

JAVAD

TRIUMPH-LS





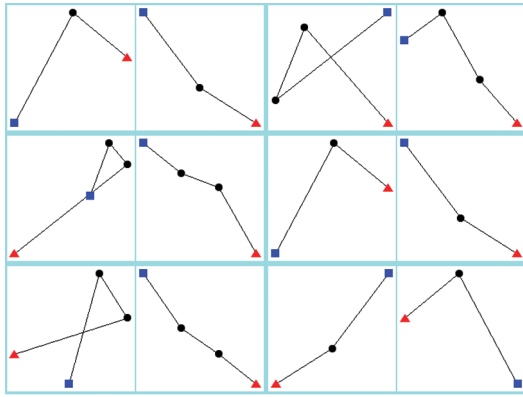
WORKING WITH THE TRIUMPH-LS RTK Verification

Javad,

Just a note of appreciation. Thank you for implementing so many of my requests. We're doing real work with this receiver: boundary, topographic and staking. The staking routines are very productive. Every release of the software gets better and better. The hardware is solid, showing great promise in a range of environments. I was skeptical of the all-in-one box approach, but you are winning me over every time I take it out. You're breaking new ground and this system is unlike anything I've ever used.

*Shawn Billings
Billings Surveying and Mapping Company*





RTK Verification

Fundamental in the determination of GNSS solutions is calculating the correct number of full wavelengths (so-called **fixing ambiguities**) in order to figure out the distances from the satellites to the receiver. In doing Real Time Kinematic (RTK) surveying, we need it fast and we need it to be correct.

Multipath, the reflections of GNSS signals from nearby objects and structures, create their own indirect measurements from the satellites to the GNSS receiver. It's as if your measuring tape is bent around an obstacle like a tree instead of a free and clear line of sight between two points.

No calculator is going to improve that result. This sort of indirect measurement is analogous to the issue involved with GNSS signals when they're being reflected from nearby objects, including the ground. Worst case is when the receiver doesn't see the direct signal at all; e.g., the satellite is behind a building, but it's still receiving the signal reflected off of the nearby structure. Such indirect signals are usually strong, unhelpful and misleading.

The other aspect impacting the veracity of a fixed solution is when there are weak GNSS signals. Frequently, weak signals are due to their penetration directly through tree canopy.

While **J-Field** can't move the obstacles that are creating multipath out of the way, its sophisticated engineering is designed to handle even the weakest signals like no other system with its **RTK Verification System** (patent pending).

J-Field uses six RTK engines running in parallel and that are solely devoted to isolating the indirect signals by using different sets of satellites, each engine with its own and differing criterion. If too many of the signals are indirect, no solution may be found. Remember, indirect signals are analogous the bent measuring tape! **J-Field's** robust set of engines are tasked with finding these indirect measurements and then removing them. When you're doing RTK surveying, observe your environment and come to recognize that the structures around you are like mirrors for GNSS signals.

J-Field provides the option for you to specify the **Minimum Number of Fixed RTK Engines** in verifying solutions **N** times before a position is automatically accepted where **N** is a user defined value (up to a total of 16 times).

Procedure

As of J-Field beta v1.10.3.12842, begin by making sure that you have selected "When To Stop" as "Timed". This is necessary in order to activate the automated RTK Verification System. The timed observation session option is easy to turn on and only one tap away.

In Collect screen₁ (Collect Prepare), tap on the lower middle button shortcut to quickly modify details of your Setup by bringing up the Quick Setup screen. It's worth noting that this pertains to your

V6 test 01 1. Project	Me2k 2. Page	NAD83(2011) / Maine CS200... Coordinate System
DefTag 3. Tag	DefCode Code	--- 4. Code Attributes
S1 5. Point Name	Cardinal to 17U 6. Point Description	5.06 ft 7. Antenna Height
Review	View	LS Rover 10:30 Next

Notes about this button:
 Name of Setup: LS Rover
 When to Stop: Timer on
 Tilt & Compass Correction On/Off

currently active setup. In the example above the name of the setup is LS Rover. The changes you make through the Quick Setup screen are retained (saved) automatically allowing for easy recall of other previously defined setups.

Quick Setup (LS Rover)

How to Start?

Start Button When Lifted Delay

When to Stop?

Stop Button When Tilted After

Auto Accept No Correct for Tilts Verify

Accuracy Record GNSS More Settings

Auto Re-Start Revert Code to Tag default

Esc OK

Total Measurements

NONE	total 2 times	total 3 times	total 4 times
total 5 times	total 6 times	total 7 times	total 8 times
total 9 times	total 10 times	total 11 times	total 12 times
total 13 times	total 14 times	total 15 times	total 16 times

Esc

In this example, the timer will stop the session after 20 seconds, but you can choose any length of time that suits your needs and in combination with your

previously determined epoch interval.

You can also completely change setups by tapping on More Settings which will bring up the main Setup screen allowing you to recall the one you want and then return immediately back to the Quick Setup screen.

Next, tap on Verify to 1) set the number of times (N) that automated verification will take place (or to NONE), 2) turn on the RTK Verification system - Make sure to check the box "Reset RTK before Each Verify", and 3) to specify the Minimum Number of Fixed RTK Engines in verifying solutions N times. Once you've settled on your RTK Verification System settings you'll be returned to the Collect Prepare screen, tap Next or press the Action key.



From the Map Screen you can quickly

Verify Settings

Verify

Reset RTK Before Each Verify

Accept Number of Fixed RTK Engines

Esc OK

Minimum Number of Fixed RTK Engines

At least 1	at least 2
at least 3	at least 4
at least 5	at least 6

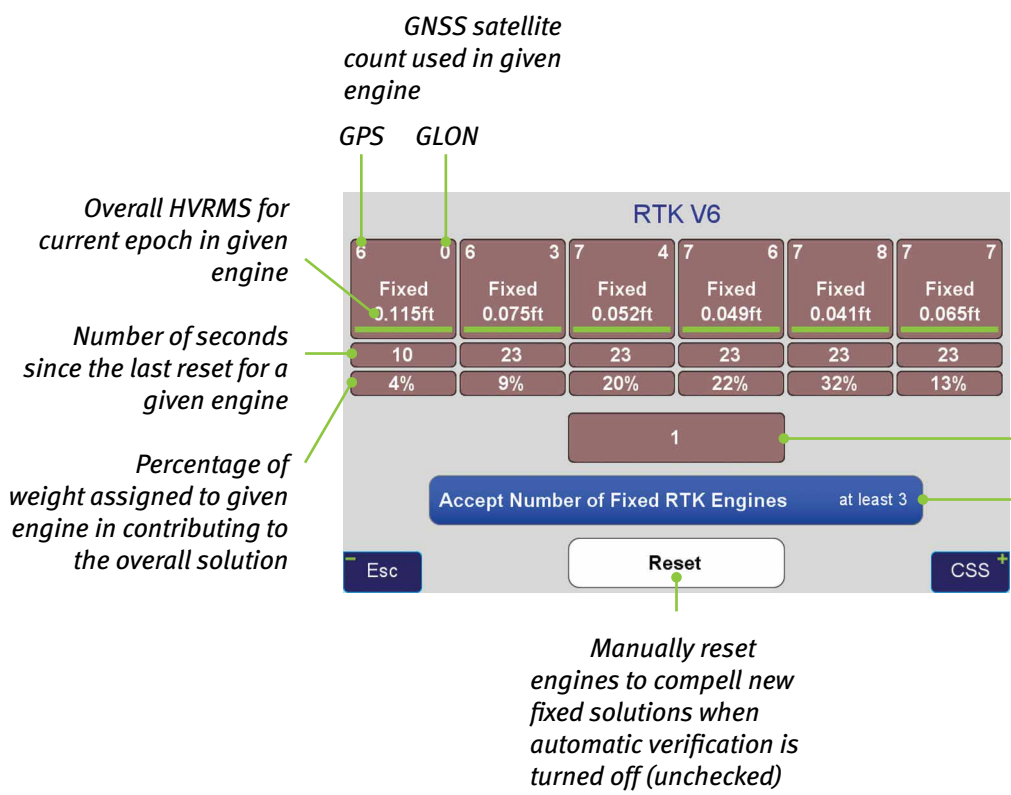
Esc

make adjustments to your RTK Verification settings and to check in on the RTK Engines' status by tapping on the upper left box displaying STN, FLT or FIX.

Javad's recommended settings: Timer set to 10 seconds; Verify 3 times; minimum number of RTK engines 1 or 2.

See the next two illustrated anatomy of these two screens.

Screen Anatomy – RTK V6



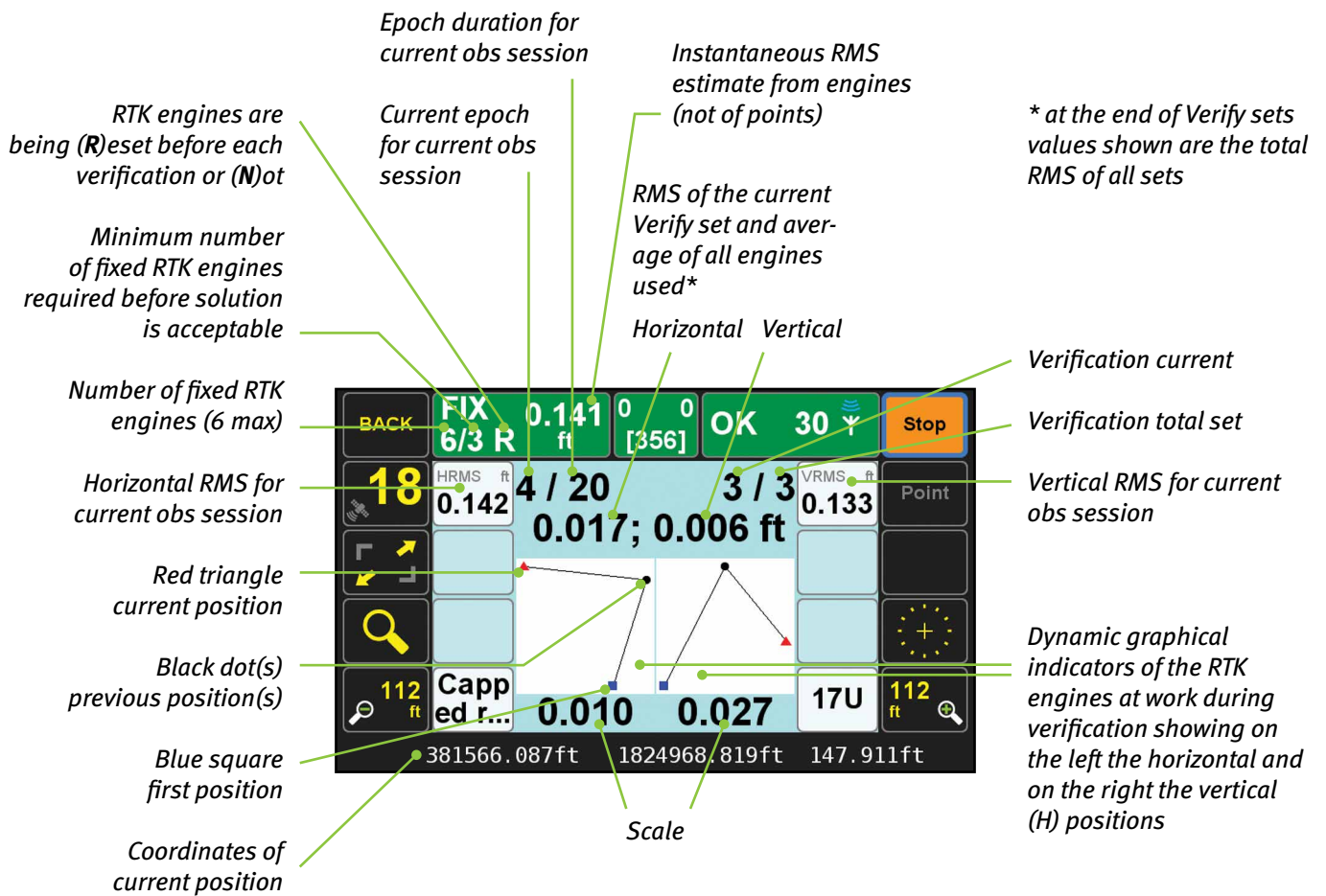
A user definable threshold showing delay in seconds in receiving corrections from base; values up to 30 seconds are acceptable (OK) causing only a few mm of error; if you're broadcasting your FCC call sign, expect to see its brief interrupting effects every 15 minutes here and elsewhere; e.g. hand scanner, Action screen and UHF status screen.

Tap this button to change the Minimum Number of FIXED RTK Engines to use for automated verification.

Manually reset engines to compell new fixed solutions when automatic verification is turned off (unchecked)

Screen Anatomy – Map Screen

a/k/a Action Screen and Collect screen2



Please refer to the section of the guide discussing the Collect screen for further detailed information



So easy my 12 year old can do it.

Matthew D. Sibole, PLS

Here are some photos of my boys helping me survey out in the desert yesterday.

Jack M. Smith

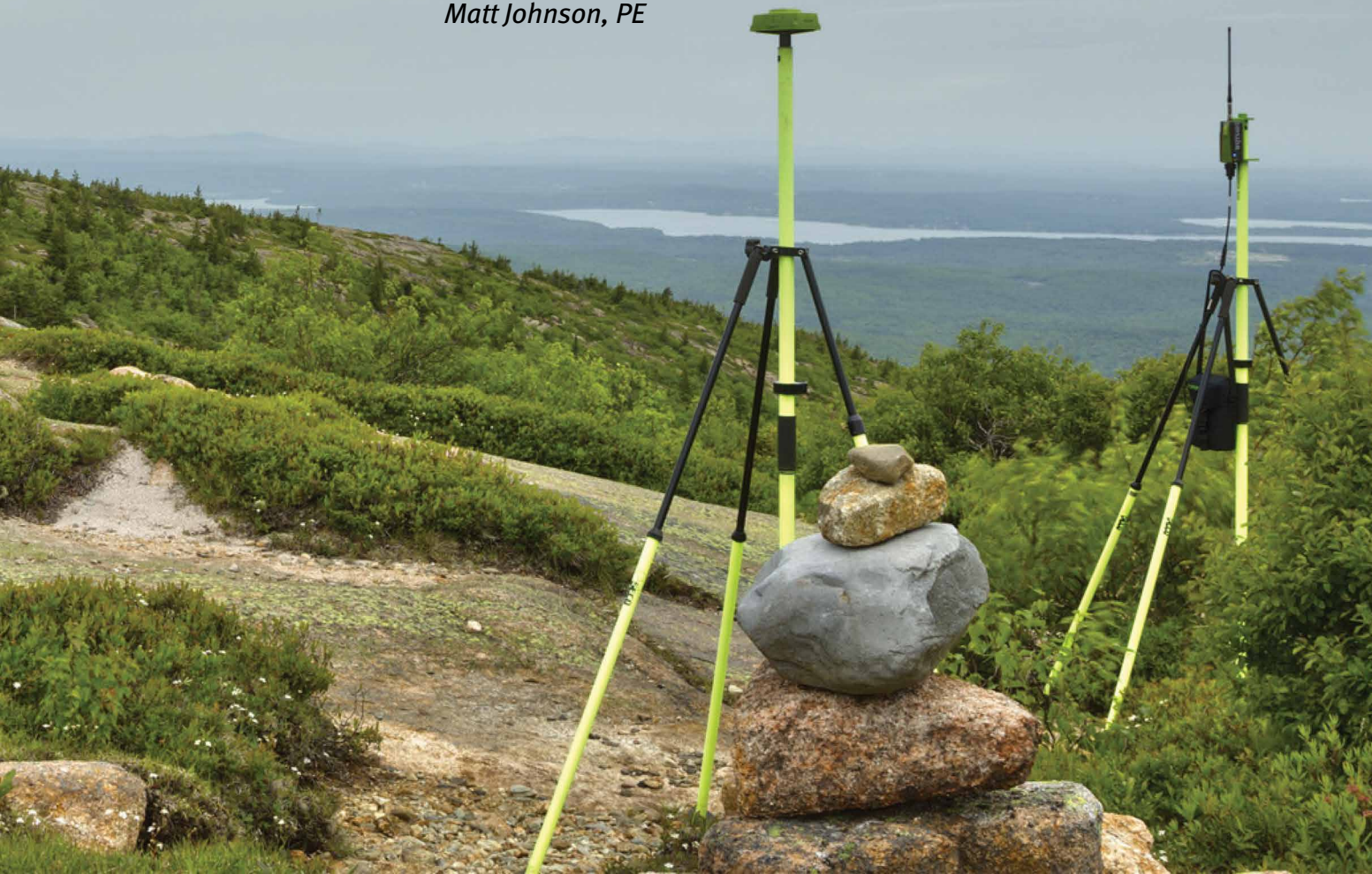
- The adjustable and telescoping pole is lightweight and easy to collapse. This will make it easy to walk through woods and put into a car to drive around.
- The built in compass makes it very easy to stake out points. The stakeout screen points you in the right direction and gives you the distance to the point.
- Long battery life (24 hours)
- It seems to fix reliably in locations where other receivers would stand a slim chance of fixing.

I worked with the TRIUMPH-LS and Triumph-2 today for a few hours. I was impressed with the ability to get a good repeatable fix in pretty thick tree cover.

I also was able to localize on an assumed coordinate system without too much trouble. I don't do this very often but was able to localize three times today (2 times just to write down try and memorize the process).

Matthew D. Sibole, PLS

Matt Johnson, PE



VICTOR-LS



Rugged
hand-held controller
with J-Field
application software.

See www.javad.com for details