

Leica SurvCE Training



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1.0 Introduction

Objectives In this exercise you will learn how to configure a reference station using Leica SurvCE and a GX1230 GPS.

GPS measured points are always stored based on the global geocentric datum known as WGS 1984. Most surveys require coordinates in a local grid system, for example, based on a country's official mapping datum or an arbitrary grid system used in a particular area such as a construction site. To convert the WGS 1984 coordinates into local coordinates, a coordinate system is required. Part of the coordinate system is the transformation used to convert coordinates from the WGS 1984 datum to the local datum.

We do this inside the **Localization** function.

At the end of the exercise you should be able to perform the following on Leica SurvCE:

- Establish communication between Leica SurvCE and a GX1230 GPS.
- Setup a GPS base station over a point and create a Reference file in Leica SurvCE.
- Create a Localization file in Leica SurvCE.

Tasks to complete

We need to set up the GX1230 over one of our control points and create a reference file and a localization file.

2.0 Setting up the GX1230(GG) Base Station

Objective

The course instructors will advise each student which control point to occupy with the GPS for the field exercise. **Assign equipment and radio channel to students.** Set up the GX1230 sensor on a tripod over the point. Using a **GEV163** cable connect the RX1250 to the GX1230 and power on the GX1230 sensor. The antenna height must be measured with a height hook. Communication will be established using an Intuicom 1200 DL radio with each receiver. The radio should be connected to port 3 of the GX1230 and will send corrections in a Leica proprietary format.

Note that we will be configuring the job in US Feet and measuring the distance to the ARP in Meters. Leica SurvCE will convert distances at input by simply appending the unit designator to the measurement.



SmartWorx opens automatically at startup. Press the **SHIFT** key on the keyboard of the RX1250 and select **F6 EXIT** to exit SmartWorx.

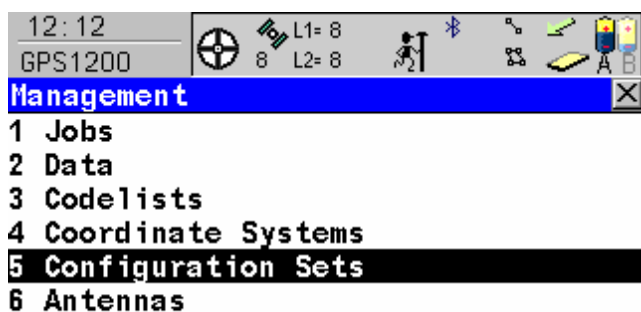


On the WinCE desktop double

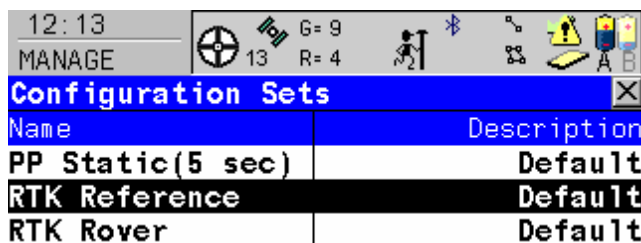
tap the  icon.



Select **3 Manage**



Select **5 Configuration Sets**

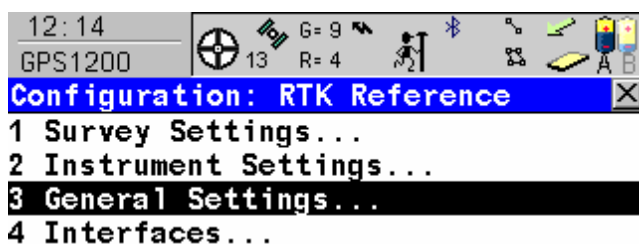


Select **RTK Reference**

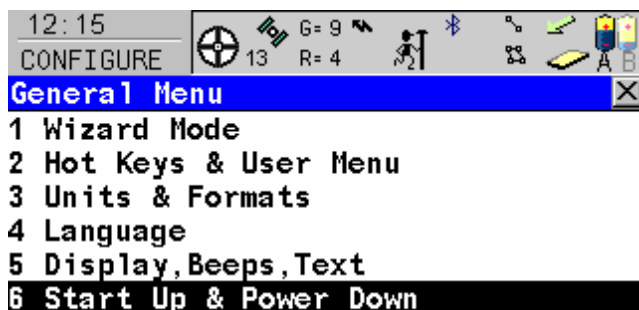
Press **F1 CONT**



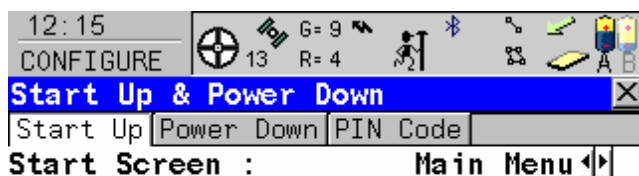
Select **5 Config**



Select **3 General Settings**

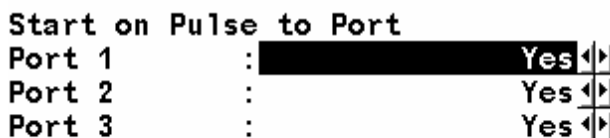


Select **6 Start Up & Power Down**



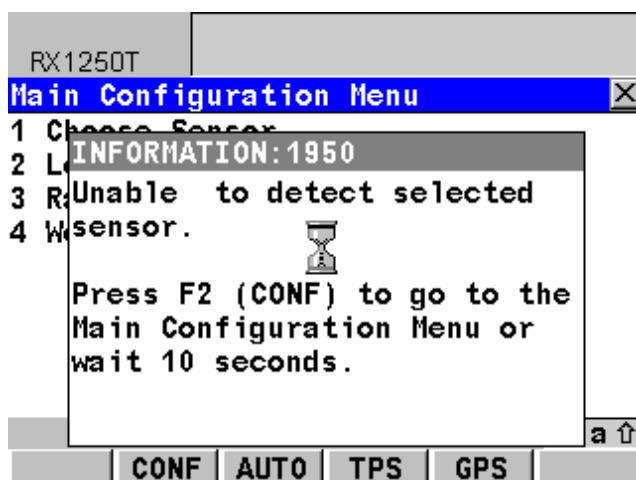
On the **Start UP** tab change
Start on Pulse to Port:

- Yes Port 1
- Yes Port 2
- Yes Port 3



Press **F1 CONT**

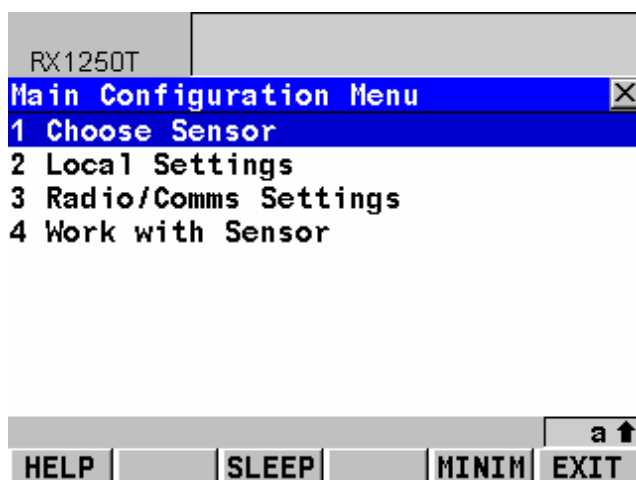




Disconnect the **GEV163** cable from the **RX1250**.

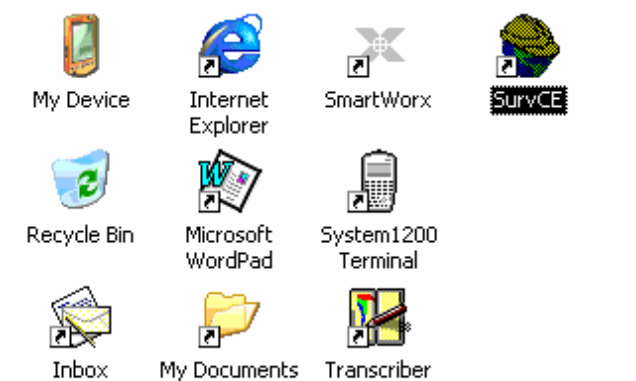
Wait several seconds for this screen to appear.

Press **F2 CONF** or wait 10 more seconds.



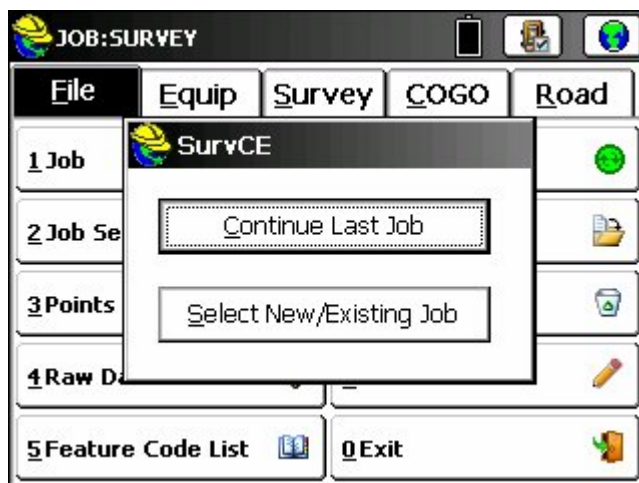
Press the **SHIFT** key on the RX1250 keyboard.

Select **F6 EXIT**



Double tap the **SurvCE** icon on the WinCE desktop.

Select Job

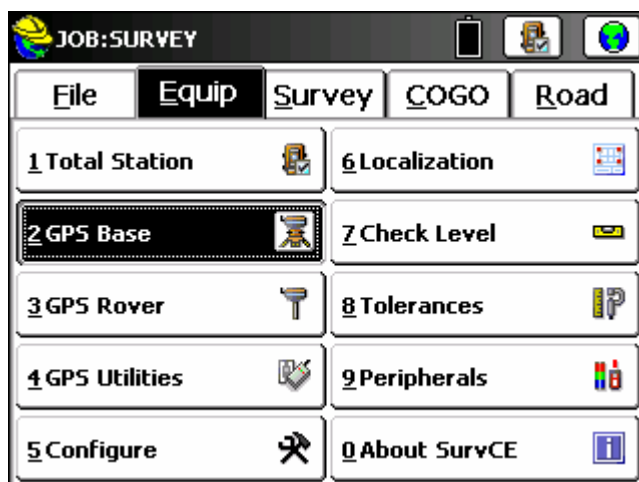


SurvCE offers the option to reload the last job used at start-up.

The name of the job is displayed in the Title Bar.

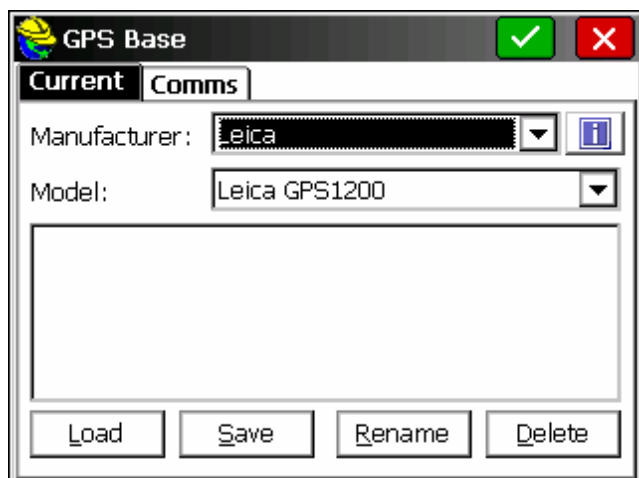
Let's return to the job we created in Exercise 11

Select the Equipment



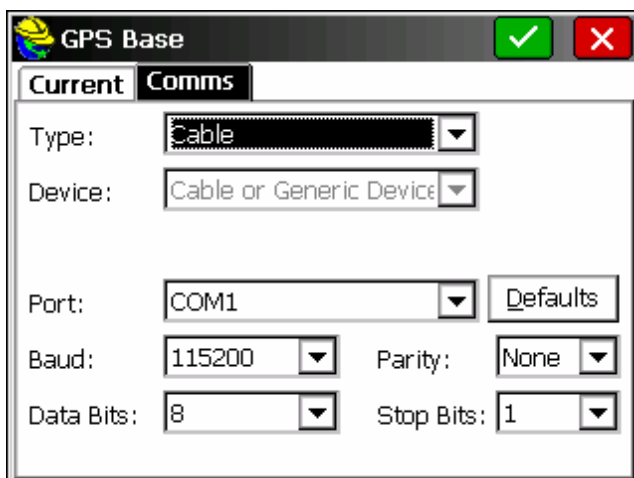
From the **Equip** menu let's tap the **GPS Base** button or press **2** on the RX1250 keyboard.

When connecting to a GPS receiver SmartWorx will automatically start and flash briefly on the screen.



On the **Current** tab let's choose:

- **Leica** Manufacturer
- **Leica GPS1200** Model



GPS Base [Green Checkmark] [Red X]

Current **Comms**

Type: Cable

Device: Cable or Generic Device

Port: COM1 Defaults

Baud: 115200 Parity: None

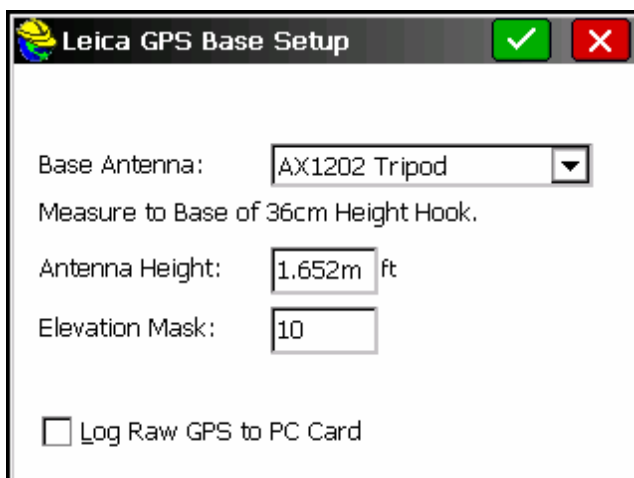
Data Bits: 8 Stop Bits: 1

On the **Comms** tab choose:

- **Cable** Type
- **COM1** Port
- **115200** Baud
- **None** Parity
- **8** Data Bits
- **1** Stop Bits

Device will be grayed out.

Tap the [Green Checkmark] on the screen to accept the configuration.



Leica GPS Base Setup [Green Checkmark] [Red X]

Base Antenna: AX1202 Tripod

Measure to Base of 36cm Height Hook.

Antenna Height: 1.652m ft

Elevation Mask: 10

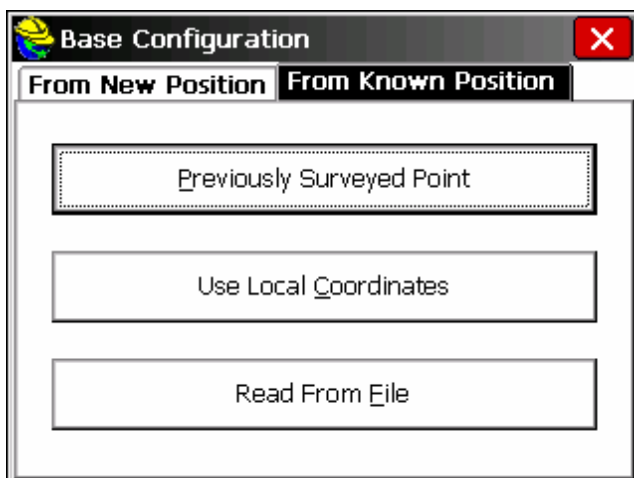
☐ Log Raw GPS to PC Card

Selecting AX1202 Tripod assumes the use of a height hook to measure the antenna height and will apply the proper 36cm offset, resulting in a valid measurement to the ARP.

Apply the following:

- **AX1202 Tripod** Base Antenna
- **X.xxxm** Antenna Height
- **10** Elevation Mask

Tap the [Green Checkmark] on the screen to accept the configuration.



Base Configuration [Red X]

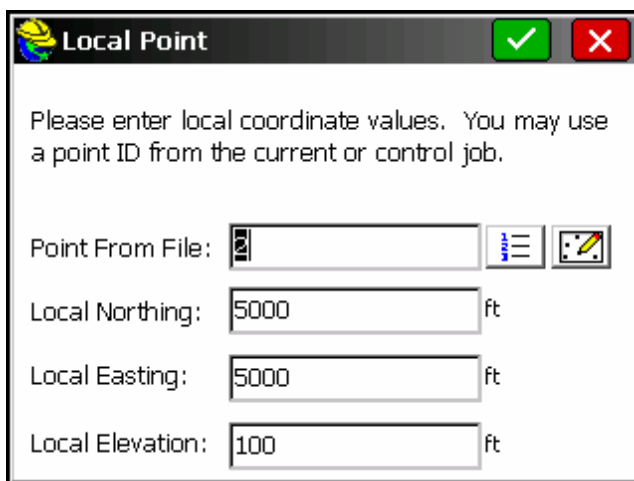
From New Position **From Known Position**

Previously Surveyed Point

Use Local Coordinates

Read From File

Because we are setting up our base station on a point already stored within our coordinate file we will choose **Use Local Coordinates** from the **From Known Position** tab.



Local Point

Please enter local coordinate values. You may use a point ID from the current or control job.

Point From File:  

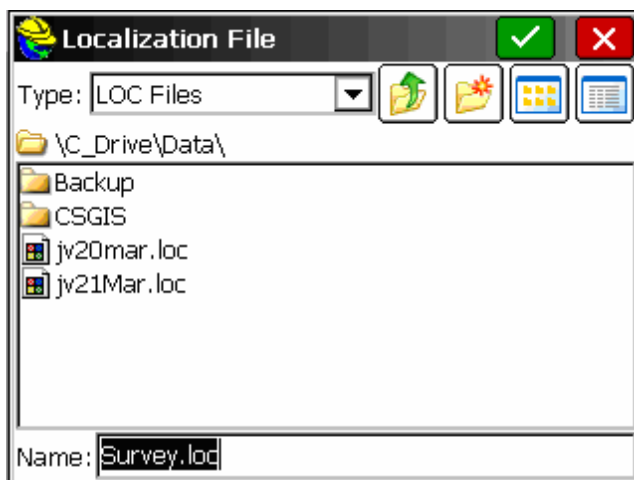
Local Northing: ft

Local Easting: ft

Local Elevation: ft

There are three ways to select the point from our file. We can tap the  icon to select the point from a list, tap the  icon to select the point graphically, or simply enter the point number in the **Point From File** box. Choose the point number from your file for the point over which you have set the base station.

Tap the  on the screen to accept the point.



Localization File

Type:    

\C_Drive\Data\

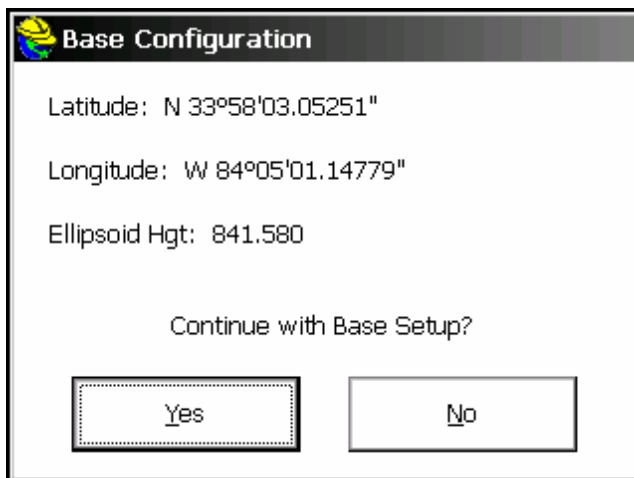
- Backup
- CSGIS
- jv20mar.loc
- jv21Mar.loc

Name:

Because we have chosen to **Use Local Coordinates** on the **Base Configuration** screen a localization file is automatically created for this job. This will automatically add the base point to the list of points in the localization file.

Name the file **Survey.loc**

Press the  key on the RX1250 or tap the  on the screen to accept the name.



Base Configuration

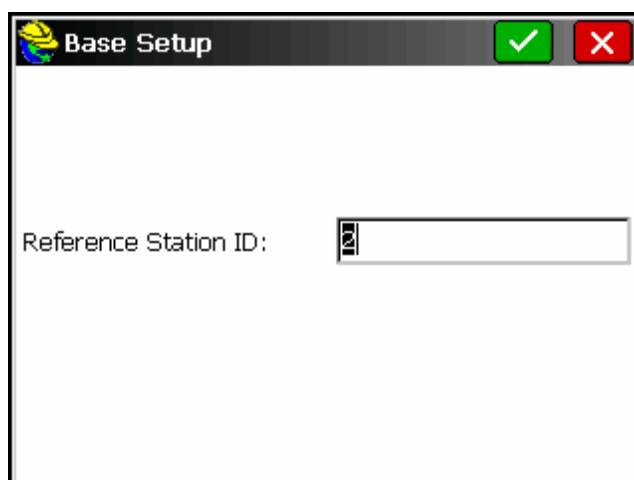
Latitude: N 33°58'03.05251"

Longitude: W 84°05'01.14779"

Ellipsoid Hgt: 841.580

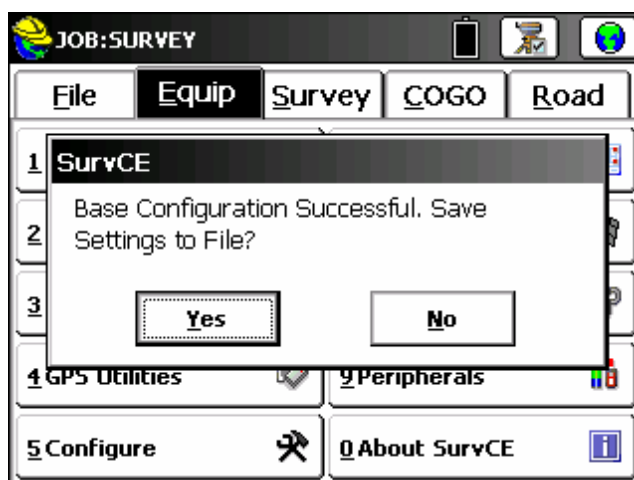
Continue with Base Setup?

The WGS84 position read by the receiver will be displayed. Tap **YES** to continue.



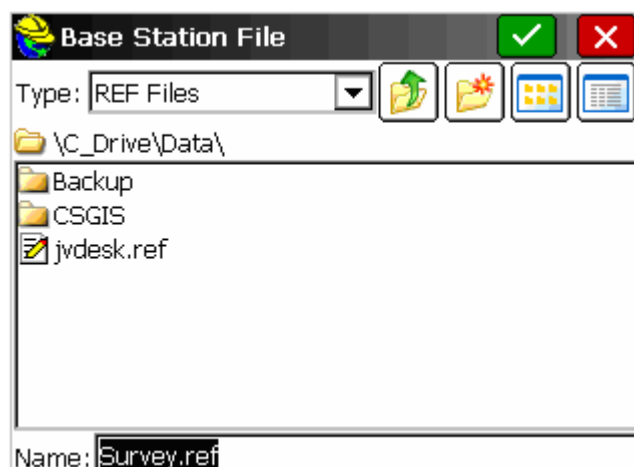
Remove the entry in the **Reference Station ID** box and leave it blank.

Press the  key on the RX1250 or tap the  on the screen to continue.



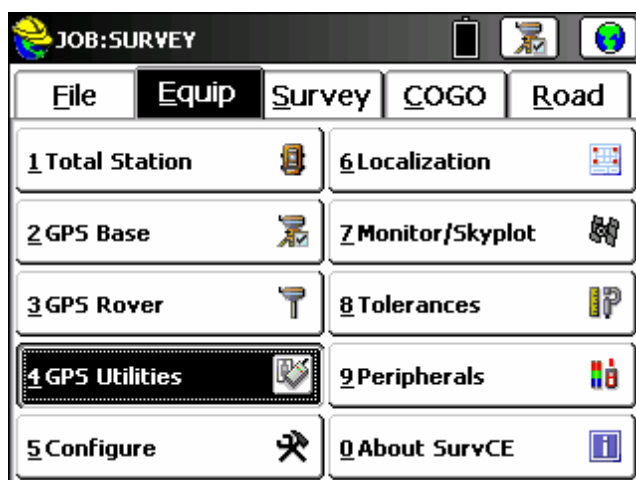
SurvCE optionally creates a base station reference file that can be reused. By creating this file we will have the option of reusing this point as a GPS reference point without having to re-localize.

Tap **YES** to save this file and continue.

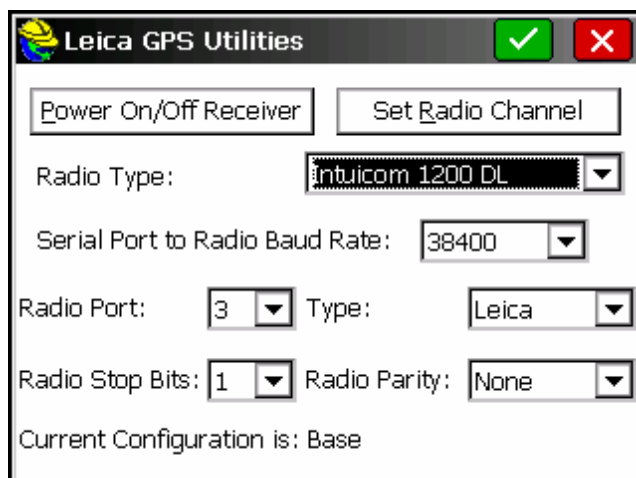


Name the file **Survey.ref**.

Press the  key on the RX1250 or tap the  on the screen to accept the name.



Tap **GPS Utilities** or press **4** on the **Equip** menu tab.



Configure the following:

- **Intuicom 1200 DL** Radio Type
- **38400** Serial Port to Radio Baud Rate
- **3** Radio Port
- **Leica** Type
- **1** Radio Stop Bits
- **None** Radio Parity

Tap the **Set Radio Channel** button.

Configuration of radio as a Base Radio

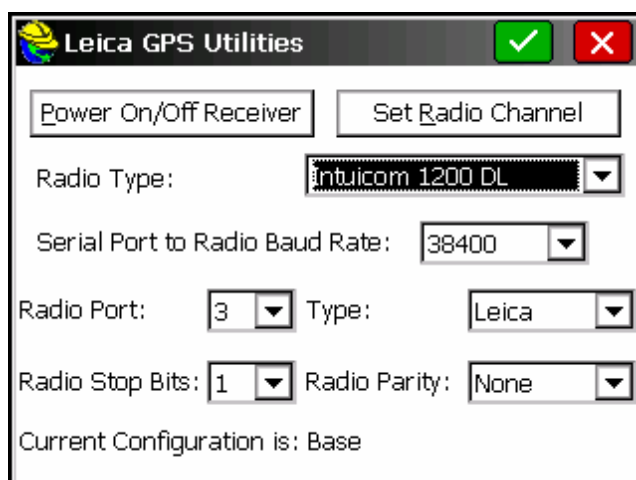


Intuicom radio's can be configured to transmit or receive. Configuration changes are made through changes to the channel setting.

Set the channel to 14 to configure the unit as a transmitter.

Tap the **Set Radio Button**.

You will be returned to the previous screen. Tap the **Set Radio Channel** button again and **select the channel assigned to you by your instructor**. Tap the **Set Radio** button.



Leica GPS Utilities

Power On/Off Receiver Set Radio Channel

Radio Type: **Intuicom 1200 DL**

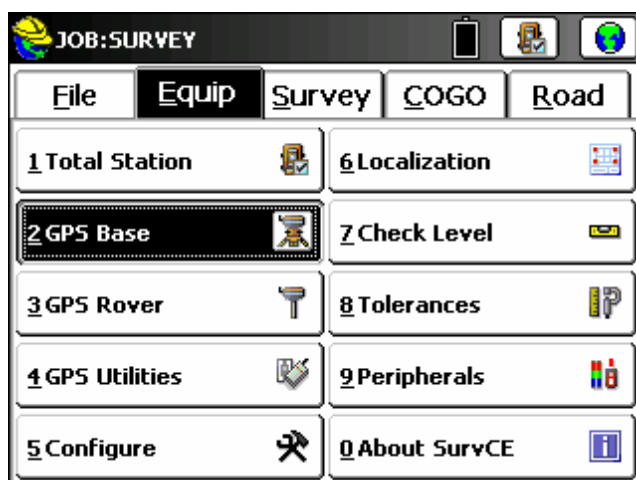
Serial Port to Radio Baud Rate: **38400**

Radio Port: **3** Type: **Leica**

Radio Stop Bits: **1** Radio Parity: **None**

Current Configuration is: Base

Tap the  on the screen to accept the configuration.

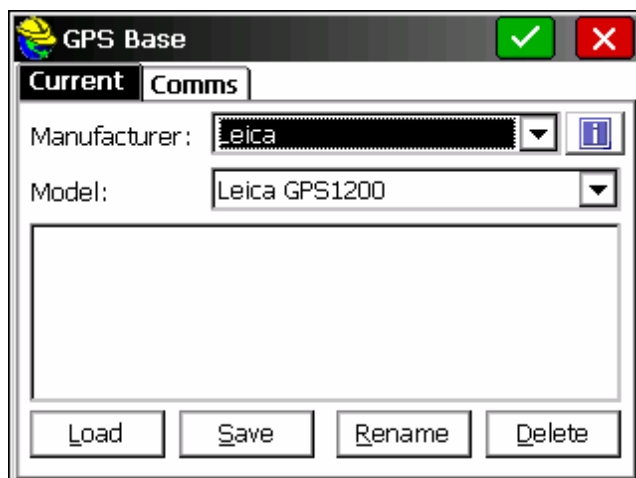


JOB: SURVEY

File **Equip** Survey COGO Road

1 Total Station	6 Localization
2 GPS Base	7 Check Level
3 GPS Rover	8 Tolerances
4 GPS Utilities	9 Peripherals
5 Configure	0 About SurvCE

To save the configuration that we have just created we need to return to the **Equip** menu tab and tap the **GPS Base** button



GPS Base

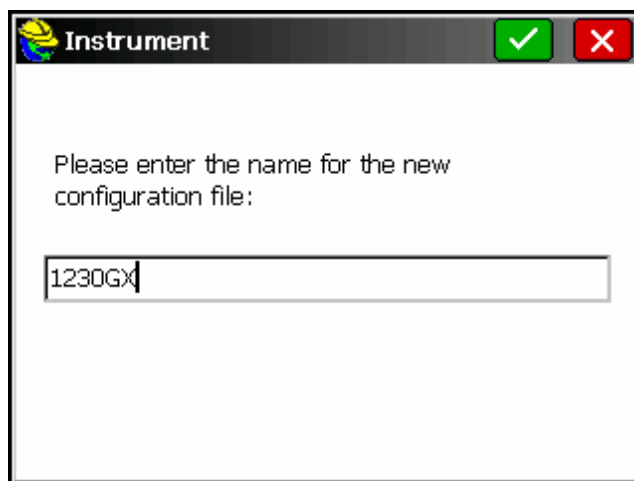
Current Comms

Manufacturer: **leica**

Model: **Leica GPS1200**

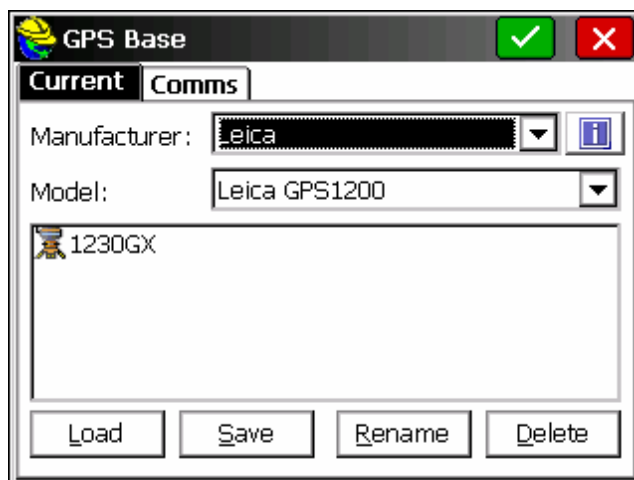
Load Save Rename Delete

Tap the **Save** button.



Name the configuration **1230GX**.

Press the  key on the RX1250 or tap the  on the screen to accept the name.



Tap the  on the screen to close the window.

The Base Station is configured and the configuration has been saved.