujek@gmail.com

Mr. Christopher Lowe

Advanced Space Concept Laboratory, University of Strathclyde, United Kingdom,  
christopher.lowe@strath.ac.uk

Mr. Johannes Weppler

Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany, Johannes.Weppler@dlr.de

Mr. Thomas Parry

University of Strathclyde, United Kingdom, thomas.parry@strath.ac.uk

Mr. Daniel García Yárnoz

Advanced Space Concept Laboratory, University of Strathclyde, United Kingdom,  
daniel.garcia-yarnoz@strath.ac.uk

Mr. Frazer Brownlie

University of Strathclyde / Mechanical and Aerospace Engineering, United Kingdom,  
frazer.brownlie@strath.ac.uk

Mr. Iain Dolan

United Kingdom, iain.dolan@strath.ac.uk

Mr. Tiago de Franca Queiroz

University of Strathclyde / Computer Science, United Kingdom, contacto@tiago.eti.br

Mr. Fredrik Rogberg

KTH Mechanics, Royal Institute of Technology, Sweden, frogberg@kth.se

Mr. Nathan Donaldson

University of Strathclyde, United Kingdom, nathan.donaldson@strath.ac.uk

Mr. Ruairidh Clark

United Kingdom, ruairidh.clark@strath.ac.uk

Dr. Gunnar Tibert

Royal Institute of Technology (KTU), Sweden, tibert@kth.se

LESSONS LEARNED FROM THREE UNIVERSITY EXPERIMENTS ONBOARD THE  
REXUS/BEXUS SOUNDING ROCKETS AND STRATOSPHERIC BALLOONS**Abstract**

Since the start of my PhD in October 2010, I was involved in three experiments that were or will

be launched on sounding rockets and high altitude balloons with the REXUS/BEXUS program (Rocket-bourne / Balloon-bourne Experiments for University Students). The REXUS BEXUS program is organised and sponsored by the German Aerospace Center (DLR), the Swedish National Space Board (SNSB) and the European Space Agency (ESA). The first experiment, called Suaineadh was launched from Esrange (Kiruna, Sweden) onboard REXUS 12 in March 2012. Suaineadh had the purpose of deploying a web in space by using centrifugal forces. Unfortunately, the payload was lost during re-entry and a recovery mission to Kiruna in North Sweden was undertaken. StrathSat-R is the second experiment which will deploy two cube satellites with inflatable structures from the REXUS 13 sounding rocket after launch in May 2013. The last experiment is the iSEDE experiment which has the goal of deploying an inflatable structure with disaggregated electronics from the high altitude balloon BEXUS15/16 in September 2013. All these experiments are designed, built and flown in a timeframe of one and a half to two years, kicking off with experiment proposals every October (2010, 2011 and 2012). This paper will present the lessons learned in project management, outreach, experiment design, fabrication and manufacturing, software design and implementation, testing and validation as well as launch, flight and post-flight. Furthermore, the lessons learned during the recovery mission of Suaineadh will be discussed as well. All these experiments were designed, build and tested by a large group of university students of various disciplines and different nationalities. StrathSat-R and iSEDE were build completely in Strathclyde but the Suaineadh experiment was a joint effort between Glasgow and Stockholm which was especially tricky during integration while approaching the experiment delivery deadline. This paper should help students and professionals across various disciplines to build and organise these kinds of projects more efficiently without making the same, sometimes expensive, mistakes all over again.