

# North Country Surveyors Warm-up to RTK



Along the border between extreme northern Maine and western New Brunswick, Canada, two surveyors, one Canadian and one American, have found a way to survey in the region's challenging conditions: using RTK. Faced with fewer control monuments, many lying beneath a cover of snow much of the year, limited cell-phone coverage; rugged terrain and UHF transmission limitations - the two men were led to the Ashtech Professional ProMark 500 RTK solution.

Michael Cyr, owner of Northern Maine Surveyors in Madawaska, ME, USA, works across the St. John River border from Gaetan Soucy, proprietor of Arpentages Gaetan Soucy. Both are in essentially the same business: property boundary, topographic and construction surveys for residential and commercial development.

Michael Cyr's career in surveying began more than forty years ago helping his father do boundary surveys in the northern Maine woods with a K&E Paragon transit and steel tape. In 2009, Cyr, whose business is based about 50 miles from the nearest CORS station, saw the need and usefulness of an RTK GPS system. He had the opportunity to demo an Ashtech Professional ProMark 500 dual-frequency GPS / GLONASS GNSS system, with an embedded U-Link UHF radio, from The Sidwell Company.

"There is a learning curve for any new hardware/software system," Cyr says, "but operating this new system was easy. However, he adds, "it does require an understanding of various coordinate systems, scale factors, grid, true and magnetic reference systems as well as the ability to localise." Just as any surveyor would not stake out a corner without a good zero reference and distance check on his backsite, I quickly learned that localisation is the most critical step in performing a stakeout or adding information to an existing system."

The Ashtech FAST Survey field software that's loaded on the ProMark 500 makes file manipulation with localisation easy and certain. With the base and rover at two existing control points, FAST survey can rotate, translate or scale to the surveyor's ground system.

"With 16 satellites, radio link and Bluetooth icons glowing and that sweet word 'FIXED' on display, simply walk the rod to zero," he says "Always confirm that the RMS and radio latency are good. Want a quick check? Press the 'RESET RTK' on screen and within 20 seconds or so, see the display go to 'FLOAT' then 'FIXED' to verify your position again. "

Operating close to the border has its limitations for radio use. "The MobileMapper CX field terminal with FAST Survey is friendly and easy to use, Cyr says. "Going into unknown and difficult terrain, I just pack the rover antenna (no wires!) into my backpack, select any point number loaded in FAST Survey and navigate with the MobileMapper to within a few metres of the next corner. Setup the rover, establish RTK communication and set your corner when 'FIXED.'"

Cyr describes a familiar situation: "Your client's conversation with the neighbor involves a four-acre addition to the rear of what you have just staked out. FAST Survey can easily extend, intersect, coordinate and calculate area on-site, then stake out in RTK. The rover will easily guide you to set points along a line as you navigate to your next corner as well. The ability of the ProMark 500 Base to log raw data in a static session while I'm out roving in RTK is a simple one-button operation."

OPUS <http://www.ngs.noaa.gov/OPUS/> post-processes and provides Cyr with a high accuracy National Spatial Reference System coordinate to use as a reference. This is a fully automated free system and requires minimal user input. The ProMark 500 rover can also log raw data and Cyr has, with a 15-minute observation, obtained centimetre post-processed accuracy in the most extreme conditions of the North Maine Woods.

## RTK, Canadian-style

Across the border in Edmundston, New Brunswick, Gaetan Soucy has been surveying using GPS techniques for more than eight

years. His GPS work was pretty conventional: setting his static on a known coordinate monument and using the controllers to set a small network that was then post-processed.

With the availability of an Active Control Station in most every Canadian city and a growing number of private control stations from which he can buy information, real-time corrections are always available. "While our system of control monuments up here has deteriorated and become less and less available, our newer network of Active Control Stations has nicely taken their place," Soucy says.

Using his Ashtech ProMark500 GNSS base station and rover RTK system, purchased from Gemini Positioning Systems Ltd. in Ottawa, Soucy can work without control monuments in the ground. "With the Active Control information, my base station location doesn't have to be known," he says "I just set the base anywhere, preferably a high point, and begin logging raw data.

Immediately and simultaneously I can use my rover, which is a time saver." He says that in his experience when he is within 10km of the control station he only needs to log an hour of raw data and at 40km he likes to log several hours.

In reviewing his RTK options, he found that base and rover systems that required cell phone communication with the rover did not meet his needs, since cell-phone coverage in the areas he works is generally unavailable. He requires UHF communication. The UHF radio at 2 watts that's embedded in his system has met every need.

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