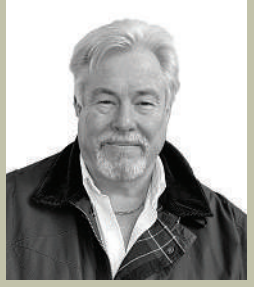

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Broadening Horizons

Andy Beckerson looks back in time to trace similarities between one game-changing development and a contemporary counterpart ... one poised to make GNSS data collection a mass market reality

Let me take you back in time to 2010.....INTERGEO was in Cologne and FARO introduced the Focus3D laser scanner. Game-changer or disruptive technology, the newcomer transformed laser scanning and I can still remember the impact of its launch and the crowds on the FARO stand.

Not only did the Focus change the laser scanning market with its compact form factor and aggressive pricing, but suddenly laser scanning, as a technique, became much more acceptable and within the financial reach of many more companies. Both the price and form factor contributed to the disruptive nature of the FARO Focus.

On to the present

But let's move on to the present and consider another disruptive technology ... one that addresses the data collection needs, not only of the professional user, but also of the occasional user. In short, it's a step that will bring GNSS data collection to the mass market.

This new technology simplifies the collection of spatial data and makes it much more affordable by combining the readily available smartphone with the increased availability of digital data services.

Hailed as a "revolution in 3D", the game-changing FARO Focus3D made its debut at INTERGEO 2010 as the smallest and lightest 3D laser scanner ever built. Photo: Laserscanning Europe GmbH

However, the ease of access to these services has prompted the question "How do I get better positional accuracy?"

At the Trimble Dimensions conference in November, Trimble introduced Trimble Catalyst, a GNSS (GPS and Galileo) receiver built out of software. This so called 'soft' GNSS receiver can be downloaded to an Android mobile phone and used in conjunction with a new, small, digital antenna that converts raw GNSS signals from analogue to digital USB data. Combine these elements with Trimble's real-time VRS data correction service and Catalyst can deliver 2cm positional accuracy bringing centimetres, everywhere to everyone.

So what's the deal?

Let's consider what users would typically expect of such a service? First, they would expect delivery to be simple; second, it must be easy to use; third, it must be convenient and last, but not least, it must be affordable. With Catalyst, all this is achievable. The user simply downloads the free App onto their existing smartphone, purchases the antenna, and subscribes to the required level of service. This combination provides the best price/ performance ratio, with the smartphone processing the data and displaying the results.

There are several enablers:

1. The smartphone platform which has evolved as a universal tool and is growing in use to gather mobile spatial information for both consumers and professionals. Helpfully, there are many accessories (cases, protectors and external batteries) that enable smartphones to be used successfully in harsher environments i.e., outdoors!
2. The increased availability of a broad range of digital data services.
3. Connectivity enabled by the growth in mobile coverage.
4. Use of the cloud.
5. The user interface. Catalyst is designed for embedding into Apps on mobile platforms, smartphones or tablets and in the UK it is currently available for K-Mobile, utilising OS MasterMap, and Esri Collector for ArcGIS. A Software Development Kit (SDK) is available to build high performance positioning solutions into users' current applications.

The DA1 digital antenna developed for Trimble's Catalyst (pictured) offers incredibly reliable reception of GNSS satellite signals to deliver precise positional co-ordinates on tablet or smartphone screen. Photo: Trimble

How does this compare with what is available today? Catalyst successfully closes the gap in positioning performance by significantly enhancing the smartphone positioning accuracy delivering sub-metre and centimetre accuracies across a range of environments. It is less accurate in harsh environments due to working with only two constellations and not utilising the 'wide band' performance of current GIS devices. Even so, it does meet the need for a simple, easy to use, convenient and affordable solution for delivering centimetres, everywhere for everyone.

Put to the test

So how well does it perform? Tests have been conducted in three typical GNSS environments: Open (includes some light foliage), Mixed (has some sky obstructions), and Harsh (heavy canopy and close buildings). The tests considered two subscription levels: sub-metre (with the correction delivered by satellite to the antenna, no mobile phone connection required), and centimetre (with the correction delivered by the mobile phone service).

In the Harsh GNSS environments both services delivered a typical accuracy of two metres, hardly surprising! However, in both the Open and Mixed environments, the sub-metre service accuracy was achieved while the centimetre service delivered two centimetres.

Trimble Catalyst in the field: a GNSS receiver built out of software. Photo: Trimble