

# NavCom products perform equally well when compared to top-tier receivers, but at a much more competitive price point



Says Steve Ault, Product Manager, NavCom Technology, Inc., in an interview with Coordinates

## What are the features of NavCom's StarFire™ Network?

In the broadest sense, we have two types of users of StarFire™ signals: those who take full advantage of all the NavCom developed navigation feature sets, and those who develop their own navigation feature sets and take advantage of the highly accurate, global availability, and inherently redundant reference and delivery system. The latter group of customers tend to be integrators or government contractors, though that is not entirely the case as we have commercial accounts as well. For those in the first group, NavCom's continuous development in this space has brought improvements in accuracy, convergence time, augmentation to RTK with RTK-Extend (RTK-X) to aid in temporary loss of RTK signaling, Quick Start which virtually eliminates convergence time, and Rapid Recovery which significantly improves performance after navigation signal loss. The fact that we own and operate all of the reference sites, hub equipment, and satellite modulators, allows us to easily modernize the system with thoughtful and purposeful consideration.

We can look at our down-stream technology plans and build the network to accommodate those in time of need without

reliance on other companies to complete and deploy current or newer technologies. The infrastructure and supporting software is complex, state-of-the-art, and continues to deliver new capabilities.

## How does the LAND-PAK system offer the best of both the worlds, i.e., RTK and StarFire™ capabilities?

LAND-PAK is marketed as an RTK survey turn-key solution. All surveyors know that there are inherent challenges maintaining an RTK fix, particularly over long baselines. When StarFire™ signals are applied to the survey environment, RTK service gaps can be extended for a workable time to get those last few data points before needing to relocate the base receiver. This improves productivity by extending the fringe areas of the RTK communications link which might be radio signal obstructed due to a small change in the terrain, the introduction of tall buildings or man-made structures to the survey environment. There are applications, such as boundary surveys, which will accept the 5cm level of accuracy obtainable from a StarFire™ receiver. In these application spaces, LAND-PAK is a great solution as it eliminates the added

infrastructure needs of a traditional RTK base and rover setup; the communication is automatic, passive, and only requires the rover GNSS receiver and data collector.

## What makes LAND-PAK a complete turn-key land survey solution?

Our tightly coupled relationships with the makers of FieldGenius and SurvCE data collection software ensure end-users can take full advantage of the high-performing SF-3040 GNSS receiver. The developers of these programs perform their own acceptance testing before handing the software off to NavCom, where we perform our own extended set of testing. It doesn't stop there... adding desktop CAD software to manage their collected data provides end-users a great package to conduct land surveys.

## What sets LAND-PAK and StarFire™ apart from its competitors in high accuracy and high precision surveying applications?

Let's start with StarFire™. StarFire™ is the longest operating commercial GSBAS



available with demonstrated exceptional reliability and performance. This level of performance and continuous improvement is demanded by our adjacent markets and it has its appropriate place in the survey market as well. Where adjacent markets pay a premium for this added capability, it is included in LAND-PAK with no recurring fees. This has proven to be a key market differentiator in lesser developed countries which will accept near-RTK level performance for their survey needs. Customers in developed countries take advantage of the RTK extended features which rely on StarFire as the underlying technology that bridges the gap between continuing work in fringe areas of radio coverage and not being able to work until the base station is moved. Developed countries also have the advantage of using industry standard correctional sources delivered over cell modem (such as NTrip), thereby significantly reducing their infrastructure and operational costs. LAND-PAK is available in a variety of configurations to best meet the end user's needs and budget. NavCom products perform equally well with top-tier competitive receivers as a result of the performance demands in our adjacent markets, but at a much more competitive price point as compared to those top-tier manufacturers. ▴

**“Despite the tough, remote conditions we work in, the NavCom receivers have found to be rugged, reliable and dependable”**

**A**tlas Geophysics is a specialist company that carries out high precision, high accuracy gravity, magnetic and seismic surveys in Australia and abroad. Our core work mainly comes from gravity and geodetic survey. Gravity surveys are used with great success to determine subsurface density contrasts and are used widely for mineral and petroleum exploration where direct ore body targeting is required. They are also useful for broader spaced regional geological mapping and often complement other techniques such as magnetic and electromagnetic surveys. On a micro-scale, gravity surveys can also detect small caves, karst structures and even old grave sites.

The gravity field is very sensitive to changes in elevation and in fact changes in elevation can swamp the density effect of rocks and ore-bodies below the observation point, so it is imperative that the position and elevation of the observation point be known accurately so that a necessary correction can be made. Elevations to better than 5cm are generally required and to achieve this, Atlas Geophysics deploys receivers from the NavCom family such as the SF-3040 and SF-3050.

For detailed surveys that need to be walked on foot, we utilize the SF 3040 LAND-PAK receiver as this a great, lightweight all on the pole solution where reliable RTK can be achieved over distances exceeding 30km. Where our high powered UHF link is degraded due to obstacles such as trees, terrain and buildings, we often utilize the StarFire™ differential signal to “fill in the holes”. This means we can continue

working without having to move our base station or setup radio repeaters, resulting in very little downtime. The great thing about StarFire™ is that we still get high accuracy!

Where stations are spaced too far apart to walk, we generally employ helicopters and custom UTV survey vehicles to carry out acquisition. Radio range is also a factor on these projects, so typically Post Processed Kinematic data are recorded using SF 3050 receivers. We have tried and tested receivers from many stables and have found the SF 3050's performance under helicopter blades to be unmatched. Even at long baselines, we consistently see little to no loss of lock under the blades and can easily return accuracies of 2-3cm using post processing.

Despite the tough, remote conditions we work in, the NavCom receivers have found to be rugged, reliable and dependable. Being thousands of kilometres away from anywhere means we need things to work well, without malfunction and we have found NavCom to deliver.

The equipment is a critical factor but also the expert support we receive from the factory trained reseller allows us to go anywhere in the world with confidence. There are other good systems in the market, but the value and unique features of the NavCom offering is extremely compelling for any survey type business. ▴

*- Leon Mathews, Director / Geophysicist,  
Atlas Geophysics, Australia*



# StarFire™ provides great savings for remote regional surveys



*Says Peter Terrett, Owner RapidMap Global, in an interview with Coordinates*

## How does NavCom offer solutions for unique customer applications like mining?

The NavCom GNSS receivers provide unique advantages over normal RTK GNSS equipment. The integration of RTK with NavCom's StarFire™ service enables the user to continue to work at RTK accuracies for up to 15 minutes where RTK correction signals can be easily lost. RTK-Extend means you can concentrate on your project and not on your equipment.

## By removing dependency on base stations, how does StarFire™ benefit its customers, especially in the field of very remote area gravity and geodetic surveys?

In Australia, 5 cm does not constitute good geodetic accuracy so StarFire™ does not generally apply for geodetic surveys. In regards to gravity surveys it provides great savings for remote regional surveys. In remote areas it can take a couple of hours

to travel a couple of kilometers. So setting up a base station, then travelling from and back to it can be time consuming. This is made worse when there may be issues with wildlife, radio propagation, batteries or other factors affecting the performance of the base station. With StarFire™ fully converged, you can simply travel to the points of interest and take your readings. Of interest, we have found that the NavCom will work under a helicopter rotor whereas some other manufacturers simply will not. ▽

## "Users have been able to readily and easily complete useful surveys using StarFire"



Sibelco purchased a LAND-PAK package from Peter Terrett at 4Dglobal (RapidMap Group) in July 2012. This package was split-up for two very different uses. One SF-3040 head-unit was mounted on a dredge at a sand-mining site in Victoria and the other SF3040 head unit plus pole and data-collector have been used as a travelling DGPS (StarFire™ corrected) rover for informal survey, mapping and set-out at sites around the country. Both units have performed reliably and demonstrated sub-decimetre accuracy and repeatability.

The DGPS (StarFire™) rover has proven to be relatively easy to

use. Users ranging from surveyors to non-technical personnel have been able to readily complete useful surveys. Tasks completed with this unit include topographic surveys, geological mapping, grade control set-out/pick-up, exploration/resource drilling set-out, blast pattern set-out and pick-up and set-out/validation of earthworks and pit designs.

The dredge-mounted unit has been in service almost continually for three years. It is mounted to a mast and powered from a UPS based on a deep-cycle marine battery. This allows the unit to continuously stay in high-

precision StarFire™ mode. NMEA data is sent over a custom-built COM cable to real-time navigation and mapping software which assists the operators in mining to plan. The dredge software also logs cutter position and averaged water-level (tide) derived from the NavCom GPS. This logged data (approximately 13.5 million points to date) is used to monitor dredge position, record changing pond levels and model the as-mined underwater surface. ▽

*- Geoff Tonkin, Sibelco, Australia*

