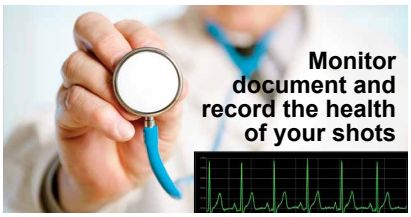
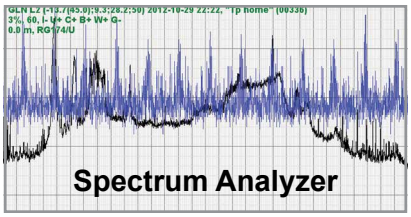
Innovations and features that only we have



Verify, Monitor, record, and defend the accuracy of your shots with our six different RTK engines and verification systems. Export results in PDF and HTML formats.

5 Hz BEAST MODE RTK resolves ambiguities 5 times faster. This is not extrapolating the 1 Hz base data. Base transmits correction data 5 times per second.



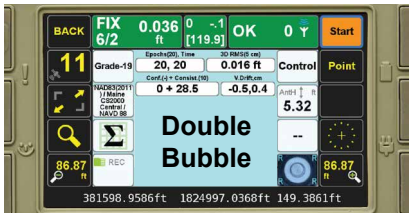
Interference in the GNSS spectrum exists in many places. Monitor and avoid it with the TRIUMPH-LS.

Multipath acts like a “ghost” signal and degrades the accuracy of your shots. We isolate multipath effects in both code and carrier phase measurements and remove them.

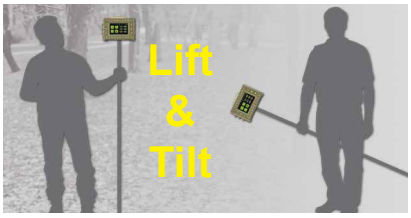
Mount your base on top of your car; park it near your job site and perform RTK survey. Then DPOS-It or Reverse-Shift-it.

Don’t break out the Total Station! Complete the job with the TRI-UMPH-LS only.

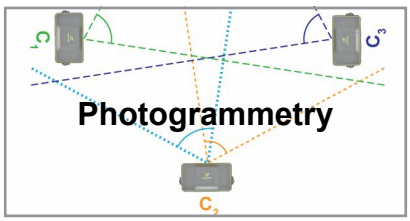
Highly rugged. Gorilla Tested, 180 pounds of surveyor driving it into the pavement. Also, check out our concrete drop test on www.javad.com



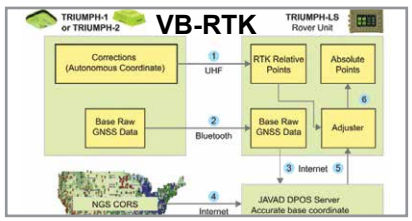
Bottom camera shows Double Bubble on the screen and documents it. Also, you can use these physical bubbles to calibrate the built-in electronic tilt sensors.



Survey starts with you lift the pole. You don’t need to level the rod, tilt sensors and compass automatically compensate for tilts.

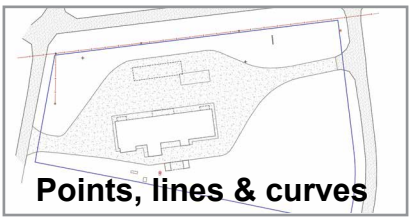


You can survey points that you or GNSS signals can’t reach. Camera Offset Survey (Photogrammetry in the box) with the internal forward facing camera.

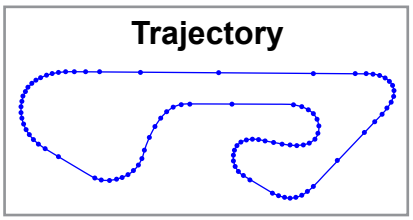


Process data collected at the base with OPUS or DPOS and automatically verify your shots. It basically ties your shots to the well-established NGS/IGS base stations.

The most comprehensive world-wide Coordinate Systems, transformation and localization, including “time dependent” coordinate systems.



Survey Points, Lines and curves automatically. No need to codes like BOC, MOC, and EOC, or others.



The deeper the curve, the faster points will be recorded automatically for accurate representation of trajectories.

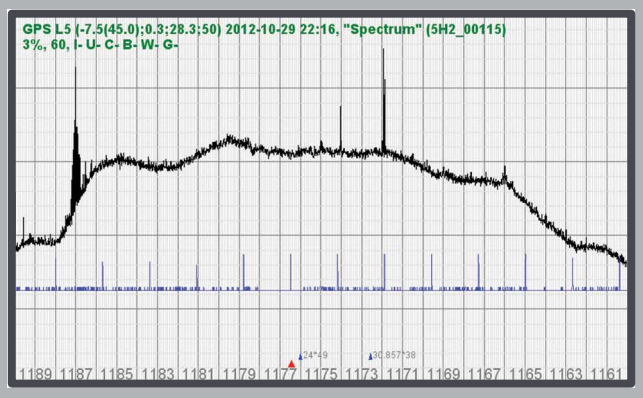
Append your shots with audio, photo and other technical and meta files automatically.

Monitor and avoid Interference with the TRIUMPH-LS

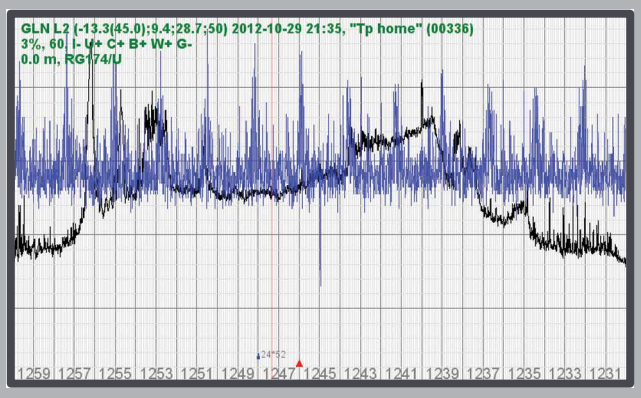
Radios
TV's
Radars
Harmonics
GSM
LTE
&
intentional
Jammers

Have you noticed in some places on some days that your receiver does not operate as it should? Intentional and unintentional interference appears almost everywhere. The Triumph-LS has the best available interference protection. It is the only receiver that monitors and reports interference graphically and numerically. Over 100 channels are dedicated to continuous interference monitoring.

Interference awareness is a must when performing GNSS work. It allows safe GNSS operation in a city, airport and military environment.

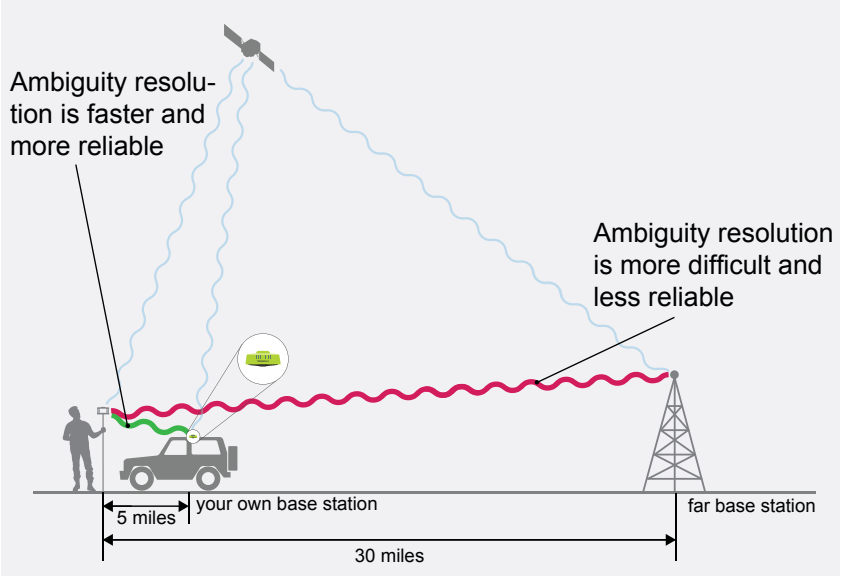


Some interference



Big interference

Advantages of your own base station and short baselines



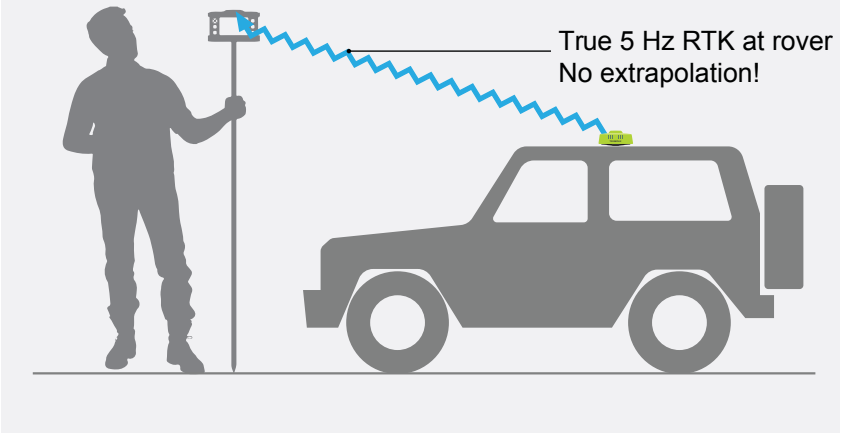
1. Shorter baselines provide significantly better **reliability** because the ambiguities are much easier to resolve and the correct ambiguity solution has an obvious contrast.

2. Shorter baseline has better **accuracy** because most of errors (like atmospheric and tropospheric effects) are common and cancel.

3. Shorter baseline ambiguities are resolved much **faster**. In longer baselines, incorrect ambiguities may pose as being correct in the statistical evaluations and it takes longer to isolate incorrect ambiguities.

4. Shorter baselines make it feasible to work in **difficult** areas (under tree canopy and in urban environments) because ambiguities have better contrast and are easier to resolve.

5. **Beast Mode RTK** is available only via our TRIUMPH-2 and TRIUMPH-1M base station. It makes ambiguity resolution up to 5 times faster because base station transmits base data 5 times per second. 5-Hz Beast Mode RTK is totally different from the up to 100-Hz RTK that is done by extrapolating the same 1-Hz data 100 times per second AFTER the ambiguities are fixed. This extrapolation technique does not improve the ambiguity resolution speed and is mainly used in applications like machine control after the ambiguities are fixed.



6. In addition to savings due to speed and reliability, it saves you RTN and communication charges. A complete system, Base + Rover + Radio + Controller & Controller Software, starts at **$19,990**. 0% financing available ($1,537.69 per month for 13 months) to active license US Professional Land Surveyors (PLS). Extended finance terms also available

contact **sales@javad.com** for details.

1 Equip your car

Mount the TRIUMPH-2 and radio on top of your car or truck. You can use either **UHF or FHSS** (Frequency Hopping Spread Spectrum) radios. You may want to bolt them down in your car for everyday use. FHSS does not need a license but its range is limited to a couple of miles. UHF has a longer range (up to 50 miles with a 35 Watt amplifier) but it needs a license. FHSS is particularly helpful in connection with our Beast Mode RTK which provides corrections from a TRIUMPH-2 near your job site. Use an appropriate long whip UHF/FHSS for longer range transmission.

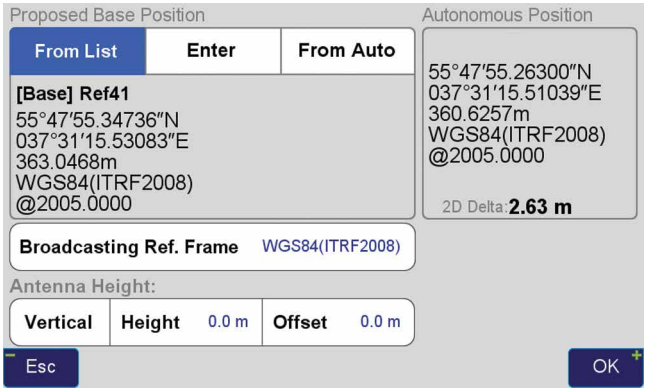
HPT401BT
1W UHF Radio

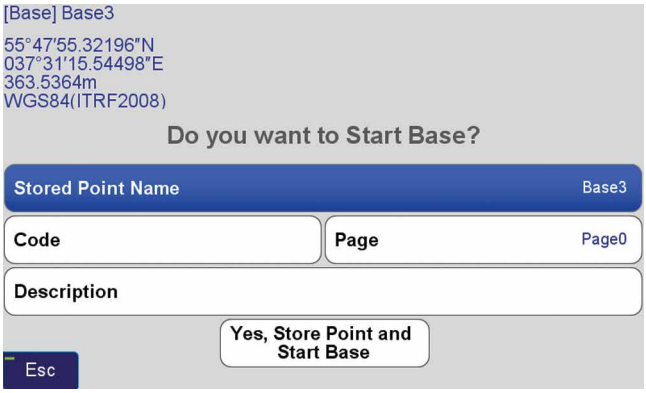
TRIUMPH-2
GPS+GLONASS
L1/L2

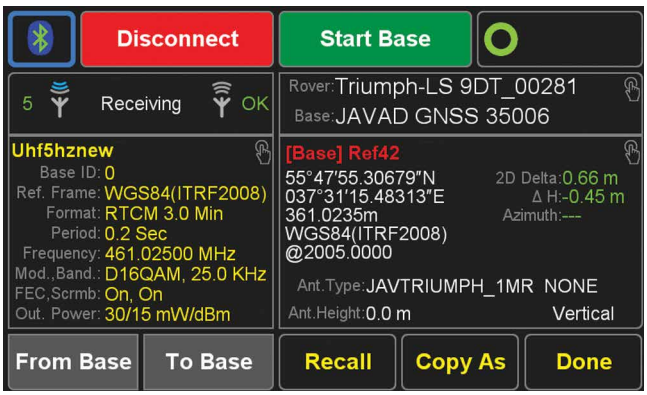
2 Park your car, Start Base

Park your car in an open area near your job site. It may be even in the middle of your site job. Engage all the brakes and ensure the car will not move. The Base/

Rover Setup screen makes it easy to configure the base and rover with the same parameters.
Use "**Auto**" for the base coordinate. "Auto" will use an autonomous solution as the base coordinates which may be off by several meters (this will be corrected later). Then click **Start Base**.

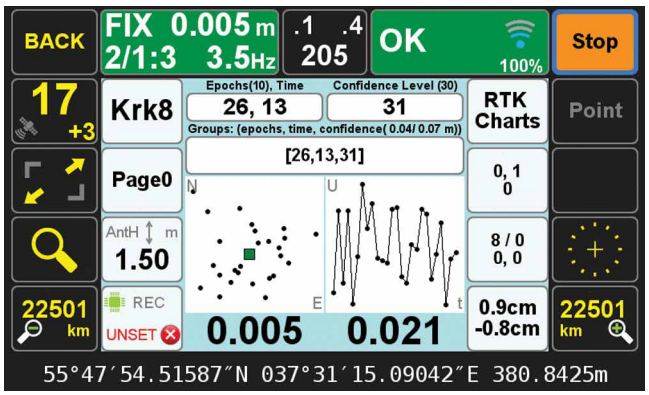




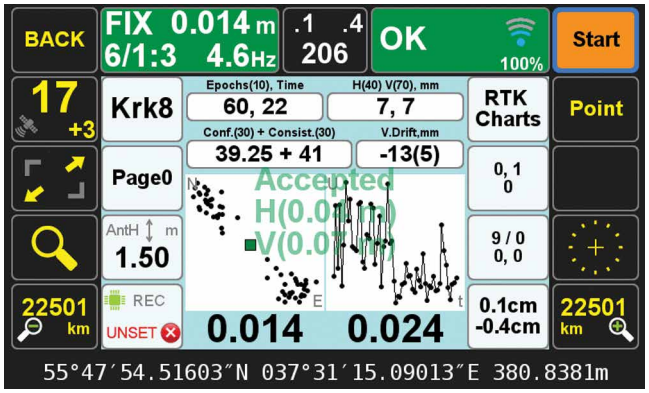


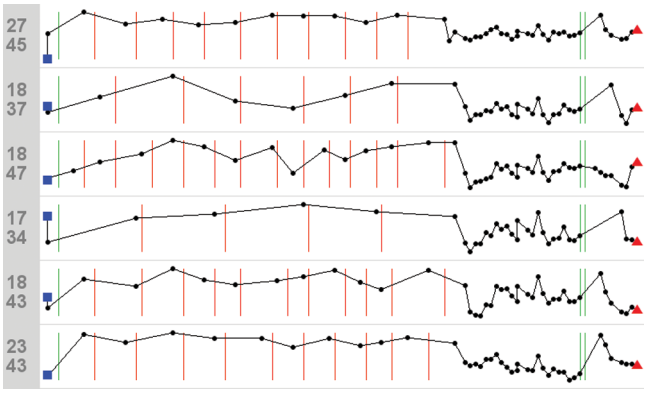
3 RTK Survey

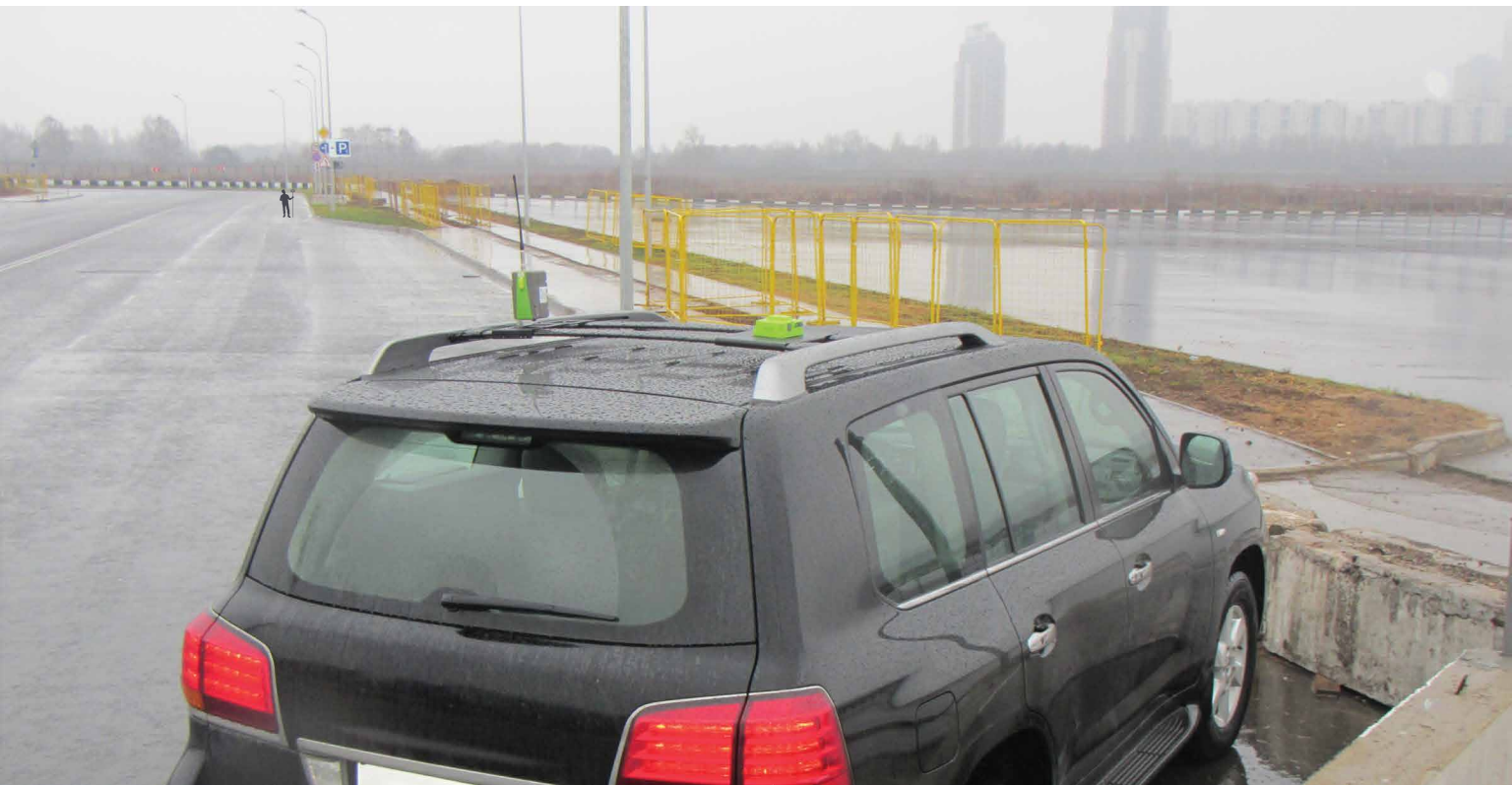
Use your rover to perform your tasks. We have combined UHF and Spread Spectrum Frequency Hopping (FHSS) in the same module in TRIUMPH-LS as an option. The automatic "**Verify**" feature (Phase-1 and Phase-2) ensures that you will never get a wrong solution.



Since your RTK baselines are short, you benefit from all advantages that we discussed earlier BUT all your rover shots are shifted by the offset error of the autonomous base coordinates (up to several meters). "DPOS-It" or "Reverse-Shift-It" to correct for the error from the autonomous position.



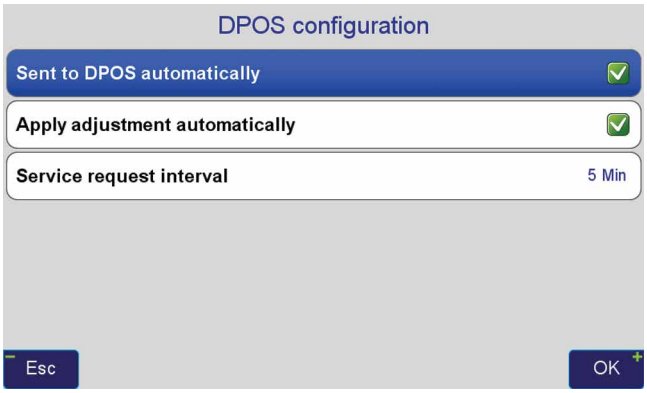


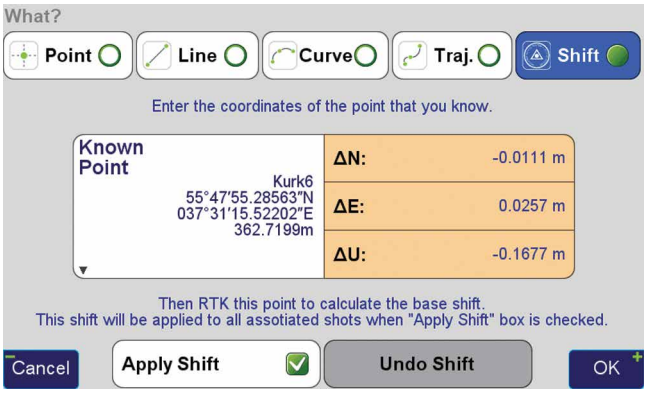


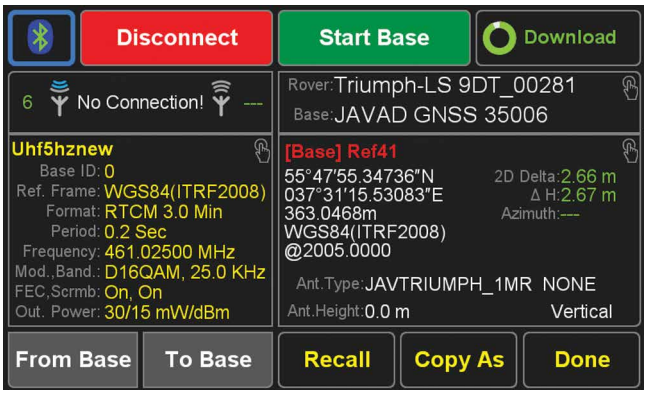
4 DPOS-it or Reverse-Shift-it

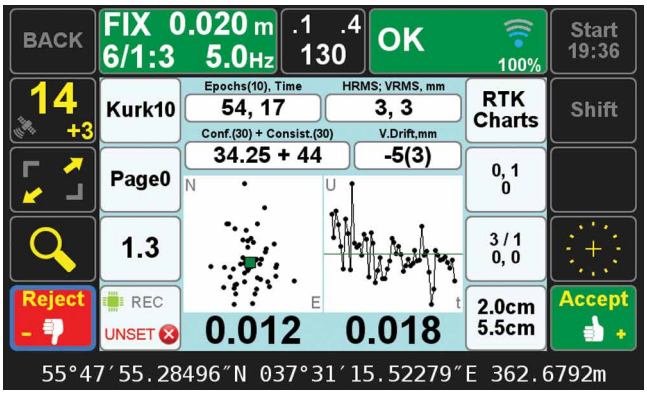
DPOS-it:
Press Stop Base and this will automatically **download** the raw GNSS base data to TRIUMPH-LS and send it to **DPOS** for processing with data from nearby CORS receivers. The TRIUMPH-LS then receives the **correct coordinates** of the base and **shifts** all the rover points accordingly. DPOS, CORS data and J-Field's RTK Verification guarantee your rover solutions.

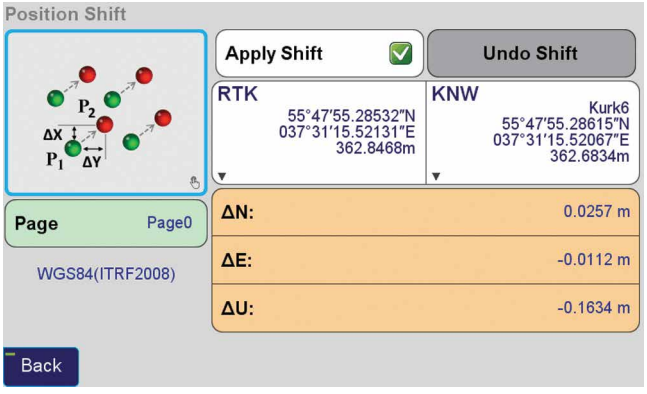
Reverse-Shift-it:
1) Take the TRIUMPH-LS to a **known point** and select the "**Shift**" function in the Setup Advanced screen. 2) Enter the **known coordinates** of that point. 3) Take a **shot** at that point and a base station shift will be **calculated and applied** to all previous and subsequent points surveyed in this session. You can then also use the newly surveyed points as known point for leap frogging during the project.



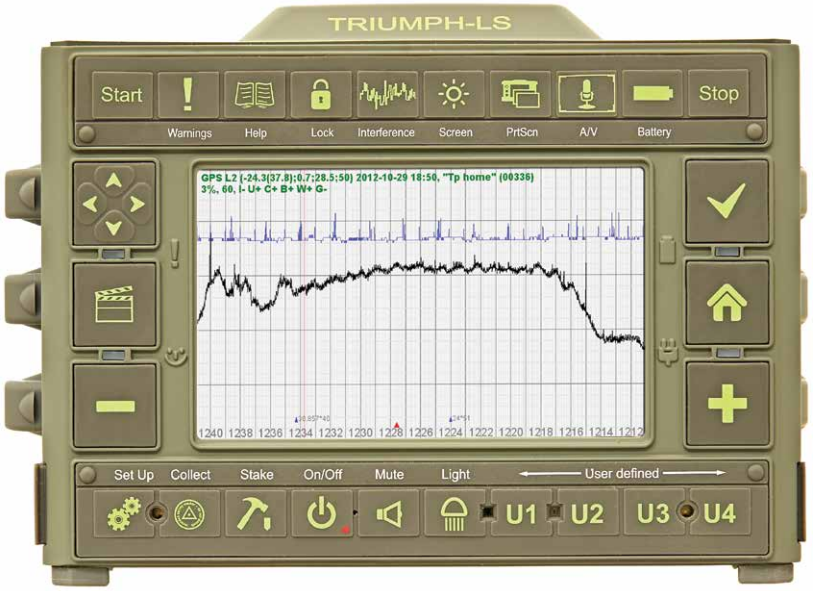




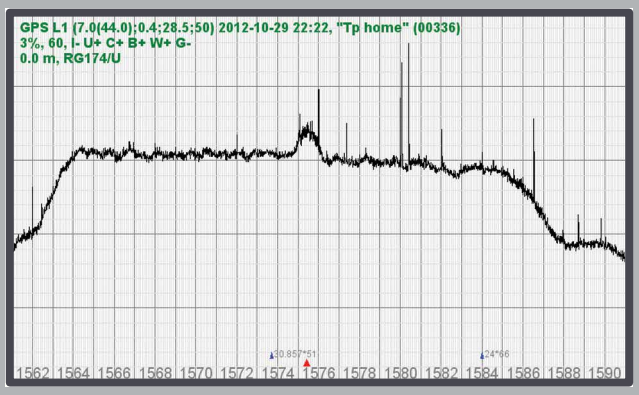


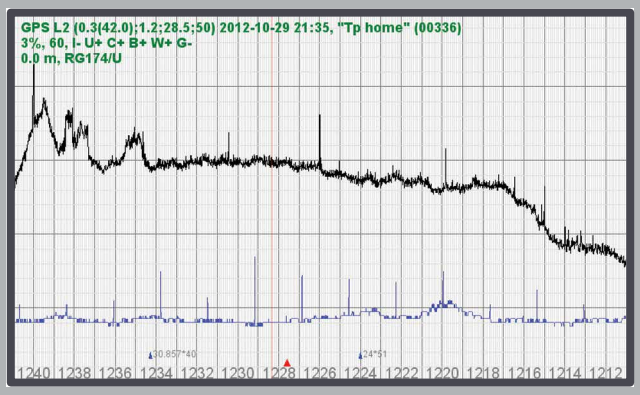


See who jams your GNSS

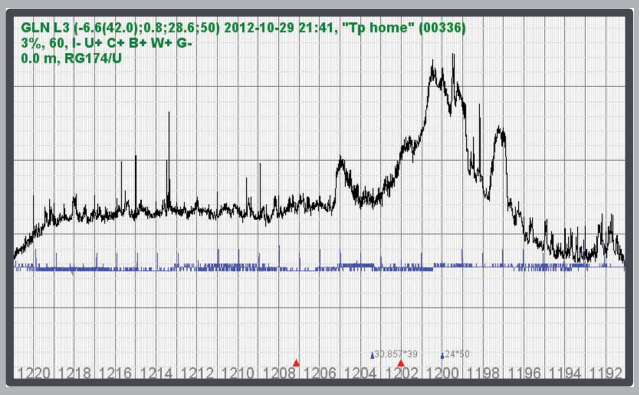


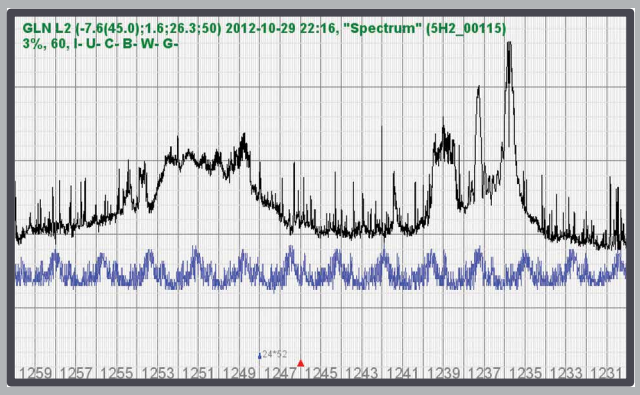
Now you can "view" interferences in your environment before starting your job and see if RTK is degraded.





Actual examples of somewhat clean GNSS environment.





Actual examples of noisy GNSS environments. People could not use some signals and did not know why.

REVERSE SHIFT<<it

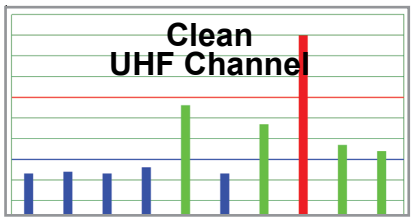
Setup base anywhere. Put the rover on a known point and click reverse “SHIFT”. The base correction will be applied to all past and future points in that session.

the most advanced GNSS chip with 864 GNSS channels, 24 digital filters and 24 anti-jam filters to protect against out-of-band and in-band jammers.

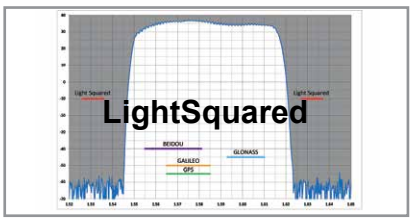
RAMS

Remote Assistance & Monitoring Services

Monitor and control the activities of your field crews from the comfort of your office via a PC, iOS/Android device. It is also a great tool for training and receiving support.

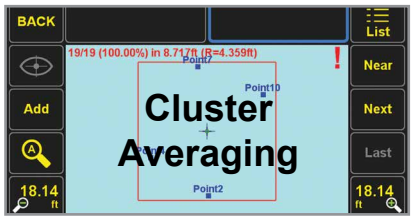


Similar to monitoring the GNSS bands, monitors and scans all UHF bands and shows interferences in all channels. It assists you to select the cleanest channel.



We told you so! LSQ issue was political and financial. Some editors, professors and generals must now eat what they wrote and testified. We do have J-Shield filter.

Fully integrated, all antennas, radios, controller, high resolution sunlight readable display, over 20-hours of internal batteries 2.5 Kg (5.5 lb) including monopod.



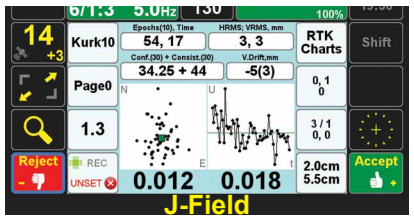
If you are required to repeat your shots we find clusters and average them automatically. You don’t need to make any attempt to manually tie shots together.

DPOS

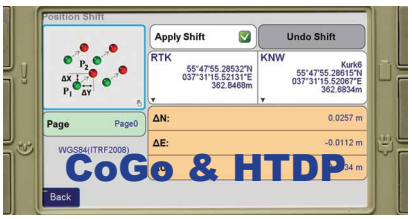
Data Processing Online Service

DPOS is similar to OPUS but processes GLONASS when available. It also applies corrections to the base coordinate and all RTK solution as mentioned in VB-RTK.

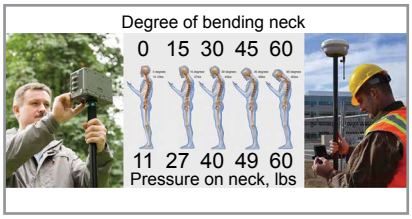
Visual Stakeout overlays stake points on top of the camera image to easily guide you to the stake point. A nice virtual reality.



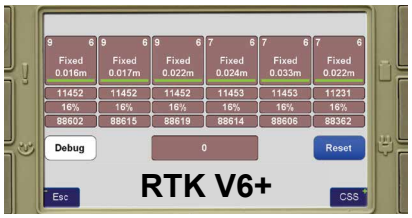
Horizontal and vertical graphs of every epoch along with statistical data can automatically be recorded with each point for documentation and protection.



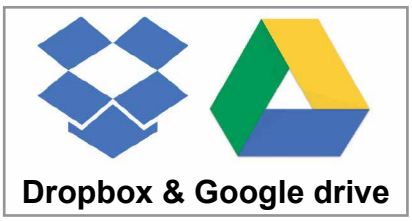
TRIUMPH-LS has the most comprehensive COGO functions (grid, ground and geodetic surfaces) and Time Dependent Transformations (US, HTDP)



They all break your necks! TRIUMPH-LS does not. Looking down puts 60 lbs of pressure on your neck. Look straight!



Six RTK engines plus one support engine provide robust RTK performance, even in challenging environments.



Send your survey results to Dropbox and Google Drive automatically.

You can quickly measure angles with the internal forward facing camera of the TRIUMPH-LS.

See detailed descriptions and more at www.javad.com

All these unique features at price of $12,990