

Base/Rover Setup

If RTK corrections are to be transmitted via UHF radio from your BASE receiver to your ROVER, there are a few settings that will need to be transferred onto the Base receiver.

Depending upon which type of receiver that you're using for your base, the task may be accomplished in more than one way, or possibly unneeded altogether; for example, if you have two **TRIUMPH-LS** receivers, the transfer of the BASE Setup might not be needed if it was already present to choose from on both units.

Other options for setting up the BASE may be afforded using **Javad Mobile Tools** and your mobile device and either the **iOS** or **Android** developed by JAVAD GNSS - see website for details.

For the purposes of this article; however, the **TRIUMPH-2** is used as the BASE receiver with its various particulars transferred using the **TRIUMPH-LS**. If you're using Spread Spectrum,

the discussion is similar, but your range may not be. Also, for the purposes of this article, it is assumed that you have already followed the directions for defining your BASE receiver's Setup as discussed in the section entitled **My Default Base Setup** (p. 71) and its sub-section entitled **RTK via UHF** (p. 104). You must have an existing Rover Setup previously defined that uses UHF in order to set up the Base as discussed in the section entitled **Define the RTK Rover Setup** (p. 120)

The transfer of the BASE Setup takes place in the field allowing you to immediately test the communications from the ROVER. It is also recommended that all communications be satisfactorily demonstrated *before* heading to the job site.

Follow the procedures and cautionary recommendations for the physical setting up of the equipment as outlined in the section entitled **Field Setup** (p. 36) starting with the UHF radio and its antenna connected before powering it on.

Corrections from your BASE receiver will be streamed via Bluetooth to your UHF modem before the radio relays those corrections to the ROVER via UHF. As previously outlined, keep your distances between the BASE and the radio reasonable.

Your radio and the **TRIUMPH-2** come from the factory already paired and communicating with each other out of the box. Both radio and receiver will show their blue LEDs lit indicating their link. Usually this only takes a few seconds. Rarely, if after waiting a few minutes, the receiver fails to show its Bluetooth indicator LED light as blue, the receiver and the radio may have become unpaired. Should this occur, **NetView** and **Javad Mobile Tools** are available to reestablish their pairing - see website for details.

From the Setup screen tap on **Base/Rover Setup**

Setup (MDOT)

NameMDOTNote

EditTags & CodesAdvancedSummary

RecallCopy AsDeleteCreate

Base/Rover SetupDelete All Setups

Assign Actions to U1-U4

Esc

Bluetooth

Connect

Connected

MDOT

Tap here to switch to "UHF" mode and set parameters OR "Recall" a profile.

From Base

To Base

Recall

Copy As

Done

Start Base

Rec1 Sec

Rover: TRIUMPH-LS VKB

Bluetooth

Connect

Connected

UHF RTK ROVER 461.050

Base ID: 4064
Ref. Frame: NAD83(2011)
Out. Power: 40 mW
Frequency: 461.05000 MHz
Modulation: DQPSK
Bandwidth: 12.5 KHz
Format: RTK - RTCM 3.0

From Base

To Base

Recall

Copy As

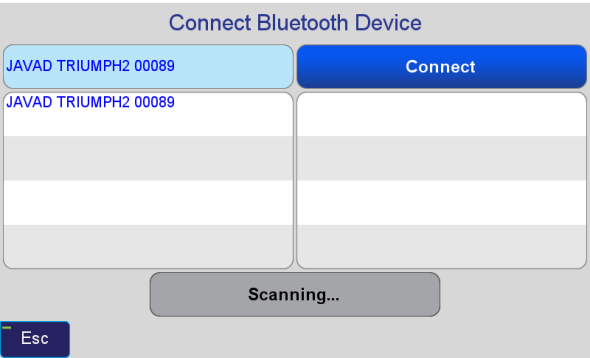
Done

Notice the tabular data on the left side. The top line is the name of the current RTK Rover setup, which in this case is not configured for UHF corrections as indicated by the prompt in the orange text beneath it. Should that be the case, tap on **Recall** and bring up a previously defined UHF Rover setup either from this Base/Rover Setup screen or from the main Setup screen.

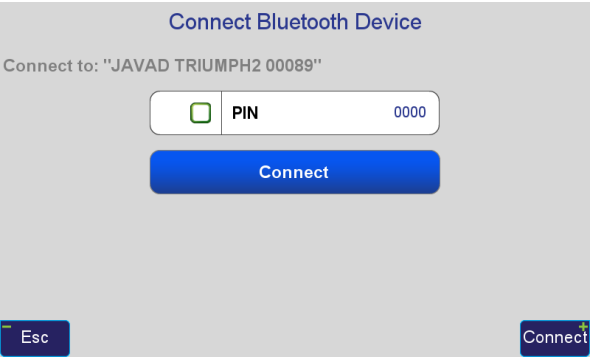
If your current Rover Setup is configured to use UHF, this data table will reflect the previous settings.

To connect the Base and the Rover via Bluetooth, tap on **Connect**

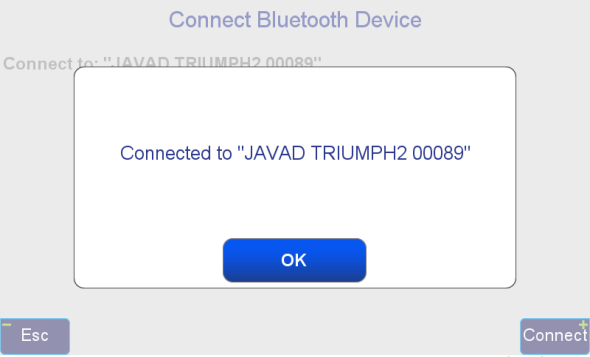
Immediately a scan of available Bluetooth devices will begin and a few seconds later will be completed. Choose the device intended to be used as the Base receiver and tap **Connect**.



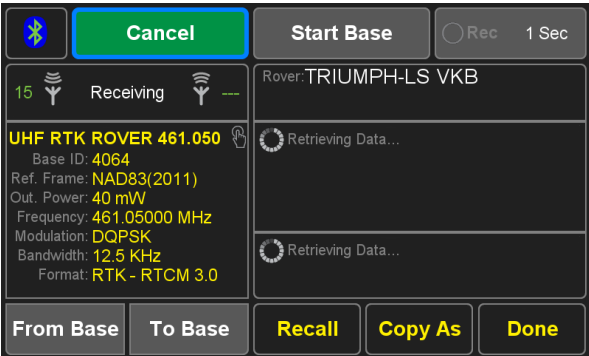
Leave the default credentials as shown and tap **Connect**.



Tap **OK**.

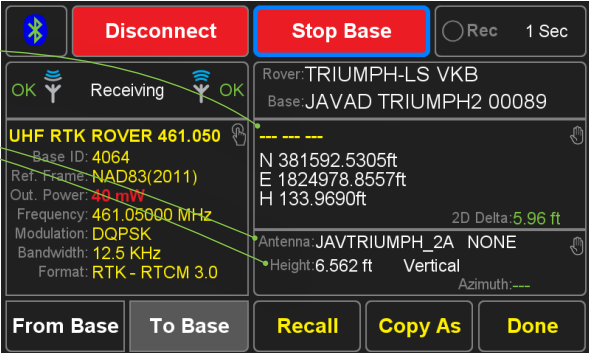


Once the Bluetooth connection has been initiated, it will take a few seconds before it has completed. During that interim few seconds, your screen may appear like what is shown on the right.

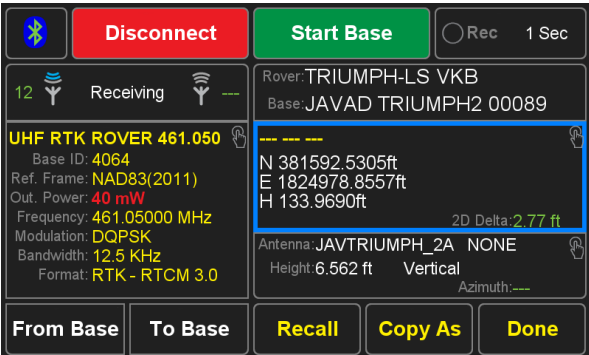


In this example, the **TRIUMPH-LS** has successfully connected to the **TRIUMPH-2** and has read the previously entered base coordinates while displaying them in the current Page's defined coordinate system. The antenna type and the antenna height are also shown.

If those previously entered values are valid; i.e., you're reoccupying the same station and your radio communications are unchanged, you're all set; otherwise you'll need to tap **Stop Base** to set the Base Coordinate or make other changes such as entering a different HI.



To make any changes to the Base coordinate, tap on the **displayed data**.



If the coordinate of the Base is already loaded on the **TRI-UMPH-LS** either as a previously Surveyed Point or Design Point, tap **From List** to pick it.

Another option is to enter the coordinate manually. Begin with a tap on **Enter** and proceed to fill out the values appropriate for the current page's coordinate system.

The third option is to use the **Autonomous** position of the Base receiver, noting that the Base's position used will be its *current* (1-epoch) position. Be aware that an autonomous position may have many meters of error in its actual location. To do so, tap **From Auto**.

Proposed Base Position

From List

Enter

From Auto

N 381592.5305ft

E 1824978.8557ft

H 133.9690ft

Broadcasting Ref. Frame

WGS84(ITRF2008)

Send to Base

Esc

Autonomous Position

N 381595.2390ft

E 1824979.4286ft

H 145.3141ft

2D Delta: 2.77 ft

Proposed Base Position

From List

Enter

From Auto

N 381592.5305ft

E 1824978.8557ft

H 133.9690ft

Broadcasting Ref. Frame

WGS84(ITRF2008)

Send to Base

Esc

Autonomous Position

N 381595.2664ft

E 1824979.4595ft

H 145.4246ft

2D Delta: 2.8 ft

Proposed Base Position

From List

Enter

From Auto

N 381592.5305ft

E 1824978.8557ft

H 133.9690ft

Broadcasting Ref. Frame

WGS84(ITRF2008)

Send to Base

Esc

Autonomous Position

N 381595.2516ft

E 1824979.4828ft

H 145.4636ft

2D Delta: 2.79 ft

Confirm that the appropriate Reference Frame has been selected and if necessary, tap **Broadcasting Ref. Frame** to make changes

Tap the appropriate selection

Tap **Send to Base**

Proposed Base Position

From List

Enter

From Auto

N 381595.2587ft

E 1824979.5207ft

H 145.3898ft

Broadcasting Ref. Frame

WGS84(ITRF2008)

Send to Base

Esc

Base Reference Frame

WGS84(ITRF2008)

NAD83(2011)

NAD83(PA11)

NAD83(MA11)

ETRS89

Esc

Proposed Base Position

From List

Enter

From Auto

N 381595.2587ft

E 1824979.5207ft

H 145.3898ft

Broadcasting Ref. Frame

NAD83(2011)

Send to Base

Esc

Autonomous Position

N 381595.2918ft

E 1824979.6027ft

H 145.4729ft

2D Delta **0.09 ft**

Autonomous Position

N 381595.1167ft

E 1824979.7050ft

H 145.9338ft

2D Delta **0.23 ft**

www.javad.com

Base/Rover Setup

115

Make any necessary changes to the Stored Point Name of the Base Point, Page, Description and Code

N 381595.2587ft
E 1824979.5207ft
H 145.3898ft

Do you want to send this coordinate to Base?

Stored Point Name

Point1

Code

Page0

Description

Yes, Store Point and Send to Base

Esc

Confirm changes and send to the Base receiver with a tap on **Yes, Store Point and Send to Base**

N 381595.2587ft
E 1824979.5207ft
H 145.3898ft

Do you want to send this coordinate to Base?

Stored Point Name

KILO

Code

Page0

Description

Yes, Store Point and Send to Base

Esc

To make any changes to the antenna HI, tap on the **displayed data**.

Note, if there aren't any changes needed to the antenna parameters, skip the next step

Disconnect

Start Base

Rec

1 Sec

118 Receiving

Rover: TRIUMPH-LS VKB
Base: JAVAD TRIUMPH2 00089

Base ID: 4064
Ref. Frame: NAD83(2011)
Out. Power: 40 mW
Frequency: 461.05000 MHz
Modulation: QPSK
Bandwidth: 12.5 KHz
Format: RTK - RTCM 3.0

2D Delta: 0.07 ft

Antenna: JAVTRIUMPH_2A NONE
Height: 6.562 ft Vertical
Azimuth: ---

From Base

To Base

Recall

Copy As

Done

Confirm changes made to the antenna parameters and send to the Base receiver with a tap on **Send to Base**

If desired, recording GNSS data can be started anytime during the Base/Rover Setup, to do so, tap **Rec**

To assign a desired recording interval, tap **Recording Interval**.

Antenna Parameters

Antenna Height6.562 ftVertical

Send to Base

Esc

Bluetooth

Disconnect

Start Base

Rec1 Sec

146

Receiving

UHF RTK ROVER 461.050

Base ID: 4064

Ref. Frame: NAD83(2011)

Out. Power: 40 mW

Frequency: 461.05000 MHz

Modulation: DQPSK

Bandwidth: 12.5 KHz

Format: RTK - RTCM 3.0

KILO

N 381595.2586ft

E 1824979.5208ft

H 145.3899ft

2D Delta: 0.89 ft

Antenna: JAVTRIUMPH_2A NONE

Height: 6.562 ftVertical

Azimuth: ---

From Base

To Base

Recall

Copy As

Done

Recording Raw Data

Recording Interval1 Sec

Enable Recording

Send to Base

Esc

Tap **a value**

Enable Recording on the Base receiver with the check box. Check to see that the orientation of the Base receiver is properly pointing north and then tap **Send to Base**. Recording will begin immediately.

To make any changes to the mutual communications settings for the Base and the Rover, tap on the **displayed data**.

Record Period

1 Sec

2 Sec

5 Sec

10 Sec

15 Sec

30 Sec

Esc

Recording Raw Data

Recording Interval30 Sec

Enable Recording☒

Send to Base

Esc

209 Receiving

UHF RTK ROVER 461.050

Base ID: 4064

Ref. Frame: NAD83(2011)

Out. Power: 40 mW

Frequency: 461.05000 MHz

Modulation: DQPSK

Bandwidth: 12.5 KHz

Format: RTK - RTCM 3.0

Disconnect

Start Base

Rec30 Sec

Rover: TRIUMPH-LS VKB

Base: JAVAD TRIUMPH2 00089

KILO

N 381595.2586ft

E 1824979.5208ft

H 145.3899ft

2D Delta: 1.16 ft

Antenna: JAVTRIUMPH_2A NONE

Height: 6.562 ft Vertical

Azimuth: ---

From Base

To Base

Recall

Copy As

Done

The Base ID is used to distinguish multiple bases broadcasting in the same area. By setting the your Base ID to a unique value, your RTK rover will only accept corrections from base stations with a matching Base ID. Base ID works with RTCM and CMR broadcast formats and accepted values are as follows:

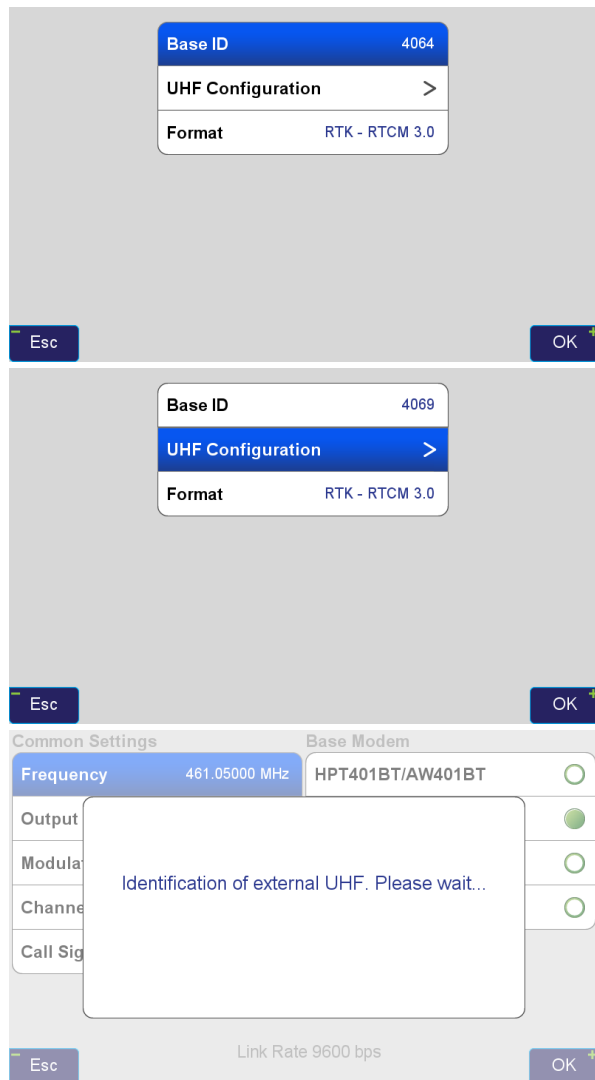
- ◆ **RTCM 3.0 - 0 to 4095**
- ◆ **RTCM 2.x - 0 to 1005**
- ◆ **CMR - 0 to 31**

To make any changes, tap on **Base ID**

Confirm the message format is appropriate

Tap **UHF Configuration** to make any changes to the radio's settings. This will trigger an immediate search for the radio via Bluetooth between the Base and the radio.

Identification of the radio may take a few seconds



Confirm that your specific radio has been selected on the right side of the screen under Base Modem. Note, that in most cases when sufficient time has been allowed for the Base to recognize and connect with the radio, the other radio selections will be grayed out.

Glance over the Common Settings and make any necessary tweaks to your communications settings including your *Output Power*.

If finished, tap **OK**.

For more information on this screen see *RTK via UHF* (p. 104)

NOTE!

Channel Bandwidth: In the United States the FCC requires the narrowband setting of 12.5 KHz

Enter your FCC License *Call Sign*

Once all settings have been entered, tap **Apply**. or
Once all unchanged settings have been confirmed, tap **OK**.

Note that the **To Base** button sends the shared data, while the **Yes, Store Point and Send to Base** button in the **Base Coordinate Confirmation** screen sends the base coordinates and HI to the base.

To send the shared communications configuration to the Base with a tap on **To Base**.

Common Settings

Frequency

461.05000 MHz

Output Power

50(17)

Modulation

DQPSK

Channel Bandwidth (KHz)

12.5

Call Sign

WQTS485

Base Modem

HPT401BT/AW401BT

☐

HPT404BT/AW400BT

☐

HPT435BT/AW435BT

☐

T-1 internal radio

☐

Esc

Link Rate 9600 bps

OK

Common Settings

Frequency

461.05000 MHz

Output Power

60(18)

Modulation

DQPSK

Channel Bandwidth (KHz)

12.5

Call Sign

WQTS485

Base Modem

HPT401BT/AW401BT

☐

HPT404BT/AW400BT

☐

HPT435BT/AW435BT

☐

T-1 internal radio

☐

Cancel

Link Rate 9600 bps

Apply

Disconnect

Start Base

Rec 30 Sec

371

Receiving

OK

UHF RTK ROVER 461.050

Base ID: 4069

Ref. Frame: NAD83(2011)

Out. Power: 40 mW

Frequency: 461.05000 MHz

Modulation: DQPSK

Bandwidth: 12.5 KHz

Format: RTK - RTCM 3.0

KILO

N 381595.2586ft

E 1824979.5208ft

H 145.3899ft

2D Delta: 1.69 ft

Antenna: JAVTRIUMPH_2A NONE

Height: 6.562 ft Vertical

Azimuth: ----

From Base

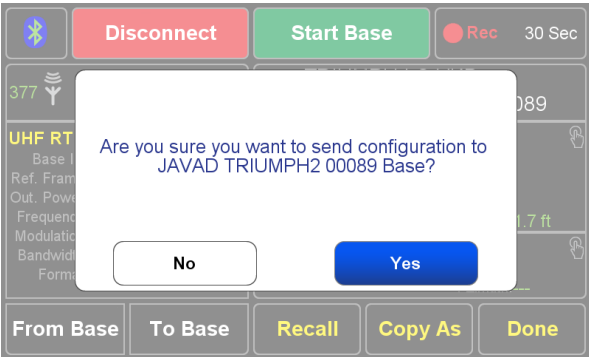
To Base

Recall

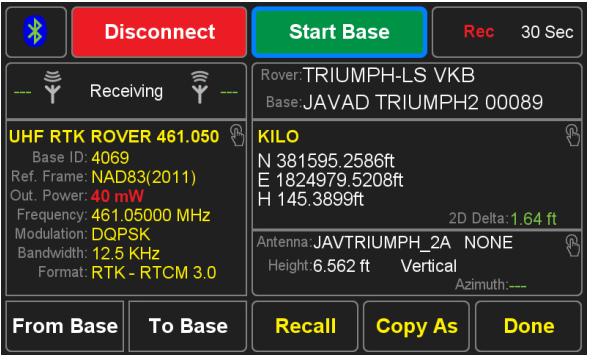
Copy As

Done

Confirm sending the configuration to the Base with a tap on **Yes**.

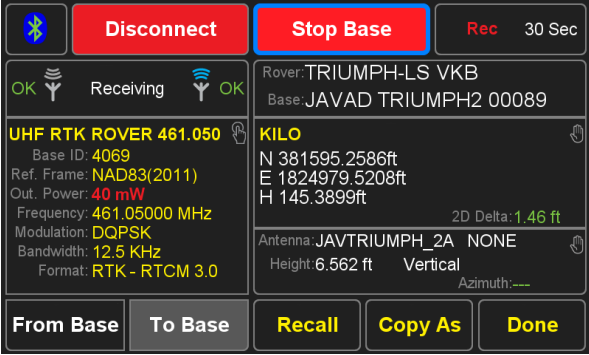


Having now defined the position of the Base, the shared communications configuration between the Base and the Rover, you are ready to tap **Start Base**.



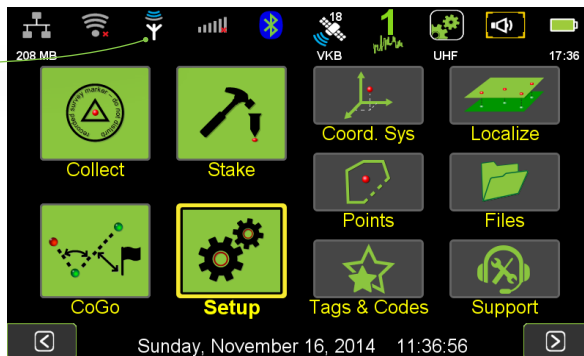
It will generally take about a minute and a half for all of the communications settings to fully implemented and working once the **Start Base** has been initiated.

That's it - you're done setting up the Base and Rover.





Press the Home button and then tap the UHF icon

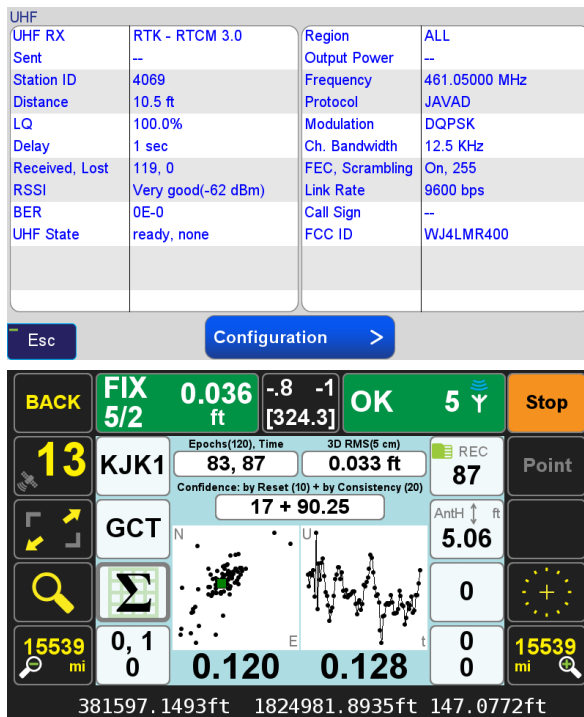


Confirm that your communications are working properly by reviewing the UHF status screen. Depending upon your swiftness in configuring the Base and Rover, values like those shown in the tabular data in the screen to the right may take several seconds to begin populating.

Distance, Delay Received-Lost and RSSI should all look reasonable for your conditions and be changing with frequent updates.

Once satisfied, tap **Esc**.

Lastly, you may wish to corroborate that the base position has been correctly entered. One way is by taking a test shot and examining the displayed statistics of the Base. Another way would be by telling *J-Field* to stake out the point you started the Base on.



Here we see displayed both the geodetic and grid coordinate values for the Base's (and Rover's) location, focusing in particularly on the Base as a check and your off and running on your next RTK surveying project!

Base	GEO	44°32'40.58287"N	068°25'01.56293"W	64.9067ft
	GRID	381595.2587ft	1824979.5208ft	145.3899ft
Rover	GEO	44°32'40.60134"N	068°25'01.52992"W	66.5936ft
	GRID	381597.1496ft	1824981.8949ft	147.0767ft

To Base

B:231°27'47"

D:3.035ft

ΔH:-1.687ft

AVG FIX: 5.1/6

Sats:5+2

UTC:2014-11-16 16:39:29

HRMS:0.025ft

VRMS:0.021ft

RMS:0.032ft

95% Conf. Ellipse

HDOP:0.866

VDOP:1.375

PDOP:1.625

oh:0.041ft

TDOP:1.084

GDOP:1.953

0:26°13'17"

σ₁:0.048ft

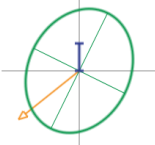
σ₂:0.038ft

ANT HGT:5.060ft

Epochs: 79s/83s

Point: KJK1

Code: DefCode



Project: Prj.2014-11-12 11... Page: GCT

