ORIGIN FIELD SOFTWARE TUTORIALS

RTK Radio Survey Setup

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About this Tutorial

In this tutorial, you will learn how to set up a Radio RTK Survey, connect to a rover, and connect to a base station.

This tutorial will take about 10-20 minutes to complete.

Radio RTK Survey Style

In Origin, to connect to a GNSS receiver, you need to define a survey style. A survey style defines the model of GNSS receiver you are going to use and the way you are going to use it.

What You Will Need

- **Origin Field Software:** Origin Max or Origin GNSS
- **Device**:
  - Computer or data collector
  - GNSS Receiver - this tutorial uses Spectra's SP60 GNSS Receiver
  - Base Station
  - Radio
- **Geoid**: You will need to have a geoid for this tutorial. This tutorial was made using the *GEOID18 (Conus) (g18us.ggf)* geoid file. Please use the geoid that matches your area. Here is a link to various geoid files. Once you have the geoid file downloaded, the file needs to be moved into the system files folder in the Origin application. Please use the following steps:
  1. Download and copy Geoid file to data collector
  2. Open the Spectra Geospatial Origin folder (or Spectra Geospatial Emulator for a desktop)
  3. Open Spectra Geospatial Data folder
  4. Open System Files folder and paste geoid file

Step 1: Create a Project and Job

Note: If you have a project folder in Trimble Connect, open the project and create a new job.

1. In Origin, you will be brought to the **Projects** page. Tap **New** in the top left hand corner of the screen.

    The **New project** screen will display.

2. In the **New [project** screen, fill in the project details (not all of the details are required).

    Name the project "*RTK Radio Survey* "

    (Optional) Provide a **Description** *"starting a RTK Radio Survey"*

    (Optional) Provide a **Reference**

    (Optional) Include a **Location** *"Westminster, CO"*

    (Optional) Include an **Image**

3. Tap **Enter** and **Create**

4. In the **New job: RTK VRS Network Survey/** screen, use **Create from template** and set up the job with these details:

    Job name - *"Starting a RTK Radio Survey"*

    Template - *Metric Scale Only*

    Tap **Coord. Sys.**

    > Tap **Select from library**
    >
    > **System** - *United States/State Plane 1983*
    >
    > **Zone** - *Colorado North 0501*
    >
    > **Geoid** - *Yes*
    >
    > **Geoid model** - *GEOID18 (Conus) (g18us.ggf)* - refer to steps for implementing the geoid file into the Origin System Files on your device.

Project height - *1524m*; **Tip:** If you know the project height in US Feet, type height XX sft, and it will automatically adjust to meters.

Units (Dist.) - *Meters*

Feature library - *GlobalFeatures*

Leave all of the other properties to the default (or empty) value.

5. Tap **Accept**.

6. Once you have opened the project, you are brought to the **Map** screen.

Step 2: Create a Survey Style

This tutorial uses an SP60, fill in the information with the instrument you are specifically using.

1. Tap ☰ .

2. Scroll down to **Settings** and tap **Survey styles.**

   In the **Survey styles** screen, you will see a list of previously used survey styles and the date it was last modified.

3. At the bottom of the screen, tap **New** to create a new survey style.

   The **Style details** screen will appear and there is a location to provide a **Style name** and **Style type**.

4. Change the **Style name** to *RTK Base* and the **Style type** to **GNSS**

   Tap **Enter** and **Accept**

5. The **RTK Base** page will appear, where you can configure settings for the survey style.

6. Tap **Rover options** and change the following settings (change to fit your device):

   Survey type to **RTK**

   Broadcast format to **CMRx** or the broadcast format for your radio .

   Under **Antenna** settings,

   > Change the antenna **Type** to your rover

   > Choose your preferred **Measured to** preference

   > Input **Antenna height**

   > **Note:** Only enter an antenna height if you want to set a default when starting a survey.

   Under **GNSS Signal Tracking**, check the satellites available for your area. This tutorial uses: **GPS, GPS L2C, GLONASS** and **Galileo**.

7. Tap **Accept** and you will be brought back to the **RTK Base** screen.

8. Tap **Rover data link.** This will define the way corrections to the rover are received.

   Change **Type** to **Radio** and change **Radio** to **Receiver internal.**

9. Tap **Connect** to connect to your rover and change the radio frequency.

   A pop-up will appear saying *Connecting to GNSS rover via cable - Bluetooth: None*.

   Tap **Settings** in the pop-up window and you will be brought to the **Connections** tab.

10. On the **Connections** page, ensure you are under the **Bluetooth** tab to connect to your rover and base station.

11. To connect to a new rover, tap **Search** at the bottom of the screen

Note: if you have already connected to this rover before, just select your rover from the drop down menu under Connect to GNSS Rover.

12. On the Bluetooth Search screen, there are two columns showing a list of **Discovered Devices** and **Paired devices**.

   Under **Discoverable devices**, tap the rover you would like to connect to.

   Tap **Pair**.

13. A pop-up will appear saying **A new device has been paired.** Ensure the **Device name** is correct and **Device type** is **Connect to GNSS rover**.

   Tap **Accept**.

14. You will be brought back to the **Rover data link** screen.

   Tap **Connect** and the **Connecting to radio ….** pop-up will appear and load to **100%**.

15. Origin will prompt you to the **Radio configuration** screen where you can check and change the radio frequency.

   The settings for this page will depend on the radio that you will be using. This survey uses **TRIMTALK v1 at 9600 bps** at a frequency of **469.55 MHz**.

16. Once the settings are set up for your radio, tap **Accept** and a **Setting radio…** pop-up will appear and load to 100%.

17. You will be brought back to the **Rover data link** page and tap **Accept**.

18. Back on the **RTK Base** survey style screen, tap **Base options**.

19. Change the **Survey type** to **RTK** and **Broadcast format** to **CMRx**.

   Under **Antenna**, change the settings to git your antenna:

   > Type: **SP60**

   > Measured to: **Bottom of antenna height**

   > Antenna height: **2.0m**

   Tap **Accept**.

20. Tap **Base data link** on the **RTK Base** survey page.

   Type to **Radio**

Step 2. Create a Survey Style

Under **Radio,** select the radio you will be using and fill in the settings for your radio.

Tap **Accept**

21. Now that the rover and base station is defined, tap **Store**.

Step 3: Start the Survey

1. Tap ≡ .

2. Tap **Measure,** then **Radio RTK,** then **Measure points**

3. Two pop-ups will appear: **Connection to GNSS rover via bluetooth - Bluetooth: SP60_XXXXXX** (your device) and **Starting survey …** that will load to 100%.

4. The map screen will appear again with the **Measure points** tab open on the left.

5. One you have an **RTK Fixed** solution, an **Initialization Change** pop-up will appear saying **Initialization has been gained.**

   Tap **OK.**

6. You are now ready to begin your survey.

You have completed this tutorial.