

W5.3

Revolution in new imagery technology to improve Ordnance Survey mapping

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Improving services to customers

In a response to improve the up-to-dateness of our rural mapping, improve its quality and to support the introduction of maintenance for the Digital National Framework, Ordnance Survey has embarked on a major investment programme to modernise its photogrammetric survey capability.

The search started ten years ago, but specialist technologies (image processing workstations) and our own business priorities led towards investment in the intervening time into mono digital image solutions. This latter flowline proved very satisfactory for several years.

Photogrammetry – a very effective tool

Photogrammetric update by Ordnance Survey has accounted for approximately 40% of the most detailed database change in recent years – yet employs only 12% of the survey workforce who are supported by several contractors. It is therefore a very effective and efficient method of update. This is primarily based on the large economies of scale available in national programmes, ie – flying large extents of rural terrain and recording sufficient change to make the whole operation worthwhile.

The aim is to complete rural areas in a five-year cycle and mountain and moorland over ten years. Conversely, where our customer requirements are to record major change within 6 months of completion, as in urban areas, the opportunities here can be less frequent.

The current position

Over the last 2 years we have refocused our attention on developing a versatile stereo capture capability. Unlike a decade ago, this is now a maturing technology based largely on off-the shelf hardware. This has led to the migration of traditional stereo photogrammetric capture systems towards digital imagery, with the introduction of PC based Digital Photogrammetric Workstations (DPW).

As a result of open tender, Ordnance Survey chose a Laser-Scan LAMPS2 edit/capture management system closely integrated with SOCET SET photogrammetric software provided by LH Systems. Thirty DPWs have now been purchased as part of a framework agreement and these workstations now provide the main photogrammetric production resource.

The system

Although an interface existed between Laser-Scan's LAMPS2 and SOCET SET at the time of procurement, further development has been necessary to fully meet specific revision requirements. These requirements have been implemented to provide robust maintenance of structured data and safeguard the integrity of data, which will form a core topographic component of the new Digital National Framework (DNF). This process has necessitated that the Ordnance Survey and Laser-Scan organisations work closely to ensure that Ordnance Survey has the editing functionality available to ensure efficient capture and edit of three-dimensional data.

In contrast, the LH-Systems photogrammetric software is a tried and tested off the shelf product which fully meets our needs. Enhancements have been limited to that necessary to ensure that the DPW integrates fully with existing Aero Triangulation equipment.



The integrated stereo image and database update tools, now in production.

In order to benefit from this technology, Ordnance Survey has invested heavily in training its 50 photogrammetric operators, as well as its specialist support and development staff. The training has been done internally and has included training in SOCET SET, LAMPS2, and the relevant data specification to support DNF data update.



A typical example of the data to be updated by photogrammetry

The benefits

The purchase of DPW technology has given the Ordnance Survey the tool to ensure that data quality, accuracy and consistency meets customer needs and is 'fit for purpose'. It provides the functionality for maintenance of its most detailed mapping (ie original survey scales of 1:1,250, 1:2,500 and 1:10,000) within one system, and encompasses the flexibility to allow well-trained staff to be utilised on tasks of differing type and complexity.

As well as revision, it is the intention to use this technology for positional accuracy improvement to ensure consistency across all rural areas, as well as up grade the standard of mapping in many rural towns to an absolute accuracy of ± 0.4 m.

See the Ordnance Survey web site for details: - www.ordnancesurvey.co.uk.

Further enhancements to allow this technology to be used within our height maintenance flowlines, and exploit data captured as part of the proposed new DNF colour imagery layer, are also in hand.



Ordnance Survey is now flying colour photography to support the maintained DNF colour image layer, much of this imagery will also be used in production for update purposes.

In Conclusion

The introduction of DPW's in production has ensured that Ordnance Survey has the technology to exploit future opportunities in digital imagery and automation.

- It is the intention to realise the investment not only through the increased production on traditional capture activities, but through the creation and maintenance of new products and services to support future releases of the Digital National Framework (for example Imagery, height data etc).
- This will require the continued development and implementation of system enhancements and operational practices, as well as research and development into innovative new ways of working.

- It is hoped that through further development of successful partner relationships the perceived benefits of adopting new technology will be realised.

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