



## NovAtel

This Calgary-based company is protecting soldier's lives with its anti-jamming technology

BY NORMAN LEACH

**W**hen you think of Calgary you might think of the Calgary Stampede in July and the oil and gas business the rest of the year. Mention Calgary and few think the city being a centre of excellence in the defence sector.

Yet, tucked around the northwest edge of the Calgary International Airport is a cluster of world class names in the defence industry – Raytheon, Harris, Bell and General Dynamics. Now, add to that list NovAtel.

Recently ranked number 28 in CDR's survey of Canada's top defence companies, the Calgary based, Swedish-owned manufacturer of Precision Global Navigation Satellite Systems is poised to move up the ranks with its recent announcement on the launch of its GPS Anti-Jam Technology.

GPS has completely changed the face of warfare. No longer are armies, or even individuals soldiers, going into battle not knowing exactly where they are at all times. Gone are the days of depending solely on maps and

compasses to ensure mission success. However, as good as GPS is, opposing forces are just as quickly developing ways to jam the signals trying to blind Canada and her allies in the field.

On June 1st NovAtel executive announced that, together with their partner QinetiQ Ltd, it now had an effective anti-jamming solution available as an off the shelf solution. Known as GPS Anti-Jamming Technology (GAJT – pronounced Gadget) is "the world's first single-enclosure GPS anti-jam system small enough for light armoured and other land-based military vehicles. The GAJT combines NovAtel's and QinetiQ's outstanding technologies in a stand-alone, rugged enclosure that mounts to the exterior of vehicles."

### PROTECTING TROOPS ON THE GROUND

According to Michael Ritter, President and CEO of NovAtel, "The GAJT is the first GPS anti-jam system that is small enough, and at a price point that makes sense to use on land-

based military vehicles such as LAVs (light armoured vehicles)." Mr. Ritter added, "We are extremely pleased to have developed a game-changing product that will protect the positioning and blue force tracking of troops on the ground, and potentially save the lives of personnel who encounter jammers while in theatre."

The company describes the GAJT as just 290 mm in diameter but it delivers the same anti-jam performance as much larger systems. Because the GAJT is a commercial off-the-shelf (COTS) product, it is available on short order lead times allowing for quick deployment – at significantly reduced costs.

Neil Gerein, Product Manager for the GAJT program at NovAtel, recently told CDR that, "The GAJT easily integrates into new vehicle platforms or can be retrofitted with GPS receivers and vehicle navigation systems on existing and legacy military fleets. As an externally mounted single-unit enclosure, no additional electronics are necessary inside the



Gerein is product manager for the GAJT program at NovAtel

vehicle; only power and a single RF cable are required to connect to legacy GPS receivers. The simplicity of its design results in faster installation, minimal vehicle downtime and training, and makes the antenna easier to integrate into new platforms, or retrofit onto existing platforms or fleets."

## NO ITAR ISSUES

An additional benefit is that the GAJT is manufactured in Canada using Canadian and UK technology so the system does not need ITAR approval when selling to customers in foreign countries.

Cathy Kane, Director of QinetiQ's Technology Insertion business said, "We are delighted to be partnering with NovAtel to bring this much-needed and exciting force protection product to market. I have been particularly impressed at the way the people from NovAtel and QinetiQ have brought their different skills together to form an effective team."

NovAtel's Gerein explained that, "the GAJT's proprietary technology works like noise-cancelling headphones. We use our new technology to "overpower" the signals being sent by jammers to block GPS satellite signals."

According to company information the GAJT uses, "... antenna elements that create up to six independent nulls in the direction of the jammers. With the jammer nullified, the GPS receiver is clear to acquire and track the GPS signals needed to ensure accurate battlefield position."

The GAJT has seven separate antenna elements built into the housing that provide six antenna "nulls"- areas that block the incoming jamming signal. This allows the system to provide the maximum protection for the troops in minimal space.

Designed to be externally mounted on existing vehicles the GAJT requires no modifications to the vehicle's internal electronics and a single RF cable allows for complete integration with GPS receivers and vehicle navigation systems.

"A simple 1-watt jammer can overpower GPS signals within a large area. The GAJT significantly decreasing the reach of the jammers, ensuring that positioning capabilities are retained during combat, training or other vehicle based missions," explained Gerein.

The company's website describes the system as "an active antenna based on a 7-element controlled reception pattern antenna and null-forming algorithm." During operation the antenna reduces the gain in the direction of malicious and accidental jammers.

Technical specifications provided by NovAtel explain that, "by incorporating NovAtel's



GAJT easily integrates into new vehicle platforms

patented 7-element Pinwheel™ antenna, seven independent copies of the GPS L1 and L2 frequencies are acquired from seven different locations within the GAJT's radome. These are then down-converted to intermediate frequency for high-speed digital sampling and processing by QinetiQ's proprietary null-forming algorithm. This optimizes the power and phasing of the seven independent signals to create a single, high quality output signal. The output is then up-converted to the original GPS frequencies. The clean output signal is delivered through a standard TNC connection, via coaxial cable, to the antenna input port on new or legacy GPS receivers." Gerein explained, "The GAJT has been tested,

successfully, by both the Canadian and British military. We know this technology will save lives both in the field and during training."

NovAtel will start accepting orders for the GAJT in the third quarter of 2011.

## LAUNCHED AT CANSEC

Established in 1992 NovAtel quickly became a leader in the new field of Global Navigation Satellite System (GNSS) technology. Employing over 350, the company provides receivers, antennas and subsystems that are used in a wide range of military applications including unmanned vehicles, vehicle tracking and navigation. NovAtel GPS systems and components have been used by NASA, the Canadian and US military and around the world.

On the civilian side NovAtel (owned by Sweden's Hexagon Group) provides solutions to the surveying, mapping, precision agriculture machine guidance, port automation, mining and marine industries. In addition to Canada the company has systems operating in the USA, Japan, Europe, China and India. Only 5% of the company's sales are in Canada.

A joint media release handed out to media at the launch of the GAJT at the CANSEC Trade show on June 1st in Ottawa described NovAtel's partner QinetiQ as, "a leading international provider of technology-based services and solutions to the defense, security and related markets. QinetiQ develops and delivers services and solutions for government organizations, predominantly in the UK and U.S., including defense departments, intelligence services and security agencies. In addition, QinetiQ provides technology insertion and consultancy services to commercial and industrial customers around the world."

Neil Gerein concludes that, "We are all very proud to be involved in a project that will make a real difference on the battlefield. Anything we can do at NovAtel and QinetiQ to make our soldiers safer is already a success. The goal is to bring everyone home safely and the GAJT will be a big part of reaching that target." ■

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