

Range Systems analysis for commercial launch services

Code: 20/46

Company: UK Launch Services Ltd (UKLSL)

Location: Remote Working

Company Description:

UKLSL was founded in 2017 to provide expert support to organisations developing space launch services. We are a launch operations service provider offering management, regulatory support, logistics support, range services and operations planning services for commercial small satellite launch. Together with our delivery partners we have extensive knowledge of small satellites and their launch requirements, and our aim is to support commercial competitive launch operations from the UK. UKLSL also has wide ranging technical knowledge of launch vehicles, their technology and comprehensive knowledge of all potential UK launch sites (as well as the global market and competition). We are developing a wide ranging understanding of the technical and commercial challenges for the UK's first satellite launch site through work with a range of launch vehicle, launch site and mission analysis partners.

Project Description:

The first spaceport for small vertical launched rockets, to be sent on northerly trajectories into orbit, is being designed and built in Sutherland, Scotland. Systems design of range infrastructure for this and future spaceports, is needed to define and implement ground, flight and range functions for cost effective commercial launch services.

Various approaches are possible to receive telemetry from an in flight vehicle, track the vehicle as it flies towards the horizon, and in the event of a failure, send termination commands to stop the flight.

Architectures and system budgets based on range requirements will be defined to support launch vehicles operating from Sutherland spaceport. These will build on some existing antenna sizing and location estimates and comparisons with other sites. Different antenna sizes, wavebands, steering and support requirements have been identified. In particular the project seeks to understand size, ground footprint and any constraints on co-locating equipment in a single antenna 'park' to support range functions, and how equipment might be procured and deployed. The influence of regulatory and spectrum licensing requirements on technology selection should also be considered.

Other desirable outcomes of the project are:

- a) an assessment of how local topology and antenna radiation patterns may affect links

- b) A survey of potential suppliers of antennas suitable for tracking , receiving telemetry data from and sending termination commands to a launch vehicle, and
- c) a spreadsheet based tool to compare link budgets between different locations, RF requirements and trajectories.

Applicant Specification:

The intern will have the opportunity to develop their project / work package management and interpersonal skills as well as remote and on-line working skills during the project. They will be expected to apply basic RF link and systems engineering knowledge to a launch vehicle in flight application and to parametrically assess RF links and equipment using a spreadsheet or similar tool.

Minimum Requirements:

The applicant should have an undergraduate or postgraduate with a 1st or 2:1 degree in electrical electronic or systems engineering (or be in their final year with an expected 1st or 2:1)

They should be able to demonstrate experience in writing & manipulating link budgets and an understanding of antenna specifications.

Preferred Additional Requirements:

The ideal candidate would have prior experience with antenna design and potentially manufacture, knowledge of (ground based) antenna manufacturers and an understanding of launch vehicle conformal antenna design approaches.

A strong candidate would also:

- Be strongly motivated to contribute to the growth of the UK space industry,
- Show a willingness to quickly adapt to changing business requirements and new challenges on a day to day basis is fundamental to our team,
- Have an interest in launch vehicle design and architecture, and particularly their ground support systems,
- Be skilled in using spreadsheets and other analysis tools to quickly assess engineering problems
- Be hardworking & self-motivated. We are a startup so we like people who are willing to try to start solving problems after only a short briefing period and a limited set of information.

Further details:

8 weeks minimum fixed term contract to be agreed with successful candidate but nominally with a start date around 15 July 2020 to attend the on-line SPIN Induction day at the Satellite Applications Catapult.. Salary is £325 per week gross.

Closing Date for Applications: 5pm Friday 3 July 2020

Applications should be made through the online form attaching a CV, before the closing date. Please note that elements of the form left incomplete will be deemed to render the application ineligible. They will be checked for eligibility and forwarded to the employer.