Product Survey on Airborne Lidar Sensors

This is the second Product Survey on Airborne Lidar Sensors; the last appeared under the title â€˜Airborne Laser-scannersâ€™ in our May 2004 issue. Seven companies were willing to co-operate by filling in the questionnaire for the present survey.

â€˜Airborne Laser-scannersâ€™ is a term used in Europe; other parts of the world have generally adopted the term â€˜Airborne Lidarâ€™. Two companies represented in our previous survey, Mosaic Mapping Systems and Terrapoint are beyond the scope of the present survey, while we welcome two newcomers. The first is Ingenieur-Gesellschaft fÃ¼r Interfaces (IGI) based in Kreuztal, Germany, which produces and sells the airborne Lidar Terrain Mapping system (LiteMapper) 2400. IGI is an engineering company founded in 1978 by Albrecht Grimm and specialising in the design and development of guidance positioning, attitude determination and sensor-management systems for airborne survey. The second newcomer is Fugro, a company that operates the FLI-MAP 400 system for Lidar survey. This company is positioned somewhat eccentrically in relation to other firms in that it does not put the FLI-MAP system itself on the for-sale shelf but performs only surveys. However, its system has been developed in-house and differs significantly from what other sensor operators are using in performing surveys based on Lidar systems offered by one or more manufacturers. We felt the uniqueness of the Fugro system qualified it for inclusion in this product survey. Another company standing apart from its counterparts in a similar respect is the German Toposys, which enjoys a unique position worldwide in that it combines the manufacture of Lidar systems with self-executed Lidar surveys. The company considers this dual role an advantage as it provides a broad base of expertise.

Although Optech, based in Toronto, Canada is a world leader in the development, manufacture and sale of Lidar systems, the company prefers here to present only its newest system, the Airborne Laser Terrain Mappers ALTM Gemini, able to generate 167,000 pulses per second. Precision and resolution statistics presented in these surveys are always a little tricky because the claims depend on system components taken into account. For example, does elevation precision include GPS errors or is it quoted without? Statistics on minimum detectable size of objects should also be considered with care because this factor depends on flying height and target reflectivity. At a platform altitude of 200m power-lines just 8mm in diameter may be mapped; at flying height 1000m they need to be 3cm. The maximum possible number of points detected per square metre also depends on pulse rate and rotation/nutating speed of mirror on flying height, reflectivity and platform speed. The fields of application for Lidar are very diverse and include generation of digital elevation models, 3D-city modelling, forestry management, coastline protection, disaster management, erosion studies, archaeology, monitoring of corridors such as power-lines, pipelines, railways and roads.

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