

THE American Surveyor

A FOOT IN THE PAST... AN EYE TO THE FUTURE

September 2006

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the BIGBUZZ

in a busy industry

“...surveyors can work with just a rover in the field and achieve centimeter level accuracy.”

The big buzz at Orlando’s recent ACSM show was all about the explosion of RTK networks across the country. The increasing coverage means that surveyors can work with just a rover in the field and achieve centimeter level accuracy; the hassles of setting up a base station and worrying about theft are a thing of the past for more and more companies. Surveyors in many states have been taking advantage of DOT networks for years, but the real growth recently has been the private, for-profit networks being set up primarily in

metropolitan areas. A good example is ARTNet, the network being developed in the Atlanta area by Allen Precision Equipment. Allen Precision Equipment is taking total responsibility for their base stations, rather than relying on the people who own the building where the base station is located, and will provide 24/7 monitoring and support. To add even more credibility, a GPS industry expert, Wendy Watson, has been hired to oversee all ARTNet operations. As we will see, her career reveals just how interwoven this relatively new industry is, and how talented people often end up working with or for most of the

>> By Marc Cheves, LS

major manufacturers. Information for this report was provided by Watson in a recent interview conducted at Allen Precision Equipment in Atlanta.

Watson graduated from the University of New Brunswick in 1985 with a degree in Surveying Engineering, the well-known program with well-known professors like Richard Langley. Her first job out of school was at Calgary's Nortech Surveys, working under Gerard LaChapelle, who went on to head another highly regarded survey program at the University of Calgary. Responding to demand from Alberta's oil and gas industry, Nortech used a grant from the province of Alberta to develop the first DGPS receiver in a box. This led to the creation of Norstar Instruments, which was spun off by Nortech and then acquired by NovAtel Communications. NovAtel, formerly a Canadian giant in cell communications, eventually redefined itself as a GPS firm and sold off its other interests.

Meanwhile, at a 1989 Australian conference, Watson met Javad Ashjaee, the brilliant technologist who had just founded Ashtech the year before. Watson became the 17th employee of the new firm. She recalls it as an exciting time; Ashtech was then the only company offering a 12-channel receiver, and a small group of highly talented people, including industry



Wendy Watson, Vice President, Network Solutions, ARTNet, LLC.

luminaries like Ben Remondi, Kendall Ferguson, Rick Sauve, Ellis Veatch and Mike Evers, was rapidly expanding the boundaries of GPS technology. Watson started out writing software and pitching in with everyone else on tech support, testing, and manufacturing. Over time, she gravitated toward tech support, customer service and training.

To support an OEM agreement with Topcon, Watson began training Topcon staff, which led to a position at Topcon, where Charles Rihner handled sales of GPS and Watson managed the technical side. Topcon entered into an OEM agreement with Allen Osborne, and Watson was instrumental in the birth of the Rascal.

After three years, Watson returned to NovAtel in an effort to move the company from primarily OEM arrangements into outright sales of application

equipment. While there, though, she also worked on significant OEM equipment deals for Zeiss and Nikon. After five years, Watson moved to POINT, Inc., a joint venture of Sokkia and NovAtel, and remained another five years, for a total of ten years under the NovAtel umbrella.

POINT's first president was Bob Morris, formerly of Sokkia. Watson's role was to oversee product development and management; she sees all this as facilitating the interface between end users in the field and engineers in the laboratory. It remains a high point of her career, as she loved bringing together the technical and marketing sides of the business, along with the creation of business plans and new product development while always keeping an eye on profitability. Morris eventually became the president at Leica



RTK training on the network for Allen Precision Equipment employees. L-R: Terry Nutt, Outside Sales–GA; Chip Teague, Outside Sales–SC; Jeremy Adams, Outside Sales–FL; Johnson Her, Technical Support.

Geospatial in Atlanta, and invited Watson to join him there as the Vice President of Product Management & Marketing. After 18 years in the GPS industry, it was time for a change. She relocated to Atlanta, along with her computer genius Scottish-born husband and their two children.

Hexagon then acquired Leica, and Watson felt that the focus was shifting in the Geospatial group from being customer-driven through Product Management to being more engineering driven. Fortunately, she had strong connections in Atlanta going back to her time at Topcon, when she met Warner and Jimmie Allen of Allen Precision Equipment; she had even come to think of them as family. In February of 2006, as the reality of the Hexagon takeover began to set in, Jimmie Allen called Watson to discuss the ARTNet venture, offering her a major role. She jumped at the chance, seeing it as an opportunity to, in effect, run a small business while also being part of the Allen Precision Equipment family.

So Watson has had a dizzying career, working with many of the founding innovators of the GPS industry. Clearly, she is qualified, and more, to develop a



private GPS network. But what about ARTNet; how does she envision the network?

Major decisions are still being made, but initial plans call for coverage of the greater Atlanta area (a radius of 100 miles) with eventual expansion to the entire state of Georgia and the Florida Panhandle. Five base stations have already been installed and are being tested, and two more installations are underway in southeast Atlanta. At the time of the interview, Allen Precision Equipment was also preparing for four installations in the Florida Panhandle.

Coverage planned for the Atlanta area at the time of system launch at the end of September.

The long range plan is to extend the network expertise to other customers, such as counties or cities that want to set up their own reference networks.

One of the major advantages to the design of ARTNet is the connectivity being established between reference sites via a Virtual Private Network (VPN) on DSL lines. “We decided to put in our own network so we wouldn’t be dependent on local Internet Service Providers

ARTNet

(ISP)," says Watson. "With our own VPN we can ensure the availability of the network, versus the up and down availability of other ISPs. The VPN is brought into each site so that we can promise the occupants that we will not be interfering with or using their IT infrastructure, or dealing with their firewall issues. It costs more to do it this way, but it's a better long term solution in terms of network stability, availability and quality control."

Rovers will communicate with a central server at a local server farm. The base stations are Topcon PGA-1 ground plane antennas with Odyssey RS receivers, and will be upgraded with the new Topcon G3 receivers as they become available. Watson proudly states that Topcon was the first manufacturer to incorporate the tracking of GLONASS satellites and has had more than 6 years doing so, and adds that Topcon will now be the first manufacturer to offer a next generation GPS/GLONASS/Galileo receiver in a reference station, ensuring that all signals available will be tracked well into the future.

ARTNet will provide three services as part of the network: DGPS for GIS work, RTK and Virtual Reference Station (VRS). The difference between RTK and VRS is that RTK broadcast corrections do not include adjustment for ionospheric errors and other atmospheric factors. While both provide survey grade accuracy, with RTK accuracy degrades as a factor of distance from the base station, but with VRS, this is not true. A tiered pricing system for all three services has been established, with additional fee adjustments based on the number of rovers signed up.

Allen Precision Equipment will be 100% responsible for network operations, so users will always know who to call. A 30-day data archive will be established, building a backup for post-processing of observations.

At the Orlando show, *TAS* met with Dr. Robert Snow, Thales Director of Sales and Marketing for North, Central and South America, and he made the point that Thales will not concentrate on setting up networks, but will instead concentrate on making receivers that work with *all* the networks. Watson concurred with this point, and extended it by noting that even though Allen Precision Equipment is in the business of selling equipment, and providing service and training for that equipment, the firm is creating a network that will work with all modern equipment. She says that the company philosophy is to first work with whatever GPS equipment the surveyor already owns regardless of brand but to also provide options to the customer for upgrades and/or sell them new receivers through Allen Precision Equipment.

The company is doing something right; when *TAS* visited, dozens of surveyors and salesmen were being trained on GPS equipment. It was a veritable beehive of activity, another component of the big buzz around what looks to be the next big leap in the GPS industry: ubiquitous RTK and VRS networks like ARTNet, run by experts who see the potential for profit, and for a better way to survey. *A*

Marc Cheves is Editor of the magazine.

ARTNET

- Initially set up for Georgia Reference Network starting with greater Atlanta area
- Plans are for DGPS/RTK network initially but designed for VRS
- Privately funded and maintained based on revenue

BENEFITS TO THE OWNER OF THE SITE

- Discounted network fees for GPS users
- Non-GPS users will be extended incentives for GPS equipment, surveying supplies or repair services from Allen Precision.
- There is no cost to the building/occupant to host the reference station; Allen Precision incurs all the costs as the owner of ARTNet.

ARTNET RESPONSIBILITY

- Allen Precision responsible for installation and maintenance of the reference stations
- Allen Precision responsible for Virtual Private Network (VPN) connection of the reference station without interference to occupant's IT infrastructure
- Allen Precision responsible for all submission of paperwork to NGS for Cooperative CORS sites

BENEFITS OF ARTNET

- All capable GPS products can use ARTNet.
- Latest technology to track all available signals (GPS including L2C, L5; GLONASS; Galileo)
- Virtual Private Network