

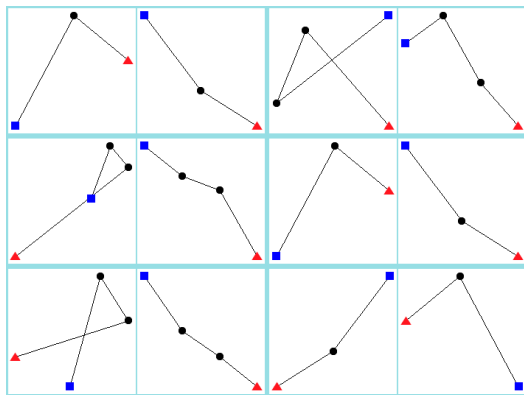


WORKING WITH THE TRIUMPH-LS

RTK Verification

J-FIELD v1.10.3.12842
June 29, 2014





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 Sys-**

V6 test 01	Me2k	NAD83(2011) / Maine CS200...
1. Project	2. Page	Coordinate System
DefTag	DefCode	---
3. Tag	Code	4. Code Attributes
S1	Cardinal to 17U	5.06 ft
5. Point Name	6. Point Description	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

tem. 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 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 None

When to Stop?

Stop Button ☒ When Tilted ☒ After 20 sec ☒

Auto Accept No Correct for Tilts ☒ Verify NONE

Accuracy > Record GNSS ☐ More Settings

Auto Re-Start ☐ Revert Code to Tag default ☒

Esc OK

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**

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

Verify Settings

Verify
total 3 times

Reset RTK Before Each Verify ✓

Accept Number of Fixed RTK Engines at least 3

Esc
OK

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 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.

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

See the next two pages of this guide for an illustrated anatomy of these two screens.

Screen Anatomy - RTK V6

GNSS satellite count used in given engine

GPS GLON

RTK V6

overall HVRMS for current epoch in given engine

number of seconds since the last reset for a given engine

percentage of weight assigned to given engine in contributing to the overall solution

Accept Number of Fixed RTK Engines at least 3

Reset

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

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

GPS	GLON	Fixed HVRMS	Seconds since reset	Weight %
6	0	0.115ft	10	4%
6	3	0.075ft	23	9%
7	4	0.052ft	23	20%
7	6	0.049ft	23	22%
7	8	0.041ft	23	32%
7	7	0.065ft	23	13%

1

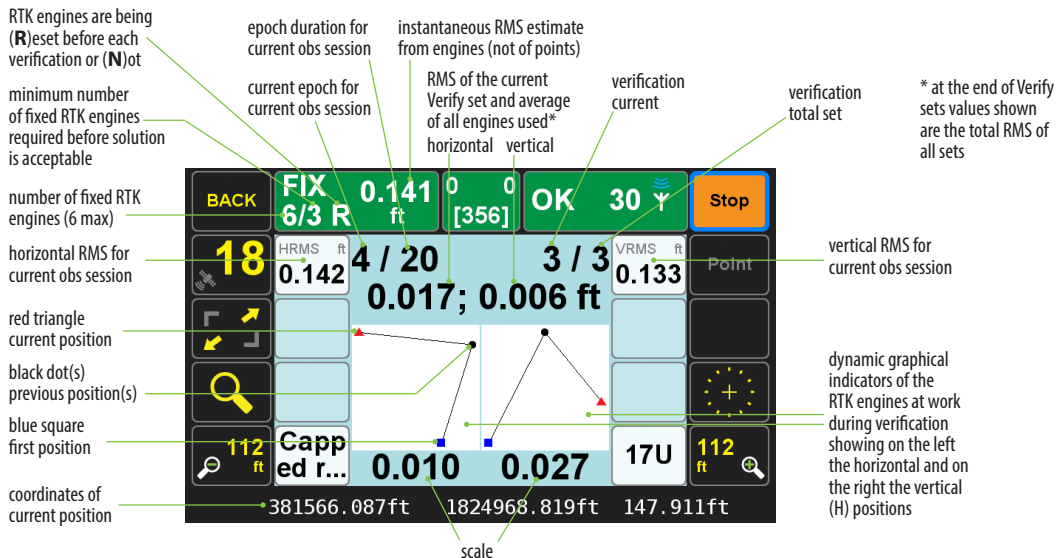
Esc

Reset

CSS

Screen Anatomy - Map Screen

a/k/a Action Screen and Collect screen2





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