

23rd IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Access to Space for Small Satellite Missions (5)

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VERTICAL LAUNCH OF SMALL SATELLITES FROM THE UK

Abstract

The small-satellite market is clearly a growing one. There are many views held by different bodies regarding how significant and large the growth is likely to be, with forecasts ranging from conservative estimates in the hundreds to growth numbers in the several thousands. Despite these variations in predictions, all are in agreement that the market is growing and will continue to grow for at least the next 5 to 10 years. The market is populated by customers who mostly require launch in to the polar and near-polar orbits.

Conscious of this growth the UK government has announced its intentions to select a UK spaceport for horizontal launch for sub-orbital flights. Six candidate sites are possible locations – all being close to the coast and having runways of the appropriate length. In addition to the horizontal launch capability, the UK would also like to become a site for vertical launch – this would help stimulate the market for small satellites by providing a low-cost and reliable service for satellites up to approximately 200kg in mass into useful orbits such as sun-synchronous orbits above 500km altitude. Whilst the horizontal launch can be undertaken from a variety of launch sites – 4 of the UK’s candidates are in Scotland, 1 in Wales and 1 in England – the vertical launch needs to take place from the North of Scotland for flight safety reasons and avoiding the penalty of large “dog leg” manoeuvres.

The paper discusses the options for a UK vertical launch facility – where it could be located, what sort of vehicles could be launched and what payloads could be launched upon those vehicles. With the aim of making the launch site costs as low as reasonably possible we also analyse the costs savings in launch operations made possible using modern technologies to provide a safe and reliable service. We also discuss the outline business cases for both the launch site and the launch vehicle provider.