

# Trimble GPS Surveying

## TSC2 Access & R8

### IaRTN - Setting up & Surveying

#### Start a New Job

(This can be done prior to setting up the survey equipment.)

1. Turn the TSC2 controller on by pressing the green power button.
2. Press the **Trimble** button or Click *Start... Trimble Access*.
3. Click *General Survey*
4. Click on *Jobs... New Job*
5. Input the new *Job name*,
6. Set the Template as ***nrcs-gps***

Template defaults are:

Coordinate System= **15 North (UTM)**, Select coordinate system = **Select from library**,  
System = **UTM**, Zone = **15 North**, Datum = **NAD 1983 (Conus) (mol)**, Geoid Model =  
**GO9IA**, Datum Grid = **No**, Coordinates = **Grid**, Project height = **0** (Set this to an elevation  
within the project range if points without elevations are used for COGO calculations),  
Units = **International Feet**, & Cogo = **Grid**.

7. Click *Linked Files* if you want to select coordinate files that have existing points to be referenced into this project.
8. Tab down to the 2nd screen and type in the *operator name* & any other *notes*
9. Click Accept.

#### Set up GPS

10. Turn on R8. (External radio antenna is not needed.)
11. Turn on Data cell phone.
12. Turn the TSC2 controller on by pressing the green power button.
13. Click the **Trimble Access** button.
14. Click *General Survey*
15. Controller will connect to GPS unit via Bluetooth. Watch for satellites beneath the battery level on the right side of screen. See **Switching GPS Bluetooth Connections**. (Rover)

#### Conduct Topo Survey

16. Click *Measure... Iowa RTN... Measure Points*.
17. If asked select the **RTCM3 IMAX** Identifier. ., Click Enter
18. The Controller will initialize the GPS survey. Watch for **RTN:Fixed** to appear and for the Vertical precision to get down to around 0.10 ft.

19. Take Benchmark & Control Point shots:  
Input the *Point Name* for the TBM 1 (e.g. 501),  
*Code* = tbm 1

20. *Method* = **Observed control point**

21. *Antenna Height* = 2m

22. *Measured to* = **Bottom of antenna mount**

23. Set up bipod on benchmark and Click Measure

24. Once the 3 minutes of data collection has occurred click Store.

<p><b>Point Names for Survey Shots</b> Instrument Points use 1, 2, 3 ... Benchmarks use 501, 502, 503 ... Turning Points use 201, 202, 203 ...</p> <p>Topog shots – start at 1000 Continuous Topo – start at 3000</p>
---

25. Take normal topo shots:  
     Input the *Point Name* for the shot (e.g. 1000), *Code* = g
26. *Method* = **Topo Point**
27. *Antenna Height* = 2m or adjust as needed.
28. *Measured to* = **Bottom of antenna mount**
29. Click Measure
30. Once the 5 seconds of data collection has occurred click Store.
31. Press ESC when done collecting points.

#### Conduct Continuous Topo Survey

32. Click *Measure... Continuous Topo...*
33. *Method* = **Fixed Distance**
34. *Antenna Height* = adjust as needed.
35. *Measured to* = **Bottom of antenna mount**
36. *Distance* = **50** or as desired
37. *Offset* = **None**
38. Input the *Point Name* for the topo shots (e.g. 3000), *Code* = g
39. Click Start.
40. To stop continuous topo click End.
41. Press ESC when done collecting points.

#### Job & Point Information (Optional but helpful)

42. To review point coordinates, click *Jobs... Point Manager*. Press ESC when done.
43. To review GPS quality of points, click *Jobs... QC Graph*. click *Display... Vertical Precision*. and press ESC when done.
44. To review Map of job, click *Jobs... Map*. Press ESC when done.
45. To review job details in the order of work done, click *Jobs... Review Job*. Antenna Height errors can be corrected or Notes can be added here. Press ESC when done.
46. To review or change linked files, units, or coordinate system, click *Jobs... Properties of Job*. Press ESC when done.

Note: Using the Trimble Globe Key  allows the user to keep multiple items open and allows switching among tasks.

Note: Check out the Favorites button at the right side of the screen.

#### Recheck Control Points

47. Before ending the survey, **return to the control points** and take a 2<sup>nd</sup> shot on those points.  
     Compare the coordinates to the earlier results.

#### Quit out of Survey

48. When survey is completed, click *Measure... End GNSS Survey*
49. Click Yes to Disconnect Internet Connection
50. Click Yes to Power Down Receiver.
51. Click Exit. Click Yes to Shut Down General Survey.
52. Press ESC or Click X to Close Trimble Access. Click OK to confirm Access shutdown.

## Switching GPS Bluetooth Connections

### Switch GPS to Rover mode via Bluetooth

- a) Click on *Instrument... GNSS Functions... Bluetooth...*
- b) Set Connect to GNSS Base = **none**
- c) Set Connect to GNSS Rover = Your Trimble R-8 Serial Number is the ID
- d) Click  Press

### Switch GPS to Base mode via Bluetooth

- a) Click on *Instrument... GNSS Functions... Bluetooth...*
- b) Set Connect to GNSS Rover = **none**
- c) Set Connect to GNSS base = Your Trimble R-8 Serial Number is the ID
- d) Click  Press

### Check to see that Bluetooth is turned on

- a) Click on *Instrument... GNSS Functions... Bluetooth...*
- b) Click *Config*
- c) Checkmark *Turn on Bluetooth*
- d) Click  Press

## GPS R8 Control Point Surveying for OPUS

Option A: If being used when no IaRTN data cell phone coverage is available, begin by using steps 1 through 14 but skipping step 11.

### Collect GPS base station Survey

53. Switch GPS to Base Mode. See **Switching GPS Bluetooth Connections**.
54. Click on *Measure... RTK... Start Base Receiver...*
55. **Right Arrow** for the *Point Name* to **Key In**
56. Press the  button to populate the coordinates.
57. Input a *Point Name* and *Code*
58. Click
59. *Input antenna height = 2.0m*
60. *Measured to:* = **Bottom of antenna mount**
61. Click
62. Base Started, Click
63. To verify that the data is being collected, click *Instrument... Receiver files... Import from Receiver*. You'll see a padlocked file if it is working correctly. Press .
64. Let Base collect data for a **minimum** of 20 minutes for OPUS-RS. 2 hours for OPUS.
65. When completed you can click *Measure... RTK... End GNSS Survey...*
66. Power Down Receiver? Click .

Option B: If being used to compare OPUS results to IaRTN, begin by using steps 1 through 23 in the IaRTN Setting up & Surveying section.

#### Collect GPS base station Survey

67. Switch GPS to Base Mode. See **Switching GPS Bluetooth Connections**.
68. Click on *Measure... RTK... Start Base Receiver...*
69. Input the *Point Name* collected via the IaRTN
70. Press Tab
71. *Input antenna height = 2.0m*
72. *Measured to: = Bottom of antenna mount*
73. Click Start
74. Base Started, Click Ok
75. To verify that the data is being collected, click *Instrument... Receiver files... Import from Receiver*. You'll see a padlocked file if it is working correctly. Press ESC.
76. Let Base collect data for a **minimum** of 20 minutes for OPUS-RS. 2 hours for OPUS.
77. When completed you can click *Measure... RTK... End GNSS Survey...*
78. Power Down Receiver? Click No.

#### Transferring receiver files for OPUS (Option A & B)

79. Click on *Instrument... Receiver files... Import from receiver*
80. Find to the receiver files that you want to transfer and click to the left of the Name to checkmark the file. [Files are named with the first 4 digits based on the last 4 digits of the receiver serial number, the next 3 digits are the calendar day of the year (e.g. Feb 20 = day 051, and the last digit is the order of receiver files collected that day (starting with 0 as the 1<sup>st</sup> file). E.g. 80110720 would be from the 8011 receiver, on day 072 of the year, and the first log file of the day.)]
81. Click Import. Click Start.
82. Once files are successfully transferred Click Ok. Click ESC
83. Switch GPS back to Rover Mode. See **Switching GPS Bluetooth Connections**.
84. You can now download the .T01 files from TSC2 to your computer using an Active Sync connection and Explorer.

## TSC2 Special keys

Func + Power to turn TSC2 backlight on/off

Func + Trimble Globe  to disable or enable touch screen

#### Soft reset

Hold Power for ~3 secs, Then menu appears:



Reset: Restarts a running program that is locked up.

Unsaved files will be lost.

Shutdown: Closes all running applications and powers down to lowest power mode.