

# Real Time Networking (on a Budget)

Our company, Coastal Surveying of TX, Inc., is located in a Galveston County, Texas, which is about 40 miles south of Houston. We wanted to have the capability of using a Real Time Network for our GPS collections, but we are far enough away from Houston that the major RTN network providers have not expanded their systems far enough South to cover the area that we work in. This left us with two choices; wait for the expansion of the existing networks to cover our area, if and when that might occur, or to build our own.

Building our own RTN network seemed like a daunting task when we first envisioned it, but it was much simpler than we imagined. It involved a through look at hardware components needed, and a small amount of time to configure the network. After thoroughly researching the GNSS solutions

in the market which met our requirements, we selected the Delta-G3T from JAVAD GNSS. With the 1 Hz RTK Rate and Ethernet options installed, you get access to what JAVAD calls TCP Output (TCPO). TCPO allows us to stream RTK (RTCM 3, CMR/CMR+, RTCM 2.x, etc.) corrections directly out via the Delta-G3T's Ethernet port to the Internet.

One of the major advantages of the Delta-G3T is that with the Ethernet option activated the remote base station does not have need for a computer at each site, which minimizes the cost of installing each of the reference stations, all that is needed is the Delta-G3T, an antenna, and an internet connection. The next major advantage of this configuration is that all of the management of the reference station can be handled by any computer with internet access anywhere in the world, this involves updating firmware, starting and downloading static sessions, output port configuration and station location.

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>> By Stephen Blaskey, PS

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It is nice to know that if the station ever needed to be reset or changed, I do not have to drive to the station and do what is needed, it all can be done from my desk in real time.

All of these operations are done with the JAVAD GNSS NetHub software, which is a free download. And the savings involved in not having to purchase Reference Station management software was a large factor in our choice to purchase JAVAD receivers. This savings alone could have almost funded the entire purchase and implementation of our three station RTN network.

Another bonus with JAVAD receivers is I can upgrade them in the future. I can add Galileo and COMPASS tracking or their GLONASS 2mm Dynamic Calibration option by simply placing an upgrade order and installing a new Option Authorization File (OAF). I can do it in a couple of minutes, all through the Internet.

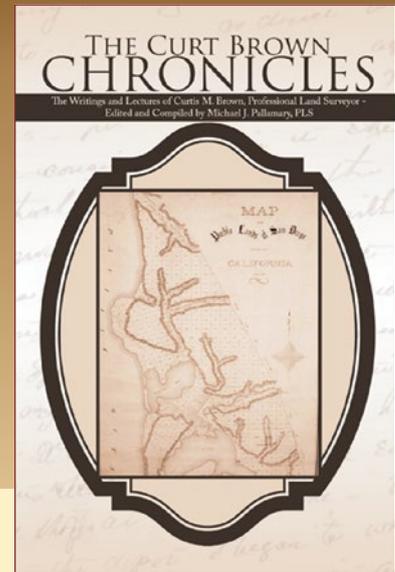
Another factor we considered in the choice of RTN hardware was the ability of the RTN network to be compatible with all of our existing RTK GPS hardware. We currently have a number of Topcon, Spectra Precision and Trimble GPS receivers and we did not any of them to be unable to work with our new RTN system. With all of the RTK message formats available in the JAVAD TCPO, all of our equipment, and equipment we rent, have all been able to work with this system seamlessly.

Currently, we're streaming corrections directly out to the internet but we could also use NetHub to distribute corrections via NTRIP. Using NTRIP, we could restrict access with a username and password and consolidate all of our correction sources. We can even stream corrections out via TCPO and NTRIP simultaneously. A single Delta-G3T base station can support 500 simultaneously connected rovers. This capability does not require a PC, additional software, Internet servers or anything. As a result, all of our rovers are able to work 24/7 at a fraction of the cost of the other manufacturer's solutions. *AS*

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Curtis M. Brown is best known for his textbooks, *Evidence And Procedures For Boundary Location*, and *Boundary Control and Legal Principles*.

Author Michael J. Pallamary, PS, has compiled the writings and lectures of Mr. Brown into this important addition to every land surveyor's library.

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