Using the GeoExplorer 3 Operation Guide

Click 

to view the Contents of the GeoExplorer 3 Operation Guide.

Click 

to hide the Contents of the GeoExplorer 3 Operation Guide.

Click 

PgUp to go up a page, Fwd to go forwards after retracing your steps, PgDn to go down a page, and Back to retrace your steps.

Click 

to go to the first page of the Index in the documentation.

Click 

to print a page of the GeoExplorer 3 Operation Guide.

Click 

to return to Using the GeoExplorer 3 Operation Guide (this page).

Click 

to close the documentation.

More...	indicates more information about the current topic. Click the PgDn button at the bottom of the screen to move to the remaining information.	
green text	indicates a link to a related topic.	**To follow a link:** Position the pointer over green or red text. It changes to 
red text	indicates a link to the glossary	Click the mouse to go to the page containing the highlighted topic.

Fonts

`This font and color` represents information that you type in a software screen or window.

DATA is an example of a hardware key that you press on the GeoExplorer 3 keypad.

`This font and color` represents messages displayed on the GeoExplorer 3 screen.

Warnings, Cautions, Notes, and Tips

Warnings, cautions, notes, and tips draw attention to important information and indicate its nature and purpose.

WARNING Warnings alert you to situations that could cause personal injury or unrecoverable data loss.

CAUTION Cautions alert you to situations that could cause hardware damage or software error.

NOTE Notes give additional significant information about the subject to increase your knowledge or guide your actions.

TIP Tips indicate a shortcut or other time- or labor-saving hint that can help you make better use of the product.

SYSTEM OVERVIEW

This System overview provides general information about the GeoExplorer 3 data collection system, its components, and accessories. System overview is divided into two sections. Introduction explains how to use the GeoExplorer 3 and provides an overview of what you can do with it. Components and Accessories explains the parts and software that you use with the GeoExplorer 3 data collection system.

- **Introduction**
- **Components and accessories**

Introduction

This section introduces you to the GeoExplorer 3 data collection system. The topics covered include:

- **What is the GeoExplorer 3 data collection system?**
- **What can you do with the GeoExplorer 3 data collection system?**
- **GeoExplorer 3c edition**
- **Using the GeoExplorer 3 data collection system**

What is the GeoExplorer 3 data collection system?

The GeoExplorer 3 data collection system is an integrated GPS receiver and datalogger for mapping, relocating, and updating GIS and spatial data. It can be used with a real-time source of differential corrections such as Trimble's Beacon-on-a-Belt™. It also works with the GPS Pathfinder® Office software for mission planning, data transfer, data dictionary creation, data import/export, and postprocessing.

You can operate the GeoExplorer 3 data collection system as a **rover** receiver or as a **base station**. You can also collect high-precision data using GPS carrier phase measurements. Using the intuitive user interface you can navigate, collect data, view system status and satellite availability, and control the GPS receiver.

The GeoExplorer 3 datalogger is designed for handheld use in the field. It has an internal antenna and power source, and a high-performance 12-channel GPS receiver. An external antenna is available as an optional accessory when using the GeoExplorer 3 inside a vehicle.

What can you do with the GeoExplorer 3 data collection system?

The primary functions of the GeoExplorer 3 data collection system are collecting geographic data, using and updating existing GIS data, and navigating in the field.

Use the GeoExplorer 3 to accurately and efficiently collect the attributes and GPS position of geographic points, lines, and areas. This information is stored in one or more data files that you can transfer to Trimble's Pathfinder Office software for **postprocessing** and editing. Data can then be exported into a wide range of GIS-compatible formats.

Use the GeoExplorer 3 to update data from an existing GIS or CAD database. You can also review, edit, and update the GPS positions and attributes for features.

Use one of three methods of navigation—a road view, compass, or chart—to navigate to specific locations. You can use **real-time differential GPS** to optimize navigation and provide in-field differential accuracy.

It is easy to create or edit data dictionaries and setup configurations in the office with the Pathfinder Office software. Alternatively, use the GeoExplorer 3 data collection system to create or edit data dictionaries.

The GeoExplorer 3 data collection system provides two maps for use in the field:

- use Chart to create waypoints and to navigate to features and waypoints
- the Map to view and update features

For greater precision, use real-time DGPS to differentially correct positions as you collect data in the field. The GeoExplorer 3 data collection system is compatible with the Beacon-on-a-Belt (BoB) receiver to provide real-time DGPS, as well as other DGPS providers. To compute positions with even greater accuracy using the Pathfinder Office software, collect carrier phase data for points, lines, and areas.

You can operate the GeoExplorer 3 data collection system as a temporary GPS base station in situations where it is impossible or impractical to set up a permanent base station.

Applications for the GeoExplorer 3 include forestry mapping, environmental and resource management, disaster assessment, utility inventories, and urban asset management. For example, a power company could build an asset register of all its power poles, record their positions, their condition and structure, and any attached hardware. A maintenance crew can then use the GeoExplorer 3 navigation functions to locate poles that need repair.

GeoExplorer 3c edition

This manual describes the GeoExplorer 3 data collection system.

If you have purchased the GeoExplorer 3c data collection system edition, the following functionality is not available with your system:

- Map or Chart tabs
- Cable-free communication with the BoB receiver
- Trimble .SSF data file upload
- Uploaded coordinate systems from Pathfinder Office

You can upgrade your GeoExplorer 3c edition to the full GeoExplorer 3 data collection system. To do this, contact your local Trimble dealer.

Using the GeoExplorer 3 data collection system

The GeoExplorer 3 software is arranged in three ‘sections’. They are:

- **THE SYS SECTION**
- **THE DATA SECTION**
- **THE NAV SECTION**

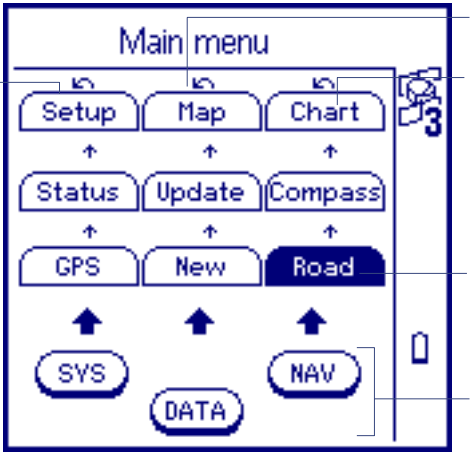
To move to a section press the corresponding section key on the GeoExplorer 3 handheld. For example, if you are currently in the SYS section and you want to go to the DATA section, press DATA.

Each section contains three tabs. These appear at the top of the screen. To move between tabs press the corresponding section key: SYS, DATA, or NAV. Each time you press the same key, you move to another tab in that section. For example, to move between the three different tabs in the SYS section, press SYS three times. As you move between the SYS tabs (GPS, Status, Setup), the current tab moves to the front. Alternatively, you can use the **Main menu** to move between sections and tabs.

This diagram shows the location of the keys on the GeoExplorer 3 data collector.

Main menu

Use the Main menu to view all sections and their corresponding tabs. To display the Main menu press Fn OPTION.



Use the arrow keys to move around the Main menu.The tab currently active is the larger, highlighted tab. Press ENTER to close the Main menu and go to the current tab.

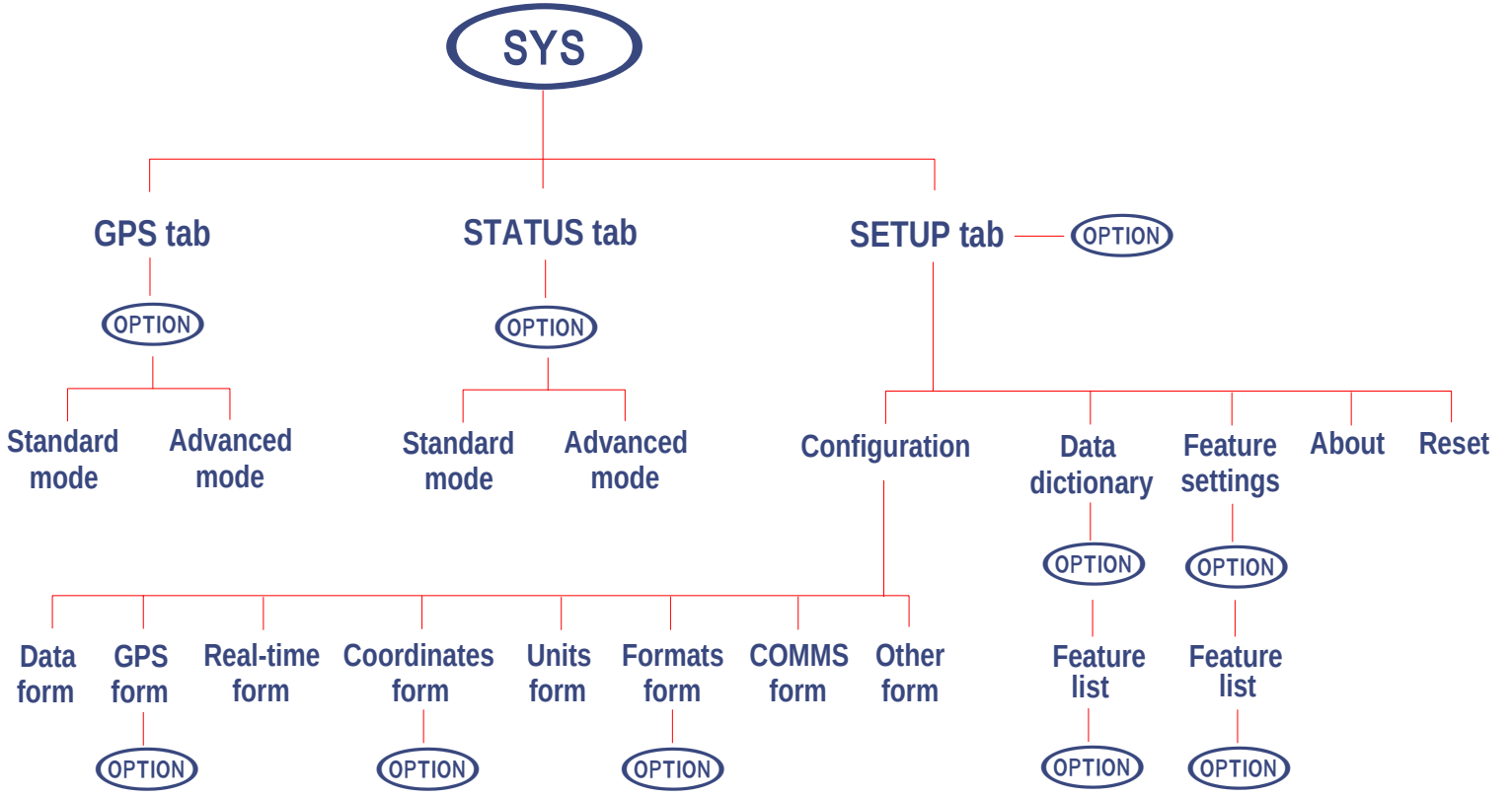
For example, to use the Main menu to move from the Chart tab to the Status tab, highlight the Status tab and then press ENTER.

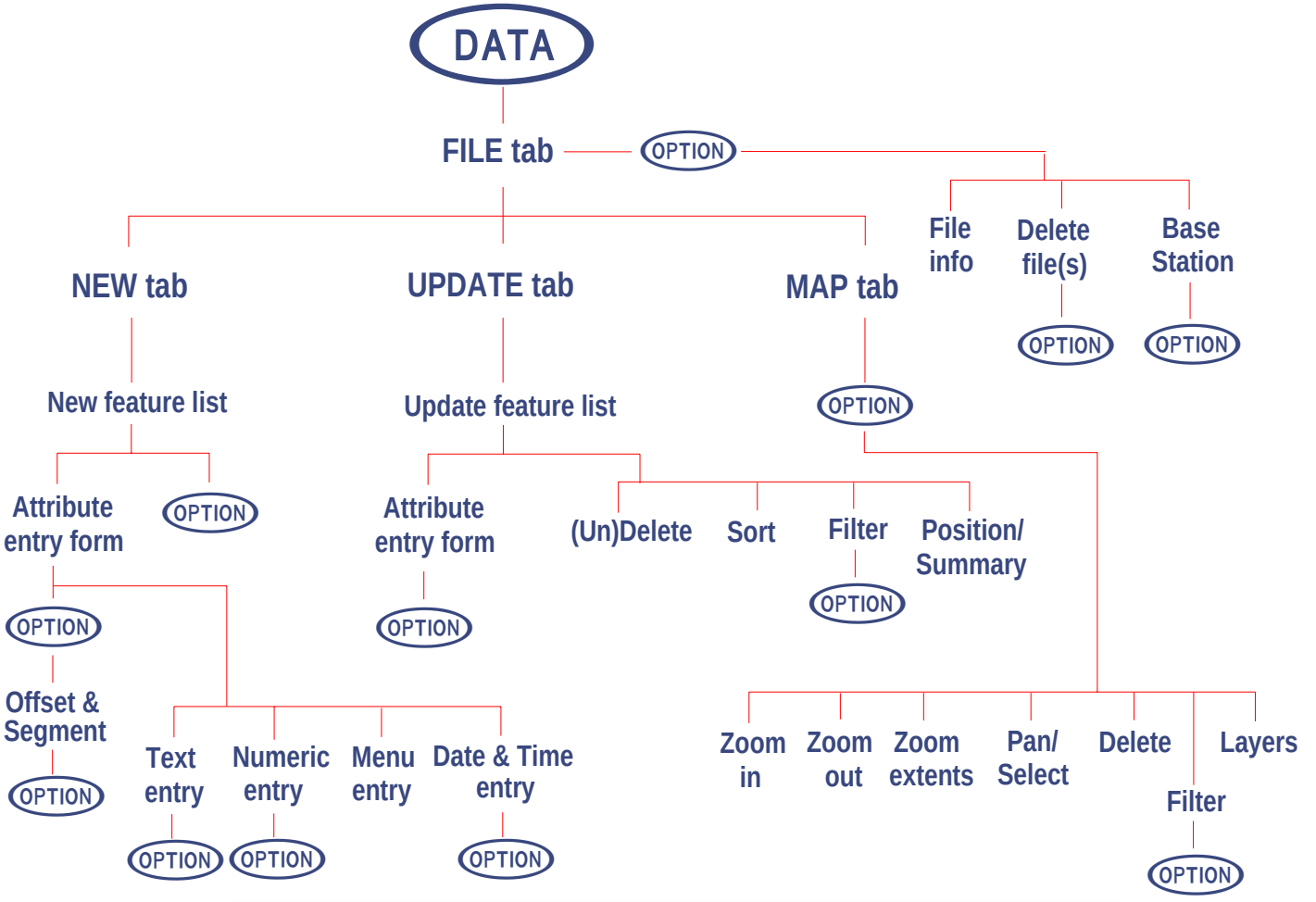
NOTE When no data file is open, the only tab available in the DATA section is the File tab. When a data file is open the New, Update, and Map tabs are available.

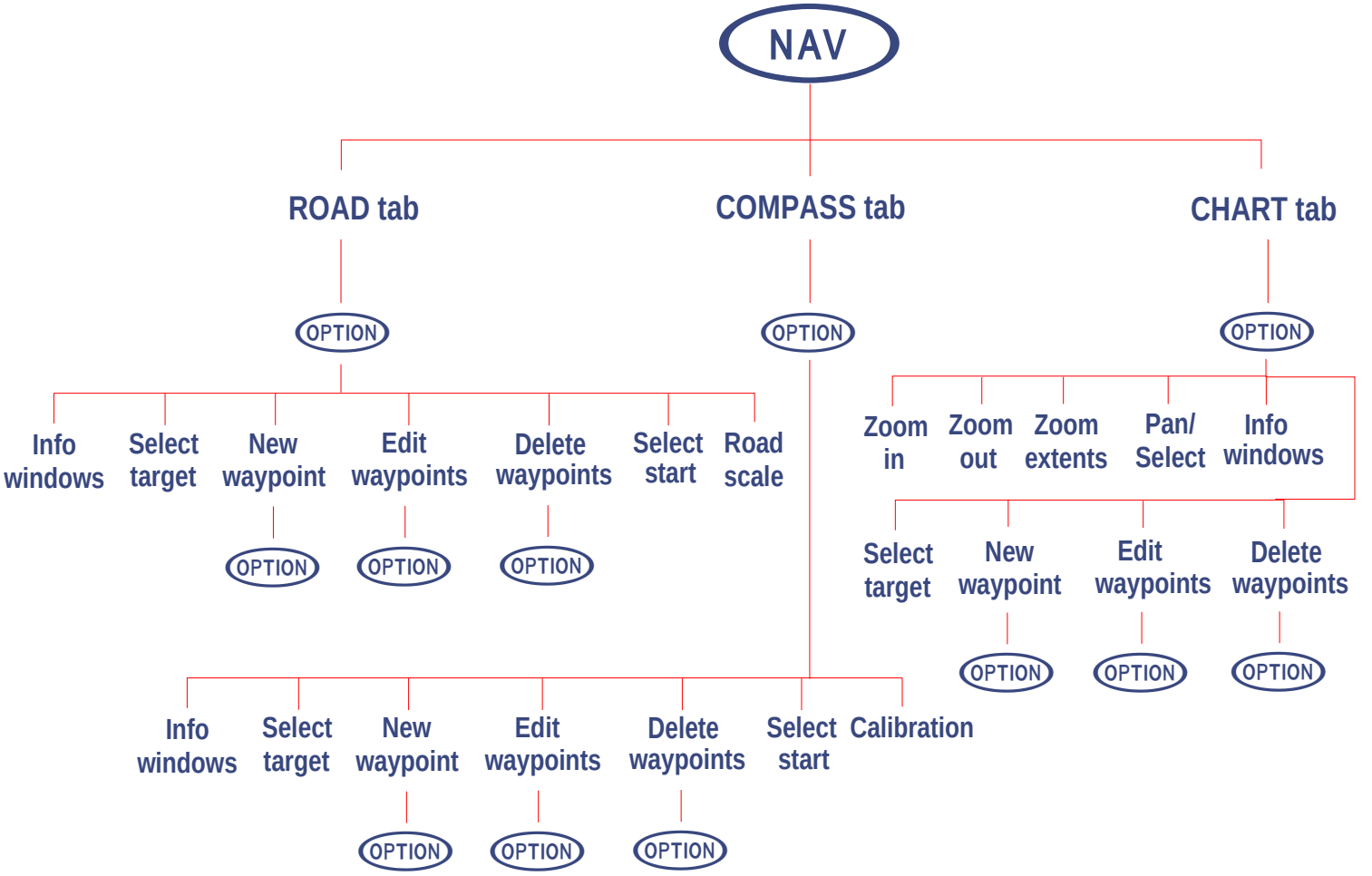
Each tab has multiple levels. As you complete certain tasks, you move to different levels of the system. To return to a top level screen at any time press CLOSE until the top level screen is displayed for that tab. To configure a parameter using the Setup tab, for example, press SYS until the Setup tab is active. This is a top level screen. Select the Configurations option. You are now at a second level screen. When you have edited the configuration, return to the top level screen by pressing CLOSE until the Select screen appears.

Main menu structure

The next three diagrams show an outline of the GeoExplorer 3 menu structure. Use them as a handy reference until you are familiar with the menus.




DATA
FILE tab
OPTION
File info
Delete file(s)
OPTION
Base Station
OPTION
NEW tab
UPDATE tab
MAP tab
New feature list
Update feature list
OPTION
Attribute entry form
OPTION
OPTION
Attribute entry form
OPTION
(Un)Delete
Sort
Filter
OPTION
Position/ Summary
OPTION
Offset & Segment
OPTION
Text entry
OPTION
Numeric entry
OPTION
Menu entry
Date & Time entry
OPTION
Zoom in
Zoom out
Zoom extents
Pan/ Select
Delete
Layers
Filter
OPTION


NAV
ROAD tab
COMPASS tab
CHART tab
OPTION
OPTION
OPTION
Info windows
Select target
New waypoint
Edit waypoints
Delete waypoints
Select start
Road scale
OPTION
OPTION
OPTION
Zoom in
Zoom out
Zoom extents
Pan/ Select
Info windows
Select target
New waypoint
Edit waypoints
Delete waypoints
OPTION
OPTION
OPTION
Info windows
Select target
New waypoint
Edit waypoints
Delete waypoints
Select start
Calibration
OPTION
OPTION
OPTION

Components and accessories

The GeoExplorer 3 data collection system has the following components:

- **The GeoExplorer 3 handheld data collector**
- **GeoExplorer 3 Support Module**
- **GPS Pathfinder® Office software**
- **GeoExplorer 3 Operation Guide CD**
- **QuickStart**
- **Standard accessories**
  - **Data collector pouch**
  - **Serial clip**
  - **Lanyard**
  - **Null modem cable**

The GeoExplorer 3 data collection system also contains the following optional accessories:

- **Beacon-on-a-Belt™ (BoB) receiver**
- **External antenna option**
- **GeoExplorer 3 external power kit**

Before you unpack the components and accessories see **Inspecting the system**.

Inspecting the system

When you receive your GeoExplorer 3 data collection system, inspect all contents for visible damage (scratches, dents) and if any instruments appear damaged, notify the carrier. Keep the shipping and packaging material for the carrier's inspection.

You will need to provide a part number to return a component to Trimble. Extra components can be also be ordered.

All components and part numbers are listed in this manual, along with instructions for returning goods to Trimble.

If you have purchased the ...	See ...
GeoExplorer 3 data collection system	**GeoExplorer 3 full equipment list**
GeoExplorer 3 external power kit	**GeoExplorer 3 external power kit**
GeoExplorer 3 external antenna kit	**GeoExplorer 3 external antenna kit**
Beacon-on-a-Belt system	**Beacon-on-a-Belt (BoB) receiver equipment list**
Beacon-on-a-Belt (BoB) external power kit	**Beacon-on-a-Belt (BoB) receiver external power kit**

GeoExplorer 3 full equipment list

The following table lists the product name and Trimble part number for each item included with the GeoExplorer 3 data collection system. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number
GeoExplorer 3 data collection system	39100-00-ENG
GeoExplorer 3 data collector	38376-00
GeoExplorer 3 standard accessories	38402-00-ENG
GeoExplorer 3 data collector pouch	38599
Null modem cable	18532
GeoExplorer 3 data collector lanyard	36996
GeoExplorer 3 serial clip	38595-00
GeoExplorer 3 support module	38604-00
GeoExplorer 3 QuickStart	38598-00-ENG
GeoExplorer 3 Operation Guide CD	38596-00
GeoExplorer 3 Release Notes	38597-00-ENG
Warranty Activation Card	25110-00

GeoExplorer 3 RTCM/NMEA splitter cable (optional)	39142
GeoExplorer 3 hard carrying case (optional)	39292-00
GeoExplorer 3 Operation Guide (optional printed manual)	39628-00-ENG
GPS Pathfinder Office software system	34191-25-ENG
Mapping Systems General Reference	24177-00
GPS Pathfinder Office v2.50 software CD	34191-25
GPS Pathfinder Office v2.50 Release Notes	34195-25-ENG
GPS Pathfinder Office v2.50 Getting Started Guide	34231-00-ENG
GPS Pathfinder Office manual set (optional)	34192-25-ENG

GeoExplorer 3c edition equipment list

Equipment description	Part Number
GeoExplorer 3c data collection system	39100-50-ENG
(this is the same as the GeoExplorer 3 data collection system but with different firmware)	

GeoExplorer 3 external power kit

The following table lists the product name and Trimble part number for each item included with the GeoExplorer 3 external power kit. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number
GeoExplorer 3 External Power Kit	39001-00
Shoulder carrying pouch	21754-10
12 V camcorder battery	17466
Null modem cable	18532
External power splitter cable	39183
Vehicle adaptor cable	39182
Camcorder adaptor cable	39181
Camcorder charger cable	39184
Wall power cable	39180
Power supply (x2)	38874

GeoExplorer 3 external antenna kit

The following table lists the product name and Trimble part number of the GeoExplorer 3 external antenna kit. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number
GeoExplorer 3 External Antenna Kit	39002-00

Beacon-on-a-Belt (BoB) receiver equipment list

The following table lists the product name and Trimble part number for each item included with the Beacon-on-a-Belt (BoB) system. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number
Beacon-on-a-Belt (BoB) system	38600-00-ENG
BoB receiver	38508-00
BoB receiver pouch	38603
Walll power cable	39180
Power supply	38874
Warranty Activation Card	25110-00
PC-BoB software	38601-00
BoB Receiver Manual	38602-00-ENG
Null modem cable	18532

Beacon-on-a-Belt (BoB) receiver external power kit

The following table lists the product name and Trimble part number for each item included with the Beacon-on-a-Belt (BoB) external power kit. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number
Beacon-on-a-Belt (BoB) External power kit	39003-00
Camcorder	17466
Camcorder adaptor cable	39181
Vehicle adaptor cable	39182
Camcorder charger cable	39184
Power supply	38874
Vehicle splitter cable	21756

The GeoExplorer 3 handheld data collector

The GeoExplorer 3 handheld data collector is a high performance 12-channel GPS receiver. It is a battery-powered unit designed for use in the field. With the GeoExplorer 3 you can navigate to points of interest and also store up to 1 MB of position and attribute information for point, line, and area features.

Maintenance and care of your GeoExplorer 3

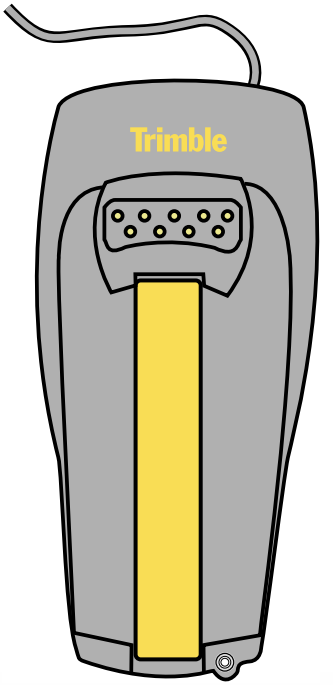
To maintain and care for your GeoExplorer 3 handheld data collector:

- keep the outer surface free of dirt and dust
- keep the connectors free of dirt and dust
- recharge the internal battery when required

GeoExplorer 3 Support Module

The GeoExplorer 3 Support Module is used to transfer data between the GeoExplorer 3 and the PC software and also charge the internal battery.

You can put the GeoExplorer 3 handheld into the GeoExplorer 3 Support Module when the GeoExplorer 3 is on or off. The GeoExplorer 3 Support Module automatically detects that the GeoExplorer 3 is present, and puts it in standby mode.



GPS Pathfinder® Office software

The Pathfinder Office software runs under Microsoft Windows 95, Windows 98, or Microsoft Windows NT. It provides all the tools you need to manage a data collection project, handling data from the entire range of Mapping and GIS data collection systems that use Trimble GPS receivers.

The Pathfinder Office software lets you:

- plan the best times to collect GPS positions, using the powerful Quick Plan Mission Planning utility.
- create separate projects, which let you manage the data associated with these projects effectively and conveniently.
- construct and edit data dictionaries, which can be used to control the data collection operation and which make sure that the collected data is complete, accurate, and compatible with your GIS, CAD package, or database.
- transfer files to and from GPS receivers and handheld data collectors.
- process the GPS positional data to improve its accuracy.
- display and edit collected data in the office, optionally overlaying this data onto a vector or raster background map.

- export the collected, processed, and edited data to a GIS, CAD, or database format.
- produce a scaled plot as a paper record of the data.
- set up configurations for your GeoExplorer 3 data collector

The GeoExplorer 3 data collection system uses Pathfinder Office to make best use of the data collected in the field. Pathfinder Office software is used to transfer GPS data to a PC, and then differentially correct, view, and edit the data. Pathfinder Office software also exports the data in a format suitable for your GIS or CAD system.

GeoExplorer 3 Operation Guide CD

The standard GeoExplorer 3 data collection system includes the GeoExplorer 3 Operation Guide CD.

The CD is designed to provide you with hands-on learning that is easy and informative.

It contains:

- an interactive tutorial
- a documentation tutorial
- a GeoExplorer 3 reference guide detailing every system function

QuickStart

The GeoExplorer 3 **QuickStart** is designed to take into the field with you.

It contains information about:

- the GeoExplorer 3 handheld
- the menu structure
- Status bar icons
- Satellite information
- and some basic troubleshooting information

Standard accessories

The following sections describe the standard accessories available as part of your GeoExplorer 3 data collection system.

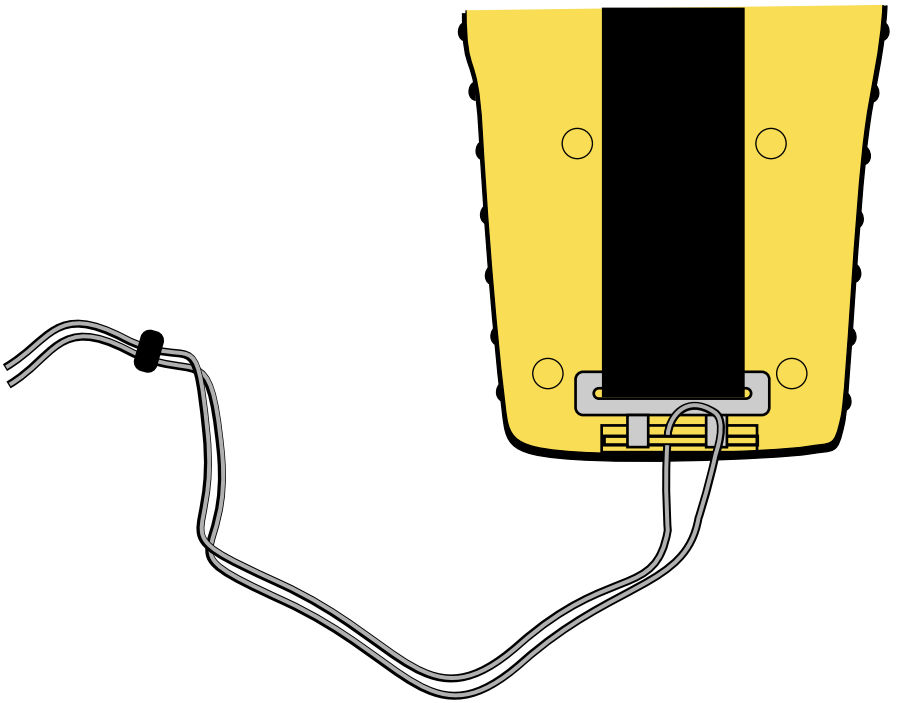
- **Data collector pouch**
- **Lanyard**
- **Serial clip**
- **Null modem cable**

Data collector pouch

The data collector pouch is provided to protect your GeoExplorer 3 handheld data collector and enable you to store and transport it easily. The data collector pouch fits ergonomically onto your GeoExplorer 3 belt as shown:

Lanyard

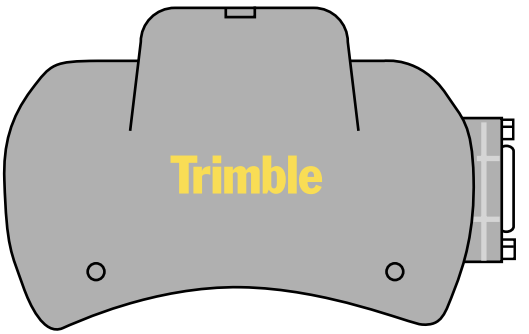
The lanyard can be attached to your GeoExplorer 3 data collector or to the data collector pouch to make it easier to carry. Connect the lanyard to the GeoExplorer 3 as shown:



Serial clip

The serial clip is attached to the swipes on the rear of the GeoExplorer 3 data collector to let you connect to an **RTCM** device to receive real-time corrections, or to connect to a device that receives **NMEA** data.

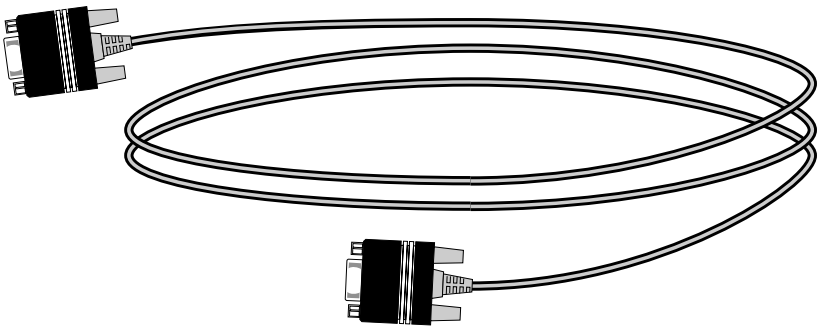
If you do not have a GeoExplorer 3 Support Module available, you can also use the serial clip to connect to your office computer to transfer data.



Null modem cable

The supplied DB-9 null modem cable is used to connect the GeoExplorer 3 Support Module to the office computer.

The null modem cable can also be used to connect the GeoExplorer 3 data collector to the office computer via the serial clip, and to connect to the BoB receiver, where the cable-free transmission is either not enabled, or not possible due to interference.



GeoExplorer 3 optional accessories

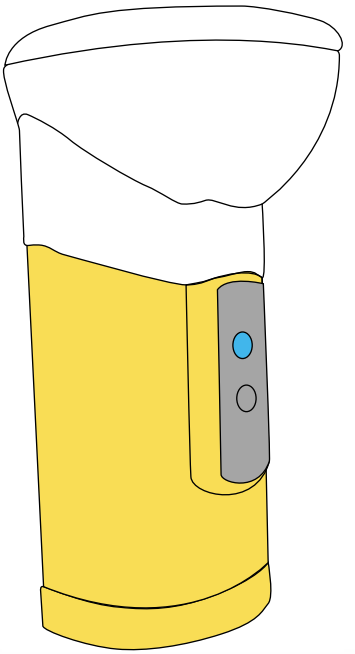
The optional accessories for the GeoExplorer 3 data collection system are:

- **Beacon-on-a-Belt™ (BoB) receiver**
- **GeoExplorer 3 external power kit**
- **External antenna option** (vehicle and range pole mount)

Beacon-on-a-Belt™ (BoB) receiver

The BoB receiver is a belt-mounted MSK receiver capable of receiving differential corrections from DGPS radiobeacons using the **RTCM** SC-104 standard format. The BoB receiver retransmits this data both on a low power cable-free link and on a standard RS-232 connection.

Configure the BoB receiver using the PC-BoB Configuration Management™ software for the BoB receiver.



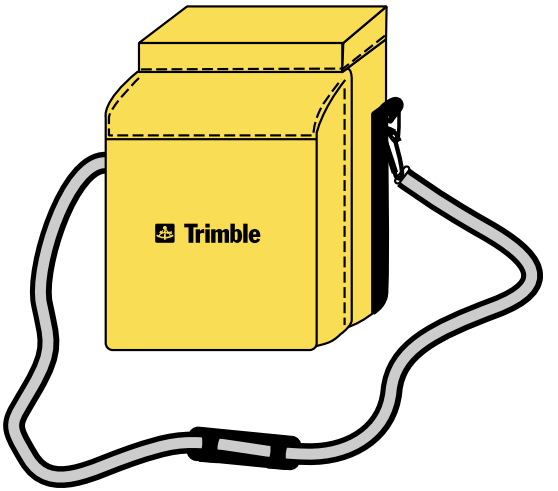
GeoExplorer 3 external power kit

The standard GeoExplorer 3 data collection system comes with a factory-installed Lithium-ion battery. This will provide power for the GeoExplorer 3 for up to 10 hours before needing to be recharged (less if the backlight is used). For additional battery life you can purchase the external power kit. This lets you power the GeoExplorer 3 receiver from a rechargeable 12 V camcorder battery, or from a vehicle. The kit includes:

- **Shoulder carrying pouch**
- **12 V camcorder battery and charging cable**
- **Vehicle power adaptor**

Shoulder carrying pouch

The shoulder carrying pouch can accommodate the GeoExplorer 3 handheld data collector, a 12 V camcorder battery, and cable accessories:



12 V camcorder battery and charging cable

The rechargeable 12 V camcorder battery provides 20 hours of continuous GeoExplorer 3 operation, and can be fully recharged overnight.

The external power kit includes a cable that connects the GeoExplorer 3 to the camcorder battery, and a cable that connects the battery to a wall socket for recharging using a splitter cable. The splitter cable can also be used to power the GeoExplorer 3 using a cable from a vehicle's cigarette lighter socket.

Vehicle power adaptor

The vehicle power adaptor is a cable that connects the charging cable to the vehicle cigarette lighter socket.

External antenna option

In situations where the internal antenna is unusable (for example, in a vehicle) an optional external antenna kit is available. The external antenna kit contains an antenna with a magnetic base and a pole mount. Poles are purchased separately.

TUTORIAL

The Tutorial provides step-by-step instructions for some of the tasks that you will perform when using the GeoExplorer 3 data collection system. Two of the primary functions of the GeoExplorer 3 are data collection and data update. Of the five parts to the tutorial, three relate to data collection and two to real-time data update. They are:

Data Collection

- **Preparing for collection**
- **Data collection**
- **Processing the data**

Data Update

- **Preparing for update**
- **Data update**

NOTE It is important that you read the **Introduction** before you proceed with this tutorial. You need to know about the menu structure of the GeoExplorer 3 data collection system and how to use the keypad on the GeoExplorer 3 handheld.

To help you master the main concepts and tasks involved, the tutorial is based on the following scenario:

The Waterstone National Park requires an inventory of its assets and resources. These include gates, roads, signs, campgrounds and their amenities, water faucets, lakes, and other resources in the park. Information needs to be collected about each entity, indicating its condition and other specific information. As a Park Ranger, you and your field crew are responsible for collecting new data, as well as updating the existing GIS data.

Data collection: In this part of the tutorial you create a project for Waterstone Park. Then you create a data dictionary, or list of features, using the GPS Pathfinder® Office software. When the data dictionary is transferred to the GeoExplorer 3 data collection system, you go out to the park and use it to record features and attributes. Back in the office, you postprocess the data to achieve better results and export the data to the Waterstone National Park GIS.

Data update: In this part of the tutorial you update existing GIS data using the GeoExplorer 3 data collection system. Before going back to the park you upload existing data to the GeoExplorer 3 and prepare for an update session. In the field, you use the GeoExplorer 3 data collection system and the Beacon-on-a-Belt (BoB) **real-time differential GPS** source to navigate back to features and then update the attributes.

Preparing for collection

Before going to Waterstone Park to collect data, you need to create a project and a data dictionary. When the data dictionary is complete, transfer it to the GeoExplorer 3 data collection system.

Preparing for collection provides step-by-step instructions to help you prepare to go out to the field and collect data. Topics are:

- **Creating a project**
- **Creating a data dictionary using Pathfinder Office**
- **Data transfer**
- **Checking the equipment**

Creating a project

The Pathfinder Office software is a powerful Windows-based tool for processing and managing GPS data. Pathfinder Office lets you easily plan your data collection session and process the GPS data successfully.

Use the Pathfinder Office software to organize work into projects. Dividing the work in this way helps you manage files. You can give all projects meaningful names, and assign separate folders for base, export, and backup files.

You can also set up projects for different groups of data. For example, you could create a project for each major monitoring task, as well as for each region of the park, or for each month.

For this tutorial create a project named **`Geo 3 Tutorial`**.

For more information refer to the Pathfinder Office online Help.

Creating a data dictionary using Pathfinder Office

A data dictionary contains a description of the features and attributes relevant to a particular project or job. It is used in the field to control the collection of a **feature** and its **attributes**.

Understanding how to put together a data dictionary is very important. Design a data dictionary with your Geographic Information System (GIS) in mind. In particular, be familiar with any format restrictions imposed by the GIS, otherwise you may not be able to import the data you collect.

The Waterstone National Park already has a GIS. You need to create a data dictionary to collect new data, and update existing data, for import to the GIS.

The different park components that you need to map are 'features'. These include gates, roads, water faucets, and lakes. The different types of information that you record for each type of feature are 'attributes'. For example, the name of a road would be an attribute, or condition, of a gate.

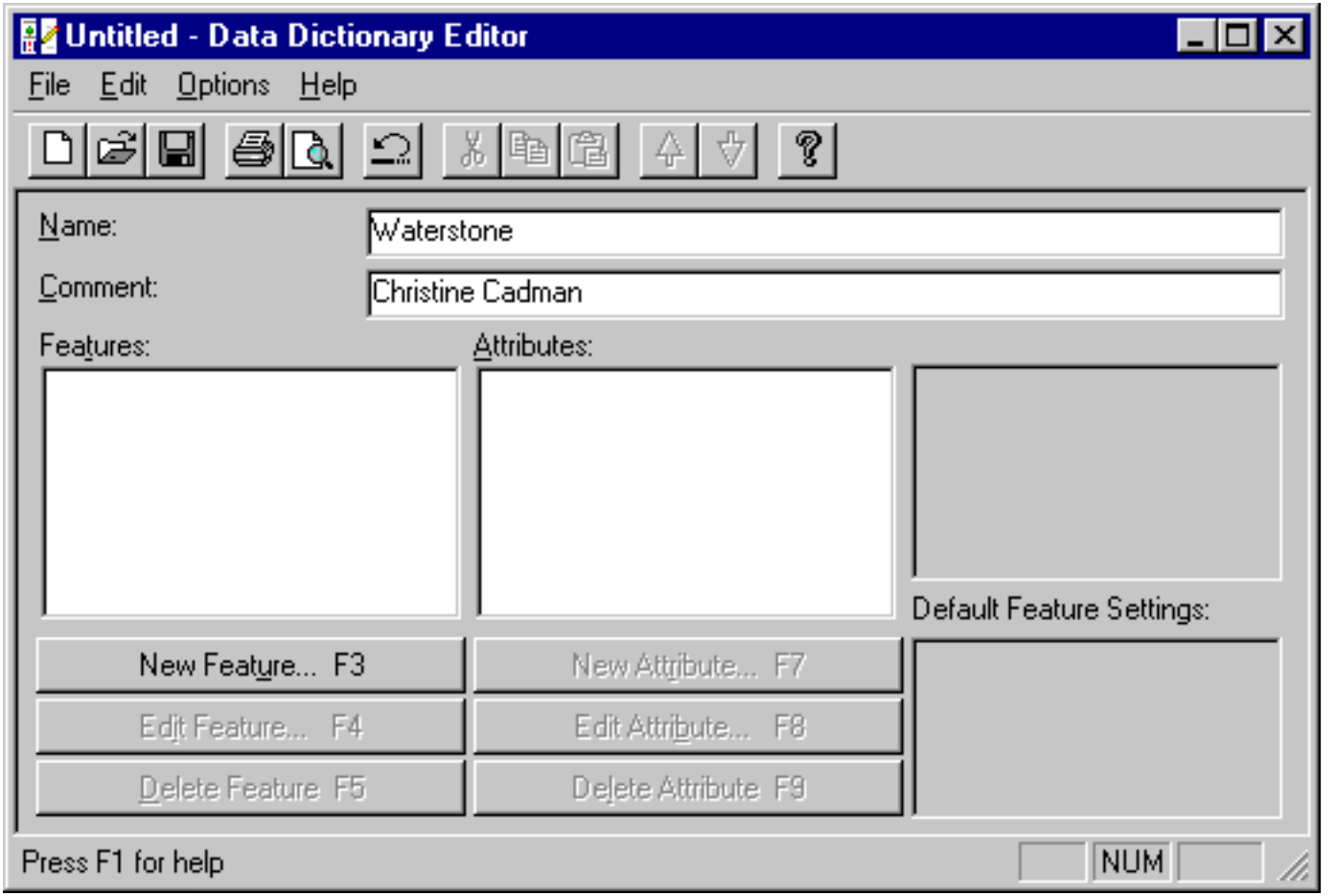
In this part of the tutorial the following tasks are explained:

- Starting a data dictionary
- Creating a point feature
  - Creating a menu attribute
  - Creating a numeric attribute
- Creating a line feature
  - Creating a text attribute
  - Creating a menu attribute with a default value
- Creating an area feature
- Creating a point feature with a date attribute
  - Creating the numeric attributes
  - Creating a date attribute
- Saving the data dictionary

Starting a data dictionary

1. To start the Data Dictionary Editor in Pathfinder Office, select Utilities / Data Dictionary Editor.
2. In the Name field type **`Waterstone`**. This is the title of the data dictionary that appears on the GeoExplorer 3 handheld.

3. In the Comment field type your name. This is optional, but a good reference. The dialog box looks similar to the following:



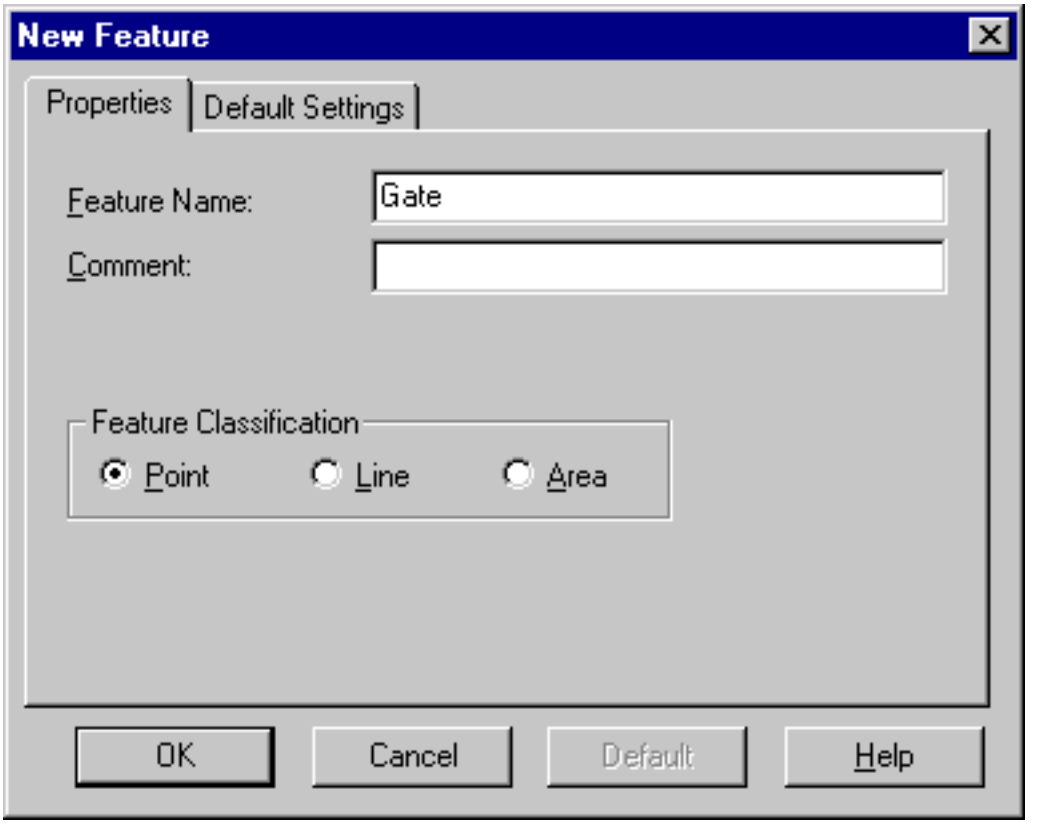
Creating a point feature

The first type of feature you are going to create is a gate. It will be used to do an inventory of where all the gates are and what condition they are in.

To create a point feature:

1. Click **New Feature**. Make sure that the Properties tab is selected.
2. In the Feature Name field, type **`Gate`**.

   This is the name that appears on the GeoExplorer 3 handheld when you use this data dictionary in the field.



3. In the Feature Classification group, the Point option is the default. A gate is at a single location on the earth's surface, so a point is the most appropriate classification for this feature. Leave this setting as is.
4. Click **OK**.

   The Data Dictionary Editor screen displays 'Gate' in the list of features. A symbol indicates that it is a point feature.

First create the gate point feature and then add the attributes. There are two attributes for the gate feature: Condition (menu attribute) and Lock ID (numeric attribute).

- **Creating a menu attribute**
- **Creating a numeric attribute**

Creating a menu attribute

Menu attributes are useful when the information you need to store is a defined set of options. This standardizes the entry of information and makes it quicker to enter values in the field.

The first attribute of the gate is Condition. The only values for this attribute are good, repair, or repaint, so making this a menu attribute is appropriate. In the field, a menu with these three values appears when you are entering the Condition attribute.

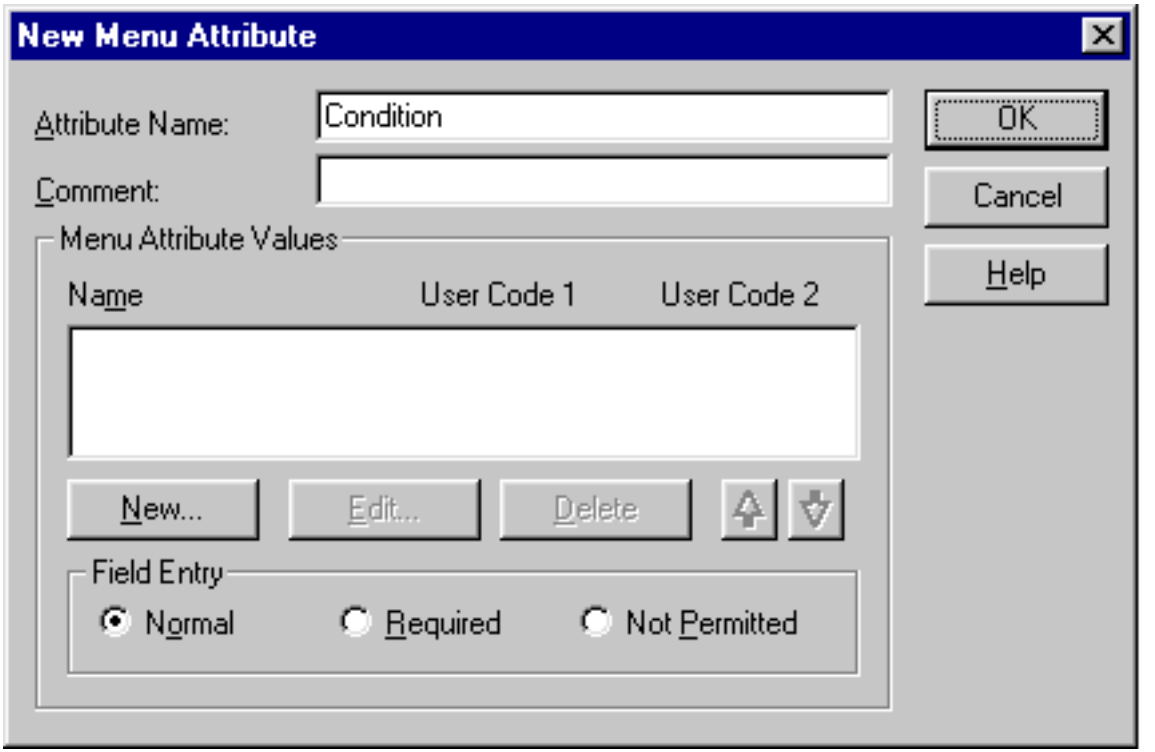
To create a menu attribute:

1. Click **New Attribute**. The following dialog appears:

2. Select the Menu option and click **OK**.

   The New Menu Attribute dialog appears.

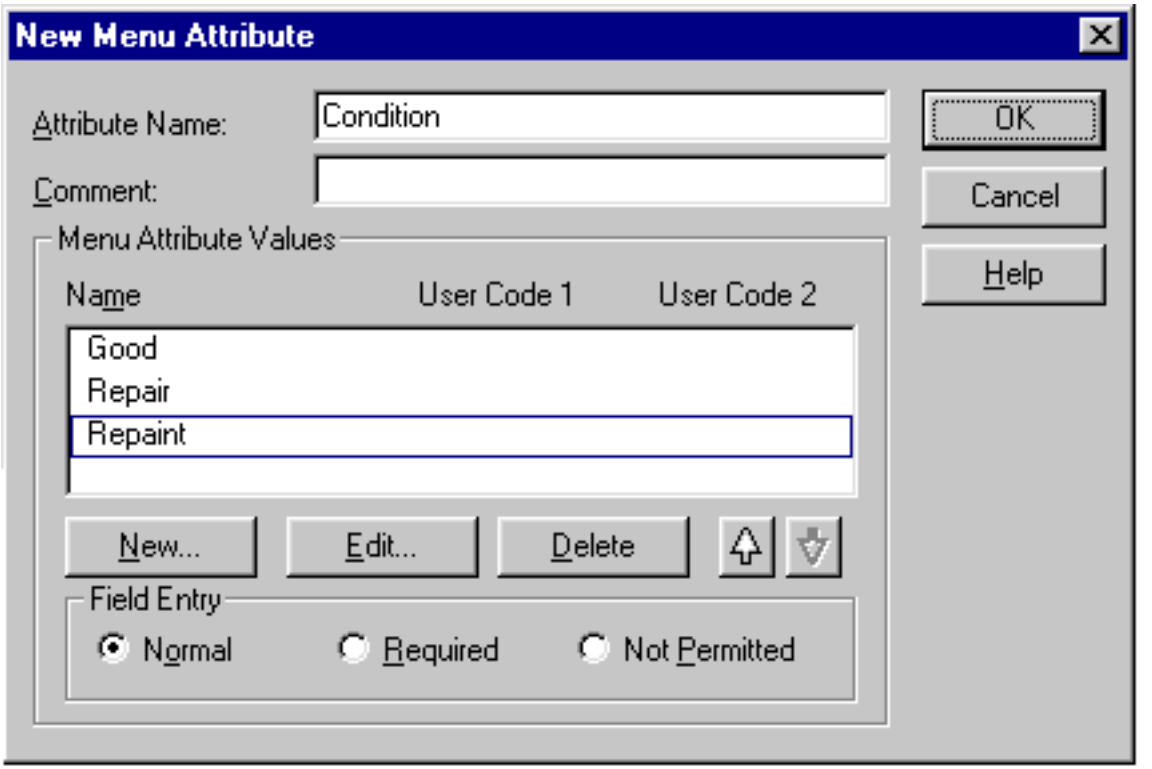
3. We need to know the condition of the gates, so in the Attribute Name field, type **`Condition`**:



4. Click **New**. The New Attribute Value – Menu Item dialog appears.
5. In the Attribute Value field, type **`Good`**. Click **Add**.

6. In the Attribute Value field type **`Repair`**. Click **Add**.
7. In the Attribute Value field type **`Repaint`**. Click **Add.**

8. Click **Close** to return to the New Menu Attribute dialog. It displays the new menu attribute values:



9. Click **OK** to create this attribute. Then click **Close** to close the New Attribute Type dialog.

Creating a numeric attribute

Use a numeric attribute type to enter numeric values in fields. The minimum and maximum values help eliminate incorrect entries, and a sensible default value can save time.

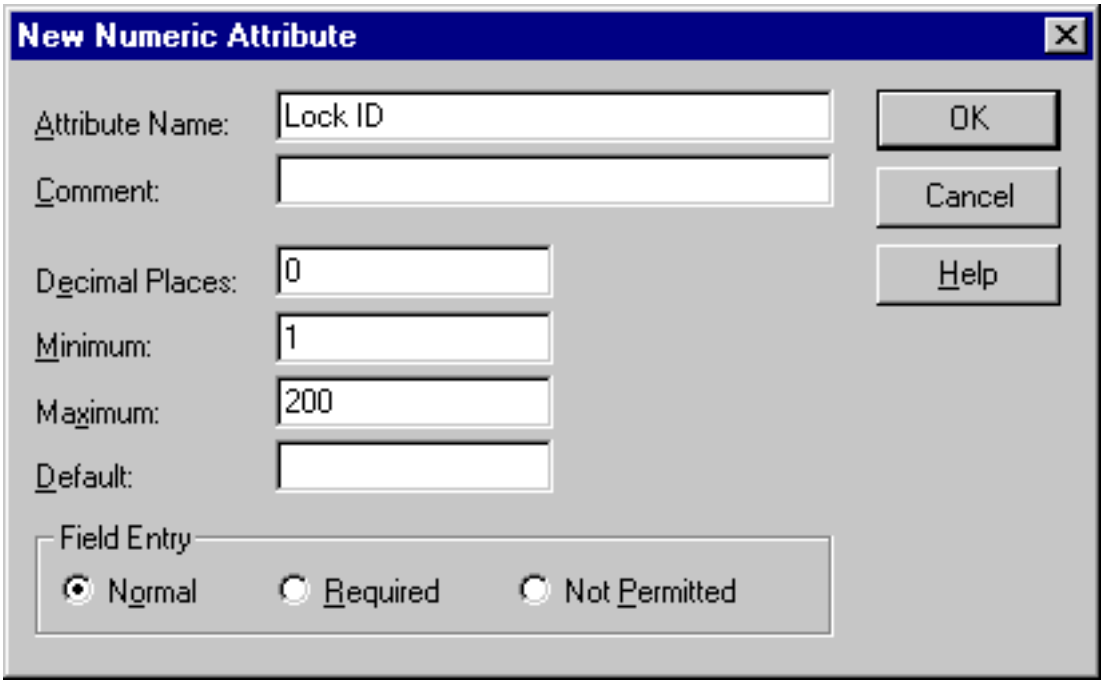
The next attribute you need to create for the gate is Lock ID. A lock ID number identifies which key corresponds to which lock in the park. It is recorded as a number between 1 and 200.

NOTE Before creating this numeric attribute, make sure the Numeric Default Values Required command is turned off. This is necessary if you are to create numeric attributes without default values. To turn off this command select Options / Numeric Default Values Required. There must be **no** check mark beside the command. For more information refer to the Pathfinder Office online Help.

To create a numeric attribute:

1. In the New Attribute Type dialog, select the Numeric option and click **OK**.
2. In the Attribute Name field, type **`Lock ID`**.
3. In the Decimal Places field, the default is 0. Do not change this, as the lock ID numbers do not have any decimal places.

4. In the Minimum field type **1** and in the Maximum field type **200**, as all lock ID numbers are between 1 and 200. This limits the range of values that you can enter:



5. Click **OK** to create this attribute.
6. Click **Close** to close the New Attribute Type dialog. The attributes you created now appear in the attribute field.

NOTE In the field, if you enter a value outside the minimum / maximum range, an error message appears on the screen of the GeoExplorer 3 handheld.

Creating a line feature

You need to map the roads in the park, so create a line feature.

To create a line feature:

1. Click **New Feature**.

   The New Feature dialog appears.

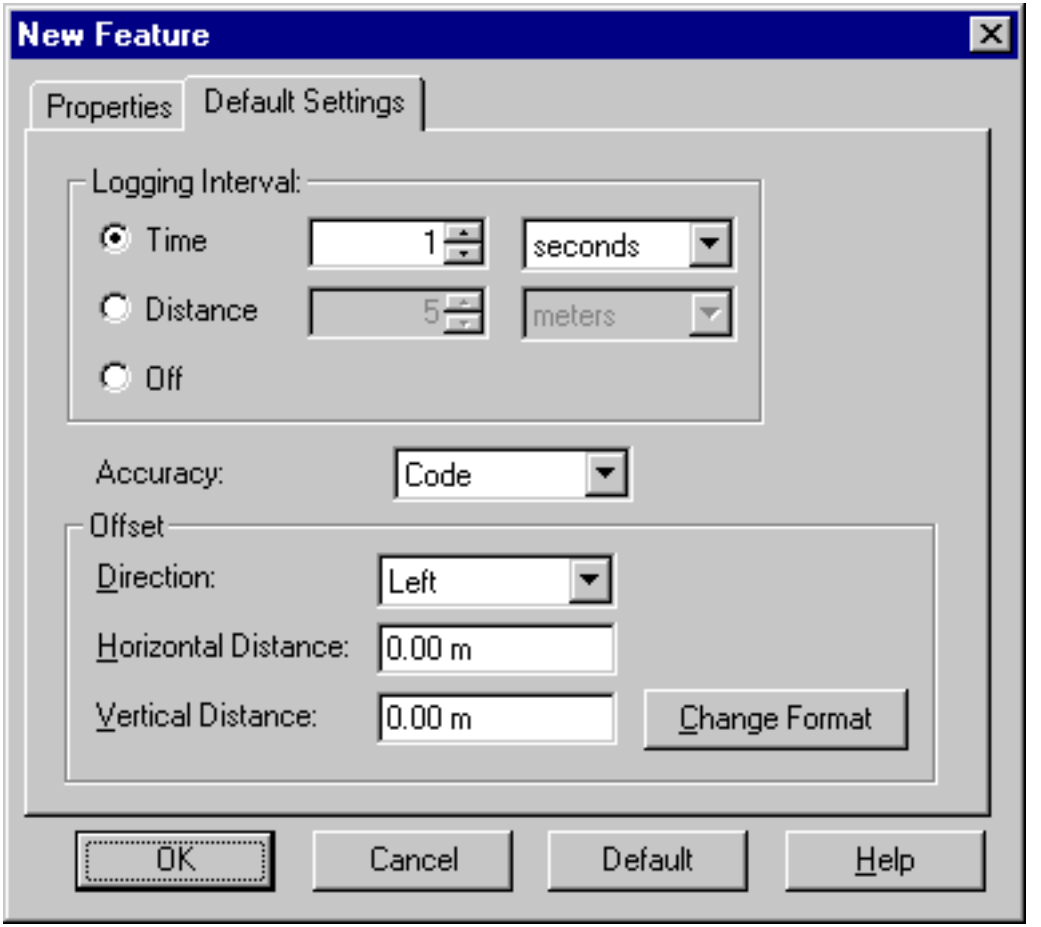
2. In the Feature Name field, type **Road**.

3. In the Feature Classification group, select Line.

4. Select the Default Settings tab to view the logging interval for this feature.

   The logging interval is the time between feature GPS positions. The default logging interval for line features is 5 seconds. This means that when you start logging a line feature, the GeoExplorer 3 logs one GPS position every five seconds, until you end the feature logging. In Waterstone Park you will be driving slowly, so change the logging interval to 1 second for the Road feature. An increased logging rate makes sure that more data is collected and a more detailed map of the roads is provided.

5. Use the Logging Interval list boxes to change the logging interval to 1 second:



6. Click **OK** to create this feature.

NOTE When you are in the field, you can also use the GeoExplorer 3 data collection system to edit the **Feature settings**.

Now that you have created the road line feature, add the attributes. There are two attributes for this feature: Road Name (text attribute) and Speed Limit (menu attribute).

- **Creating a text attribute**
- **Creating a menu attribute with a default value**

Creating a text attribute

Text attributes are useful when the information to be stored varies for different occurrences of a feature and when a defined menu list is impractical. For this tutorial you want to record the name of each road. There are too many road names to make a menu, so a text attribute is appropriate. It lets you enter letters, numbers, and punctuation, for each road name. To make sure that the road name is entered, set the attribute as required. This means that, in the field, a name must be entered before the road feature can be saved.

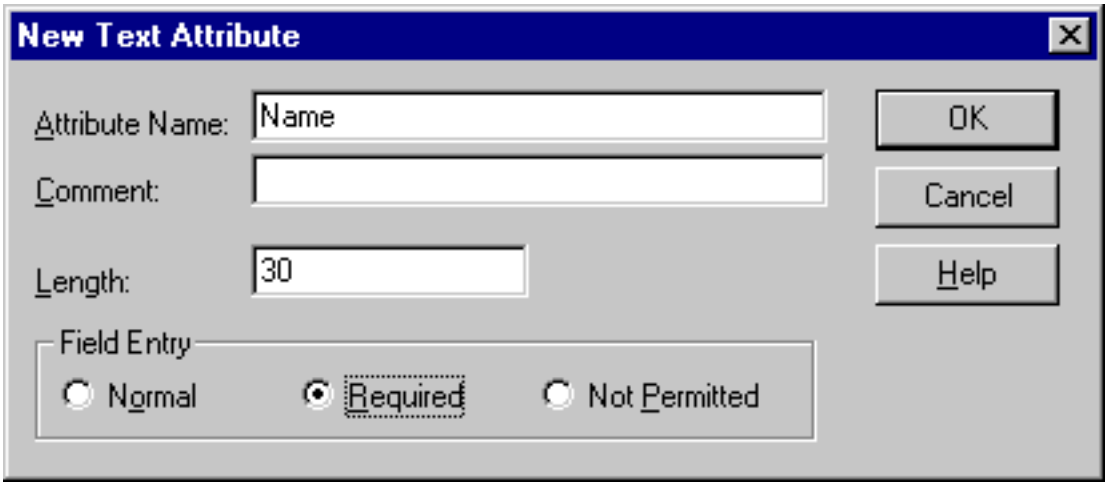
To create a required text attribute:

1. Click **New Attribute**.

   The New Attribute Type dialog appears.

2. In the Type field, select Text and click **OK**.
3. In the Attribute Name field, type **`Name`**.
4. The Length field determines the number of characters that can be entered for the attribute. By default, the length of a text attribute is 30 characters. You can change this, but for this tutorial leave as is.

5. In the Field Entry group, select the Required option:



6. Click **OK** to create this attribute.

Creating a menu attribute with a default value

The next attribute for the road is Speed Limit. You want to record the speed limit for each of the roads. The values are defined numbers within a certain range, so a menu attribute is appropriate. Most of the roads in Waterstone Park have a speed limit of 10 mph, so make 10 the default value. This saves time in the field, as the speed limit attribute needs to be entered only if it is not 10 mph.

To create a menu attribute with a default value:

1. In the New Attribute Type dialog, select the Menu option and click **OK**.

   The New Menu Attribute dialog appears.

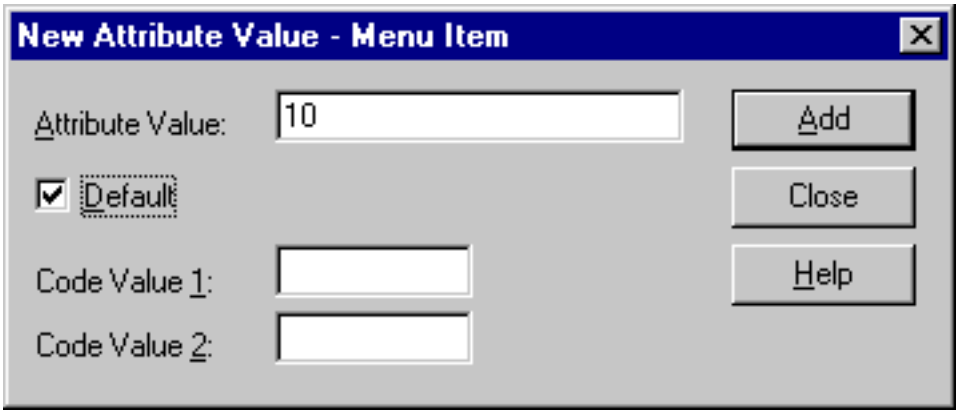
2. In the Attribute Name field, type **`Speed Limit`**. Type **`(mph)`** after the attribute name to show the units.

3. Click **New**.

   The New Attribute Value – Menu Item dialog appears.

4. In the Attribute Value field, type **`5`** and click **Add**.

5. In the Attribute Value field, type **10** and set this value as the default. To do this, select the Default check box and click **Add**.



6. In the Attribute Value field type **15** and click **Add**. Repeat for **20** and **25**.
7. When you have entered all the values, click **Close** to return to the New Menu Attribute dialog. It now displays the attribute values you created. An * symbol appears in front of 10 to show that it is the default.
8. Click **OK** to create this attribute.
9. Click **Close** to close the New Attribute dialog.

Creating an area feature

You need to map the lakes in Waterstone Park, so create an area feature. You do not need to record any information about the lake, so you do not need attributes for this feature. Create the Lake feature in the same way that you created the Gate feature, but this time in the New Feature dialog select Area in the Feature Classification group.

For more information see **Creating a point feature**.

Creating a point feature with a date attribute

The last feature to create is a water faucet. Use this point feature to record the location of water faucets in the park. Create the Water Faucet feature the same way that you created the Gate feature. For more information see **Creating a point feature**.

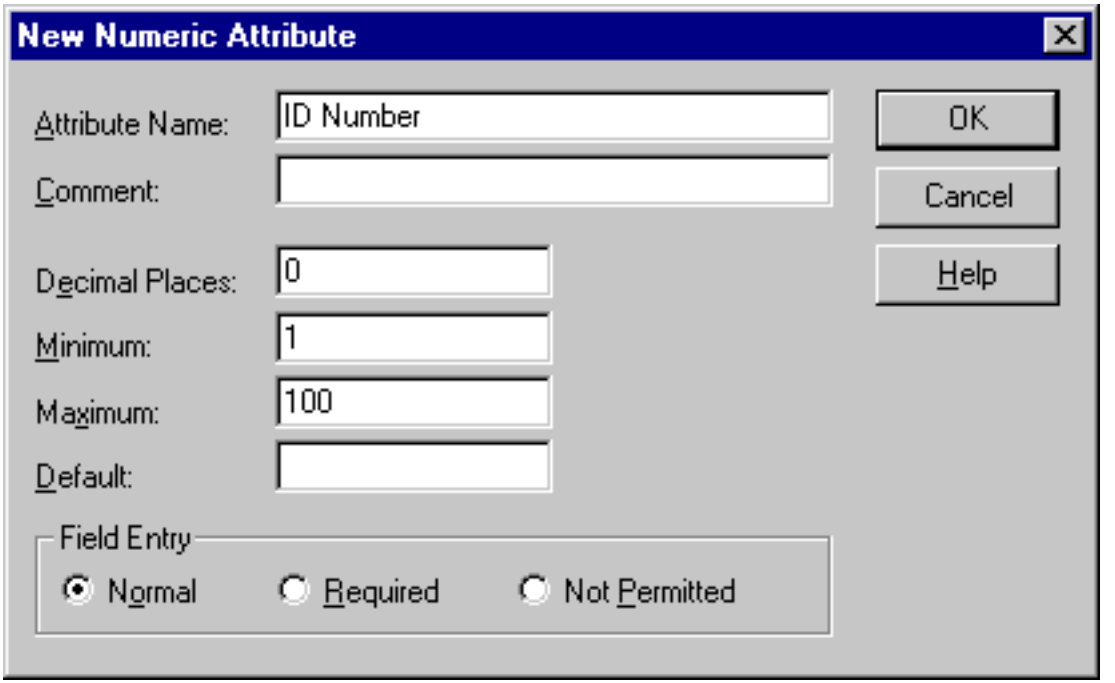
There are three attributes for the Water Faucet feature: ID Number (numeric attribute), Test Tube Number (numeric attribute), and Date (date attribute).

- **Creating the numeric attributes**
- **Creating a date attribute**

Creating the numeric attributes

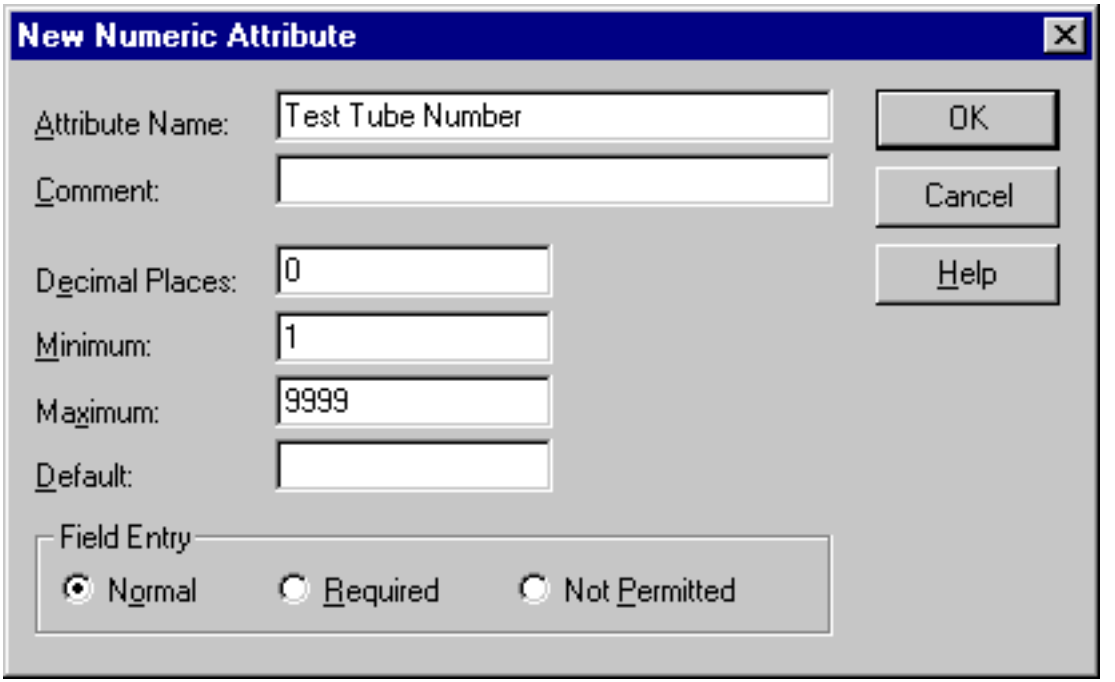
All water faucets in the park are labeled with an identification number. You will record this number when collecting data.

Create the ID Number attribute the same way you created the Lock ID attribute. Use the following values:



Monthly water samples are collected from the water faucets in the park to make sure water is safe for drinking. The samples are collected in pre-numbered test tubes. This test tube number is recorded in the GeoExplorer 3 so that results from the lab can be correctly entered into the GIS.

Create the Test Tube Number attribute the same way you created the Lock ID attribute. Use the following values:



For more information see **Creating a numeric attribute**.

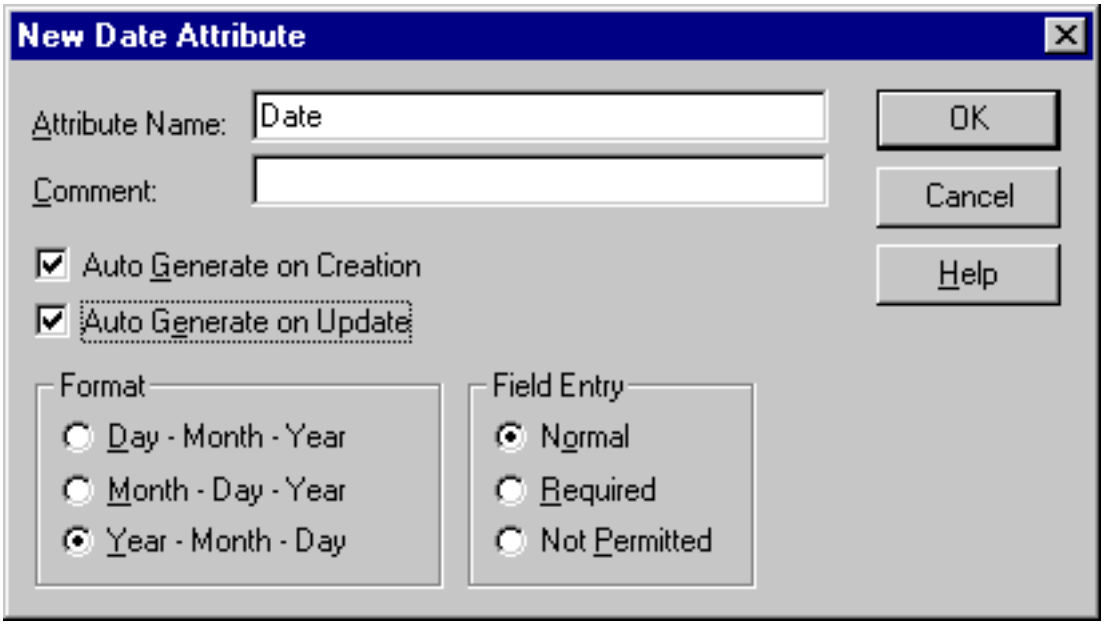
Creating a date attribute

The last attribute for the Water Faucet feature is the date visited. You can create this attribute so that it is automatically generated for each faucet. When a water faucet feature is collected, the current date is automatically entered as the Date attribute.

To create a Date attribute:

1. In the New Attribute Type dialog select the Date option and click **OK**.
2. In the Attribute Name field, type **`Date`**.

3. By default, the Auto Generate on Creation check box is selected. Select the Auto Generate on Update check box, as well.



When you create a new water faucet feature or update an existing one, the GeoExplorer 3 automatically generates the date

4. Click **OK** to create this attribute, then click **Close** to close the New Attribute Type dialog.

Saving the data dictionary

Once you have added all features and their attributes, it is important to save the new data dictionary.

To save the data dictionary:

1. Select File / Save As.

   The Save As dialog appears. By default, the name of the data dictionary is automatically used to generate the file name, for example, C:\Pfdata\Geo 3 Tutorial\waterstone.ddf.

2. Click **Save**.

3. From the menu bar select File / Exit.

For more information about data dictionaries refer to the Pathfinder Office online Help.

NOTE Create a data dictionary in the office or in the field. In the field, use the GeoExplorer 3 data collection system to create a new customized data dictionary, or to add features, attributes, and values to an existing data dictionary.

For more information see **Data dictionaries**.

Data transfer

You need to transfer the Waterstone data dictionary to the GeoExplorer 3 data collection system, so that you can use it in the field to collect data. Use the Data Transfer utility in the Pathfinder Office software to efficiently transfer data between the GeoExplorer 3 and the office computer.

To transfer the Waterstone data dictionary from the office computer to the GeoExplorer 3 data collection system:

1. Place the GeoExplorer 3 handheld in the **GeoExplorer 3 Support Module**. Make sure that the support module is connected to the office computer.

   The GeoExplorer 3 is ready to communicate with the Pathfinder Office software.

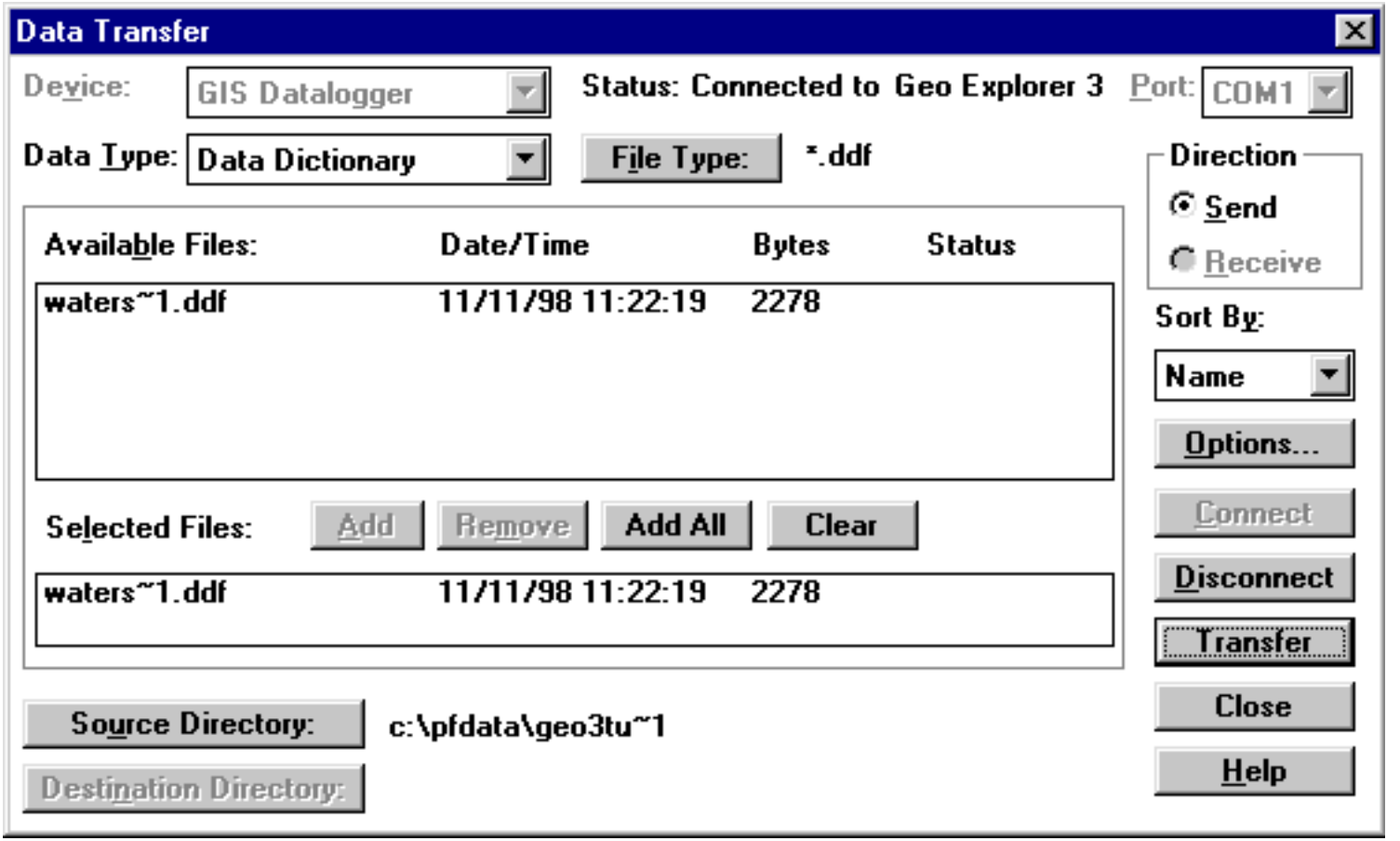
NOTE You do not have to turn on the GeoExplorer 3 to transfer data.

2. To start the Data Transfer utility in Pathfinder Office, select Utilities / Data Transfer.

   The Data Transfer dialog appears.

3. In the Data Type field select Data Dictionary.
4. The Waters~1.ddf file appears in the Available Files field. Click **Add** to move it to the Selected Files list.

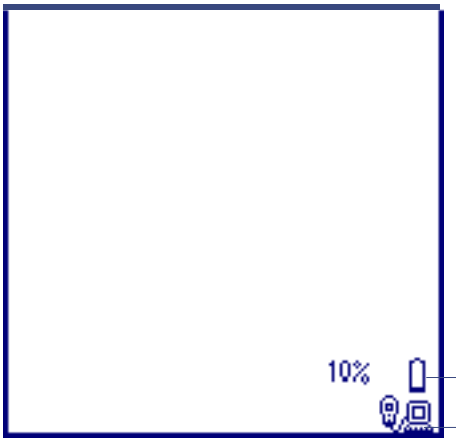
5. The Send option is automatically selected in the Direction group (on the right):



6. Click **Transfer**. The data dictionary is transferred to the GeoExplorer 3. For more information refer to the Pathfinder Office online Help.

Checking the equipment

Before going into the field, check the internal power level to make sure that you have enough power to complete the data collection session. When the GeoExplorer 3 handheld is in the **GeoExplorer 3 Support Module** and turned off, use the Standby screen to check the internal power level.



When you turn off the GeoExplorer 3 and put it in the support module, the standby screen appears. Check that the internal power source is fully charged and that data is being transferred. When the level of the internal power is at its highest, the internal power icon appears full (black).

TIP When the GeoExplorer 3 is turned on, use the **Status bar** to check the level of the internal power. To view the percentage of remaining power use **The Status tab**.

NOTE If the GeoExplorer 3 handheld is still turned on when you put it in the support module, the Standby screen does not appear. The handheld stays on.

Data collection

This part of the tutorial uses the data dictionary just created. You are ready to go to Waterstone National Park and collect features. But first there are some tasks that you should complete. Data collection explains these tasks and gives the step-by-step instructions required to collect point, line, and area features, with a variety of different attributes. Topics include:

- **Initial tasks**
- **Collecting data**
- **Closing a file**

NOTE Read the **Introduction** before proceeding with this tutorial. You need to know about the main structure of the GeoExplorer 3 data collection system and how to use the keypad on the GeoExplorer 3 handheld.

Initial tasks

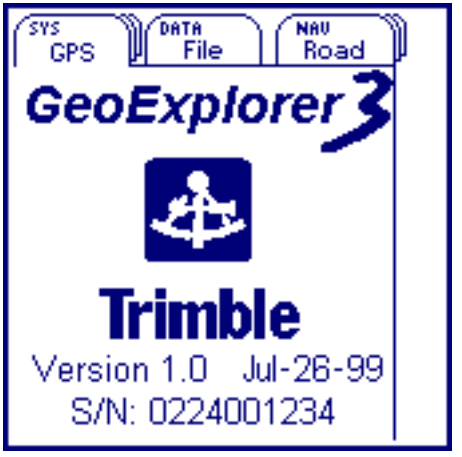
Before starting a data collection session, complete the following tasks:

- **Turning on the GeoExplorer 3 handheld**
- **Getting a clear view of the sky**
- **Checking the GPS status**
- **Creating a new file**

Turning on the GeoExplorer 3 handheld

When you get to the park, press ⏻ to turn on the GeoExplorer 3 handheld.

When the GeoExplorer 3 is turned on a Trimble identification screen appears for a few seconds while a short self-test is performed.



The GPS tab always appears after the identification screen is displayed.

Getting a clear view of the sky

Move to a location where you have a clear view of the sky. Hold the GeoExplorer 3 handheld with the screen towards you. The internal antenna of the GeoExplorer 3 is located above the screen. The receiver does not need to be held perfectly level, but keep the antenna facing upwards, not downwards or sideways.

Signals can be received from any direction but if you cover the antenna the GeoExplorer 3 will no longer track the satellites and will stop computing positions. Satellite signals can be blocked by people, buildings, heavy tree cover, large vehicles, or powerful transmitters. Anything that blocks light also blocks signals. GPS signals can go through leaves, plastic, and glass, but these all weaken the signal.

Checking the GPS status

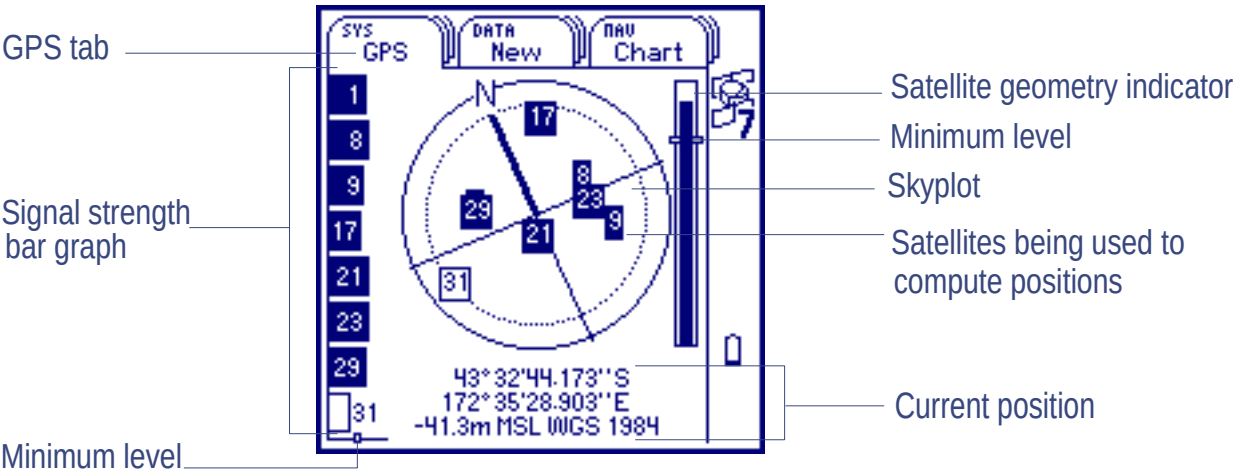
When you turn on the GeoExplorer 3 handheld, it automatically begins to track visible satellites and to calculate its current position. Use the satellite icon to check if the GeoExplorer 3 is computing GPS positions. It provides information about the geometry of the satellites that are being used to compute GPS positions. For more information about this icon see the **Status bar**.

Use the GPS tab to view the satellites currently tracked and those that are being used to calculate the current position. You can also get an indication of how accurate the GPS positions are.

NOTE For further explanation of satellite geometry, and how this can affect your GPS data collection refer to the Mapping Systems General Reference.

To view the GPS screen:

1. Press SYS until the GPS tab is active. The following screen appears:



2. Use the skyplot to check the satellites that the GeoExplorer 3 is currently tracking.

   Black boxes represent satellites that the GeoExplorer 3 is using to compute its current GPS position. Unfilled boxes represent satellites that the GeoExplorer 3 is getting signals from, but not using because the signals are too weak. In the above example, eight satellites are being tracked, and seven are being used to compute GPS positions.

NOTE Numbers with no box represent satellites that are available, but that the GeoExplorer 3 is not receiving signals from.

NOTE The skyplot rotates as you change direction (like a compass). It indicates what direction the GeoExplorer 3 is pointing to.

Your current GPS position is displayed at the bottom of the screen.

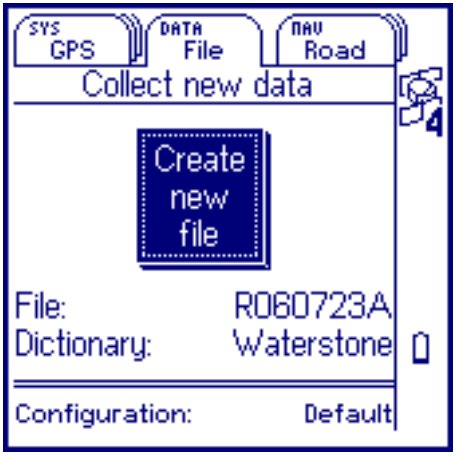
3. Use the signal strength bar graph (on the left), to check the signal strength of the satellites. If the strength of a GPS signal is below the configured minimum level, there may be some obstruction blocking the signal.
4. Use the satellite geometry indicator (on the right), to view the overall quality of the GPS positions. This is determined by the geometry of the satellites. When the bar is above the configured minimum level indicator GPS positions are being computed.

For more information see **The GPS tab**.

Creating a new file

Before you can start a data collection session, you need to create a new file:

1. Press DATA. **The File tab** appears:



   The GeoExplorer 3 data collection system automatically enters a name in the **File** field. You can change the name of the file, but for the purposes of this tutorial leave as is.

2. In the Dictionary field, check that the Waterstone data dictionary that you created in the office appears.

NOTE The latest data dictionary and the configuration file transferred to the GeoExplorer 3 automatically becomes the default.

NOTE The data dictionary you select when creating a data file is always associated with that file. Once the file is created, it is not possible to change its data dictionary.

3. All information in the form is correct, so press ENTER. The file is created and the New feature list appears:

The New feature list contains all the features in the data dictionary that you created in the office.

You are now ready to collect data.

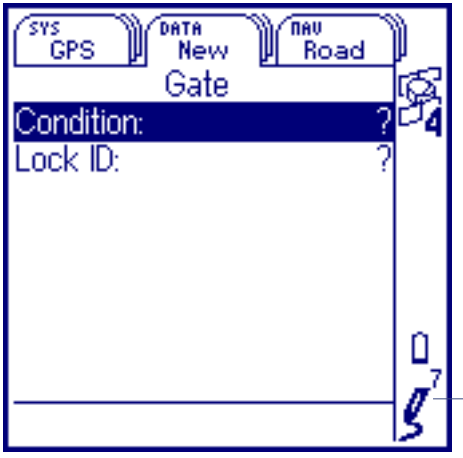
Collecting data

The GeoExplorer 3 data collection system is tracking satellites and you have created a new file, so you are ready to start collecting data. This part of the tutorial gives step-by-step instructions for the following tasks:

- **Collecting a point feature**
- **Collecting a line feature using the Later button**
- **Collecting a point feature using the Later button**
- **Collecting an area feature**

Collecting a point feature

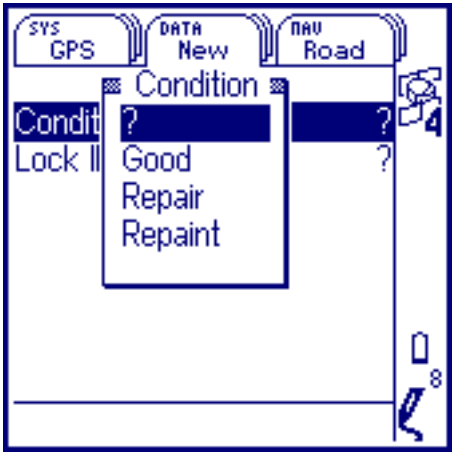
1. The first point feature that you want to collect is a gate. Gate is already highlighted in the New feature list, so press ENTER. The Gate form appears and the GeoExplorer 3 starts logging positions.



When the GeoExplorer 3 starts logging GPS positions the logging icon appears at the bottom of the status bar. The number above the icon indicates how many positions have been logged for the selected feature.

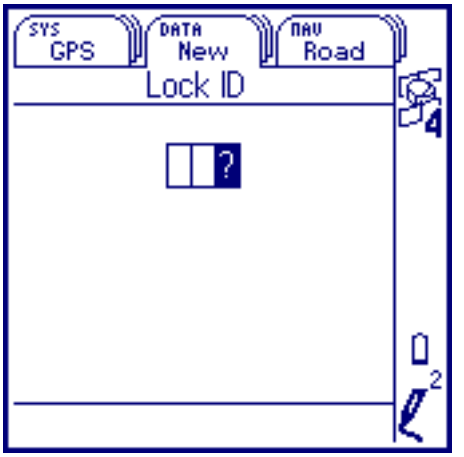
You can remain stationary at a point for a period of time. The GeoExplorer 3 will record a number of GPS positions during this time, based on the configured logging interval set when the feature was defined in the Data Dictionary Editor. After differential correction of the positions, they are averaged together (using Pathfinder Office) to produce an accurate position for the point feature.

2. Enter the Condition attribute for the gate. The Condition field is already highlighted, so press ENTER. A **Pop-up list** of values that was defined in the data dictionary appears:



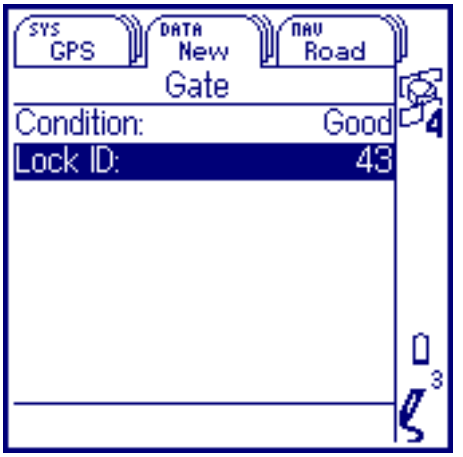
3. The condition of the gate looks good. Use the arrow keys to highlight Good, then press ENTER. The GeoExplorer 3 automatically goes to the next attribute in the form.

4. To enter the Lock ID number press ENTER. Lock ID is a numeric attribute, so a **Numeric entry** field appears:



The number on the lock is 43. By default, the rightmost cell is highlighted. Press △ to scroll the displayed number to 3. Press ◁ to move one cell to the left. Press △ to scroll the displayed number to 4. Press ENTER to accept the value for the Lock ID.

You have collected all the positions and attribute information needed for the gate.



5. To close the gate feature press CLOSE.

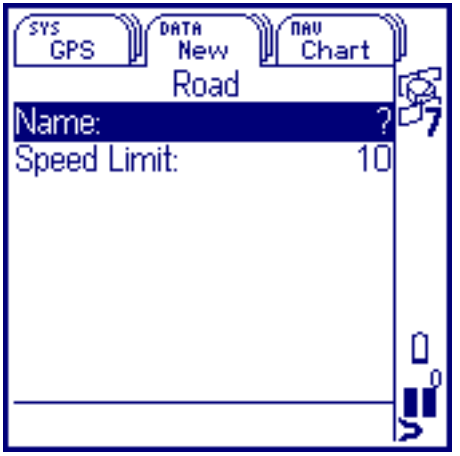
   The message **Feature stored** appears briefly at the bottom of the screen to confirm that you have saved the feature.

Collecting a line feature using the Later button

1. From the New feature list, press ▽ to highlight Road.

   You can record the attributes of the road without logging GPS positions.

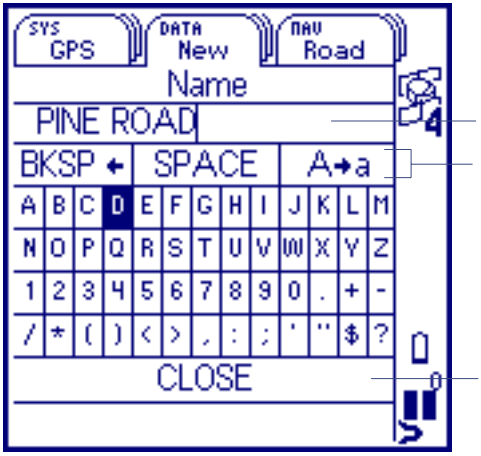
2. Press ▷ to highlight the Later button,and press ENTER. The Road form appears:



In order to record a line feature, travel along the line. As you do so, the GeoExplorer 3 will log a GPS position at the configured interval set when the feature was created in the Data Dictionary Editor. These positions are joined together to form a line.

NOTE When you use the Later button, a pause icon flashes over the logging icon to let you know that the GeoExplorer 3 is not logging GPS positions.

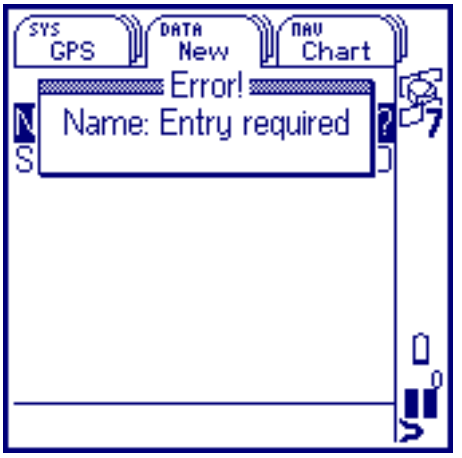
3. The Name field is already highlighted, so press ENTER. Use the **Text entry** field to type the name of the road, **PINE ROAD**:



Use the arrow keys on the GeoExplorer 3 handheld to highlight the letter P and then press ENTER. A “P” appears in the edit bar near the top of the screen. Continue selecting appropriate letters until you have completed the word PINE. Use the SPACE function (in the function bar) to add a space between words in the edit bar. To do this, highlight SPACE and press ENTER. Then enter the word ROAD.

4. When finished, press CLOSE. Alternatively, highlight CLOSE (at the bottom of the screen) and press ENTER.

When you created the Name attribute in the office, you specified that it was required. So if you attempt to close the road feature without entering a name, the GeoExplorer 3 warns you that it is required and will not let you go any further:



To clear an “Error” message from the screen, press CLOSE.

5. The speed limit for Pine Road. is 10 mph. When you created the data dictionary in the office you set 10 mph as the default, so in this case you do not need to change the value.

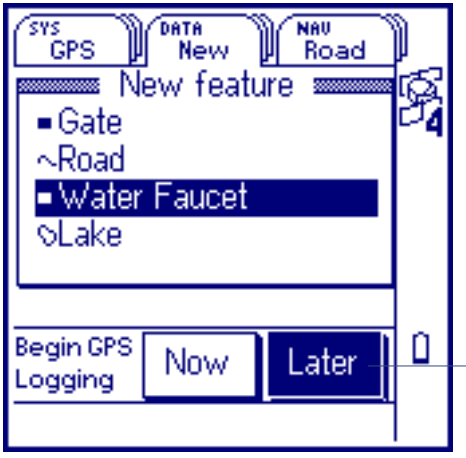
NOTE If you do need to change the value, select the Speed Limit field. A pop-up list appears. From the list select the correct value.

6. Press LOG to begin logging GPS positions for the road feature.
7. When you reach the end of the road, press CLOSE to close the road feature.

Collecting a point feature using the Later button

The next feature you are going to collect is a water faucet. You have not yet reached the water faucet, but you can enter the sample test tube and the date while on the way to it.

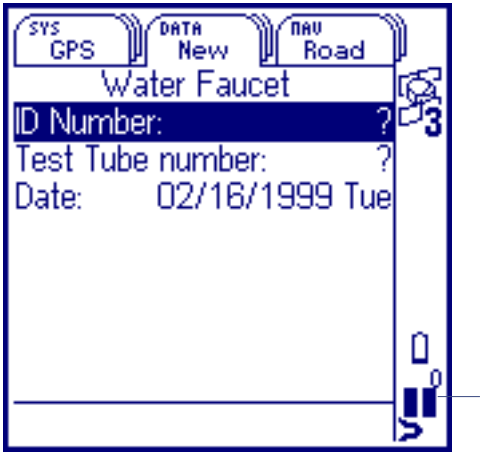
1. From the New feature list, press ▽ to highlight Water Faucet



Use the Later button to start recording the attributes for a feature before you actually get to it.

2. The Later button is already highlighted, so press ENTER.

3. The Water Faucet form appears:



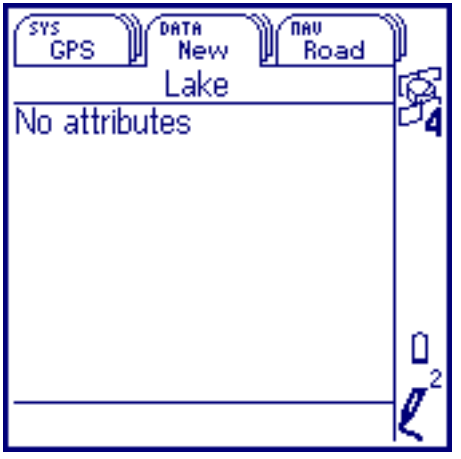
NOTE When you use the Later button, a pause icon flashes over the logging icon to let you know that GeoExplorer 3 is not logging GPS positions.

4. Enter the attributes for the water faucet now, so that when you arrive at the feature, you can start logging GPS positions.
5. Select the Test Tube number field and enter **132**. For more information see **Numeric entry**.
6. The date attribute automatically appears. This is because you set the date to auto-generate when you created it in the office. If you need to you can edit the value select the Date field. A numeric entry field appears.
7. When you reach the water faucet feature, press LOG. This is near the bottom of the handheld. The GeoExplorer 3 starts logging GPS positions for this feature and the pause icon disappears.
8. Select the ID Number field and enter **15**.
9. Record sufficient positions, then press CLOSE to close the feature and store it.

Collecting an area feature

1. From the New feature list, press ▽ to highlight Lake feature.
2. Press ◁ to highlight the Now button, and press ENTER.

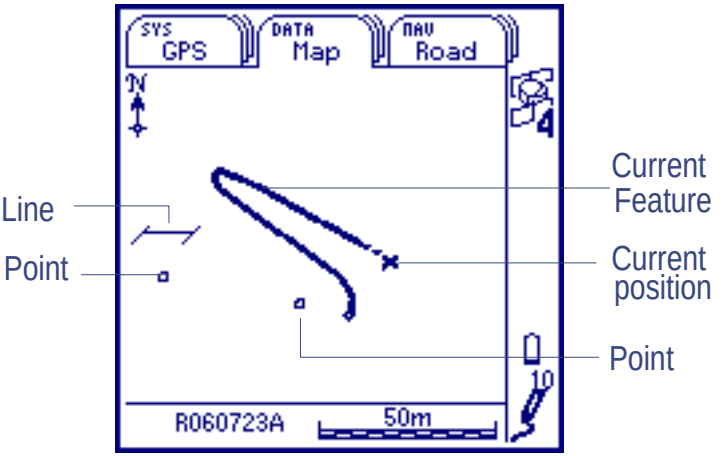
   The GeoExplorer 3 starts to log positions. When you created this feature in the office, no attributes were assigned.



In order to record an area feature, you travel around the perimeter of the area. As you do so, the GeoExplorer 3 will log a GPS position at the configured interval set when the feature was created in the Data Dictionary Editor. These positions are joined together to form the perimeter of the area.

The first and last GPS positions are joined together to close the area, so there is no need to return to the start point.

3. You can view the DATA map while collecting features. To do this, press DATA until the Map tab is active. The features that you collected are displayed on the map, along with the lake perimeter that you are currently collecting.



You can view the map at different scales. To do this, press OPTION. Select the Zoom in/Zoom out option.

NOTE Depending on the scale you are using to view your map, it may look different to the map shown above.

4. You can pause logging if required.

   For example, if you are driving around the perimeter of the lake and you want to stop and examine a picnic shelter some distance from the lake, you would stop logging positions for the lake boundary. To do this, press LOG. The GeoExplorer 3 stops logging positions and a pause icon flashes over of the logging icon. To continue collecting the lake feature, press LOG again to resume logging. The pause icon disappears.

   For more information see **Pause and resume logging**.

5. Press DATA to go back to the New tab. The Lake form is still active and the GeoExplorer 3 is still logging positions for the lake.

6. When you have driven around the perimeter of the lake, press CLOSE to close the feature.

TIP There are several advanced data collecting techniques that make a data collection session more efficient. For more information see **Advanced data collection**.

Closing a file

When the data collection session is completed, turn off the GeoExplorer 3 handheld. This automatically closes the data file.

To turn off the GeoExplorer 3 handheld:

- Press ⏻.

  The data file is closed, and the handheld is turned off.

TIP To close the data file that you are using and start a new file, press CLOSE until the File tab appears.

Processing the data

Back from your data collection session in Waterstone National Park, use the Pathfinder Office software to process the data collected and transfer it to the GIS.

This part of the tutorial shows you how to transfer, process, and view the data. Topics are:

- **Transferring data**
- **Differentially correcting data**
- **Viewing data**
- **Exporting data to a GIS**

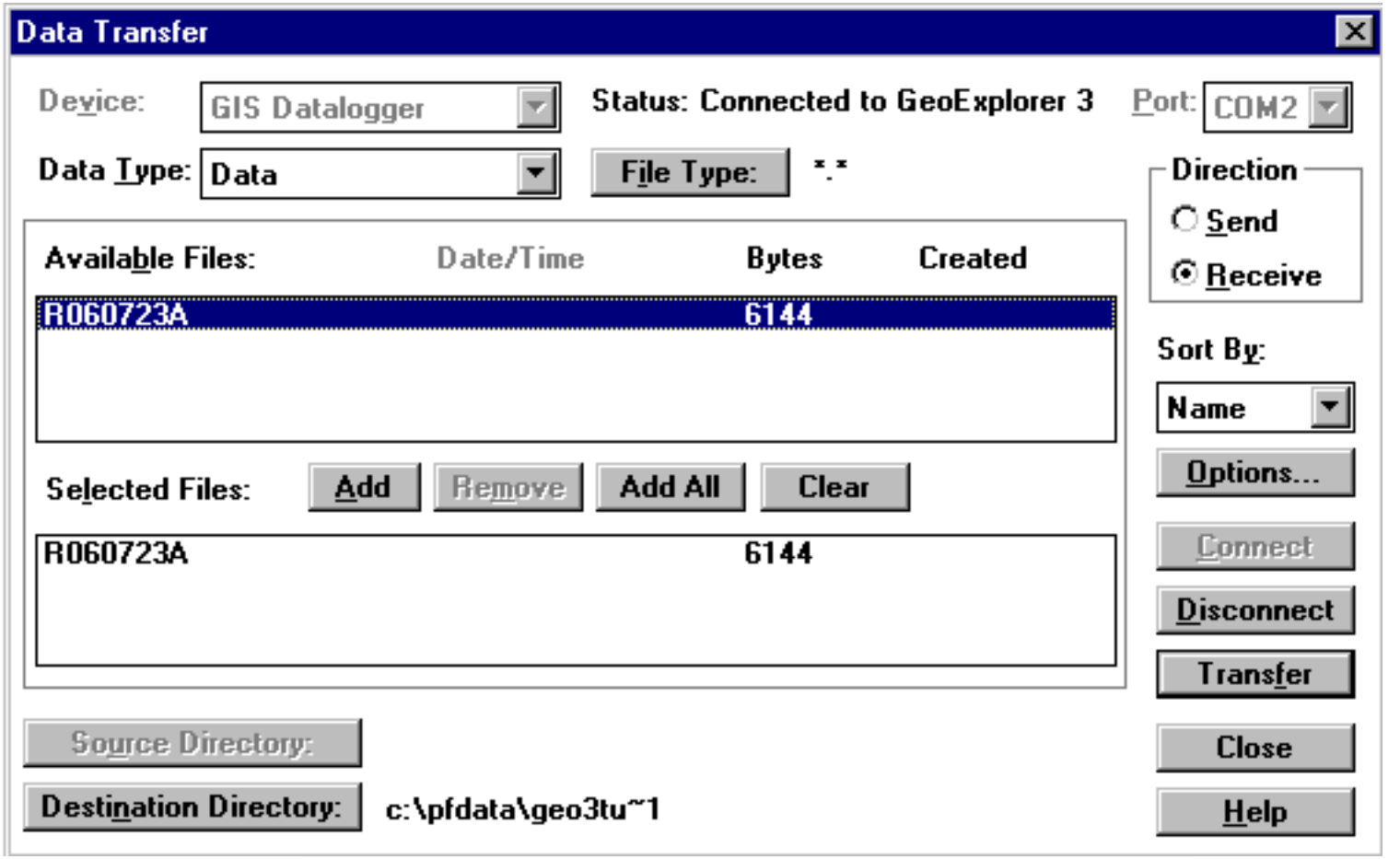
Transferring data

You need to transfer the data collected in the field, from the GeoExplorer 3 to the office computer. Transferring data from the GeoExplorer 3 data collection system to the office computer is easy.

1. In Pathfinder Office, start the Data Transfer utility by selecting Utilities / Data Transfer.

   Pathfinder Office tries to connect to the GeoExplorer 3.

2. Select one or more files to be transferred in the Available Files field. Highlight the filename and click **Add** to move them to the Selected files list:



NOTE The files that appear are the current files on the data collector.

In the Direction group (on the right), the Receive option will be automatically selected.

3. The Destination Directory that the files are to be transferred to will default to the current project folder.
4. Click **Transfer**. The files are transferred from the GeoExplorer 3.
5. Click **Close** to close the Data Transfer dialog.

NOTE Use the Data Transfer utility to transfer waypoint or **almanac** files.

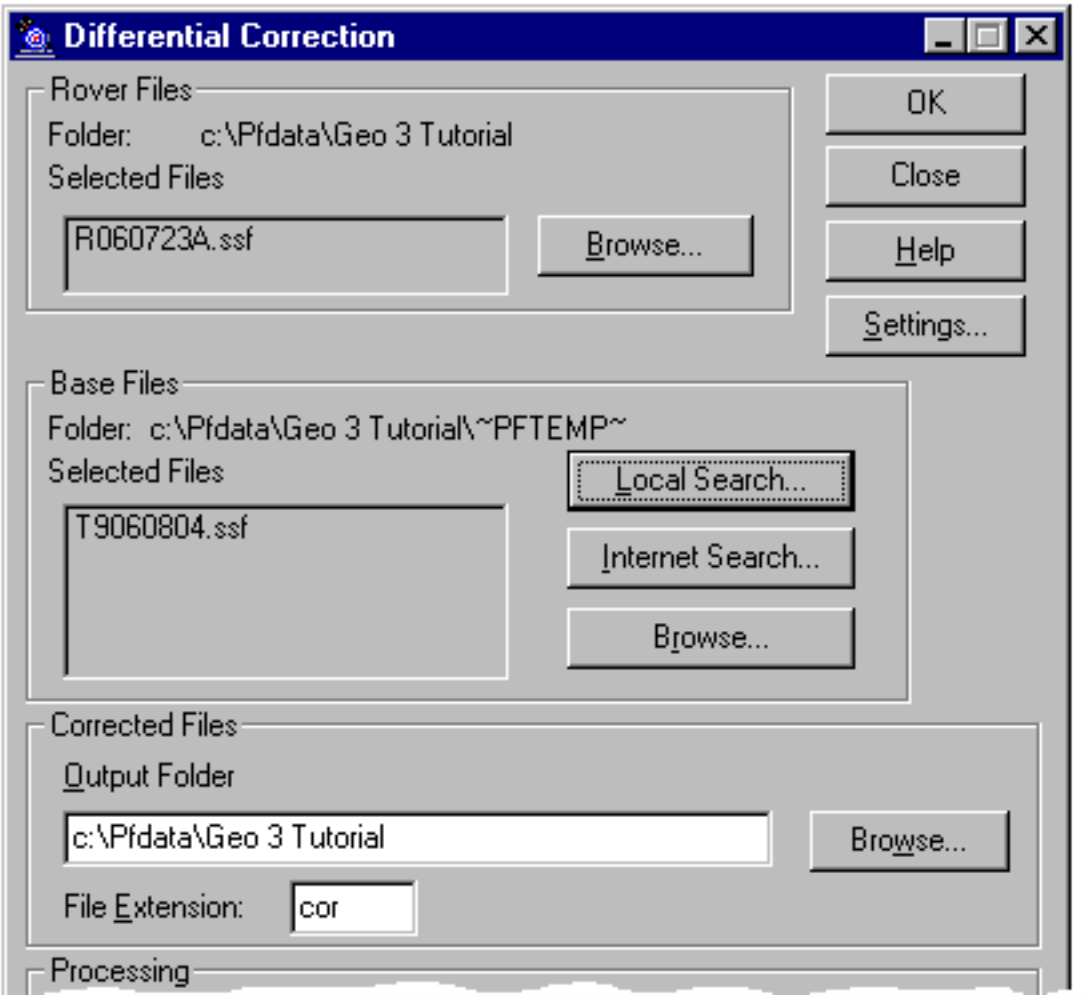
For more information refer to the Pathfinder Office online Help.

Differentially correcting data

The data collected by GPS receivers is subject to errors, including small satellite clock errors and larger errors intentionally introduced into the system by the U.S. Department of Defense. The vast majority of these errors can be removed from the data by differential correction. Postprocessed **real-time differential GPS** correction improves the accuracy of GPS positions from approximately 100 m to the specified accuracy of the receiver.

1. In Pathfinder Office, start the Differential Correction utility by selecting Utilities / Differential Correction. The last file(s) transferred from the GeoExplorer 3 appears in the Selected Files field.

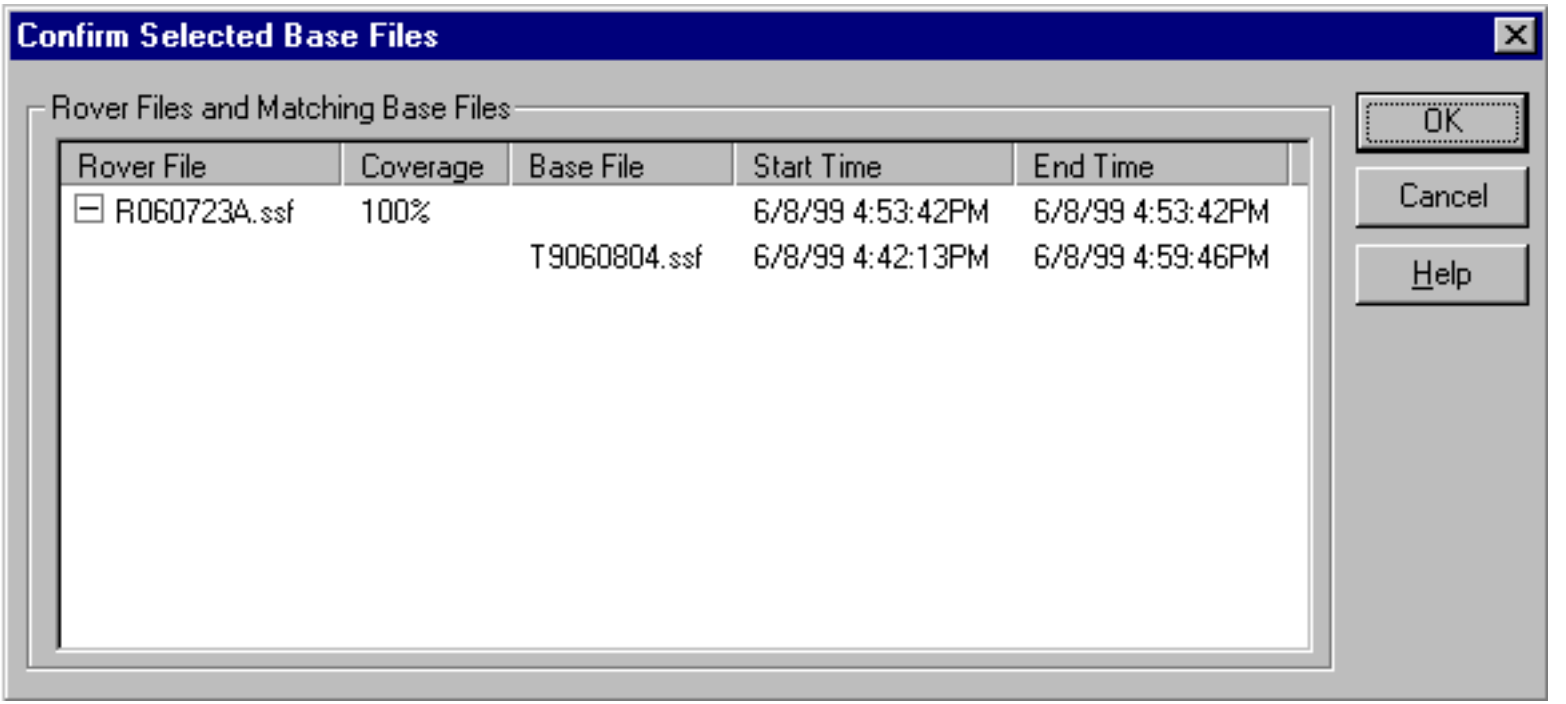
The following dialog apears:



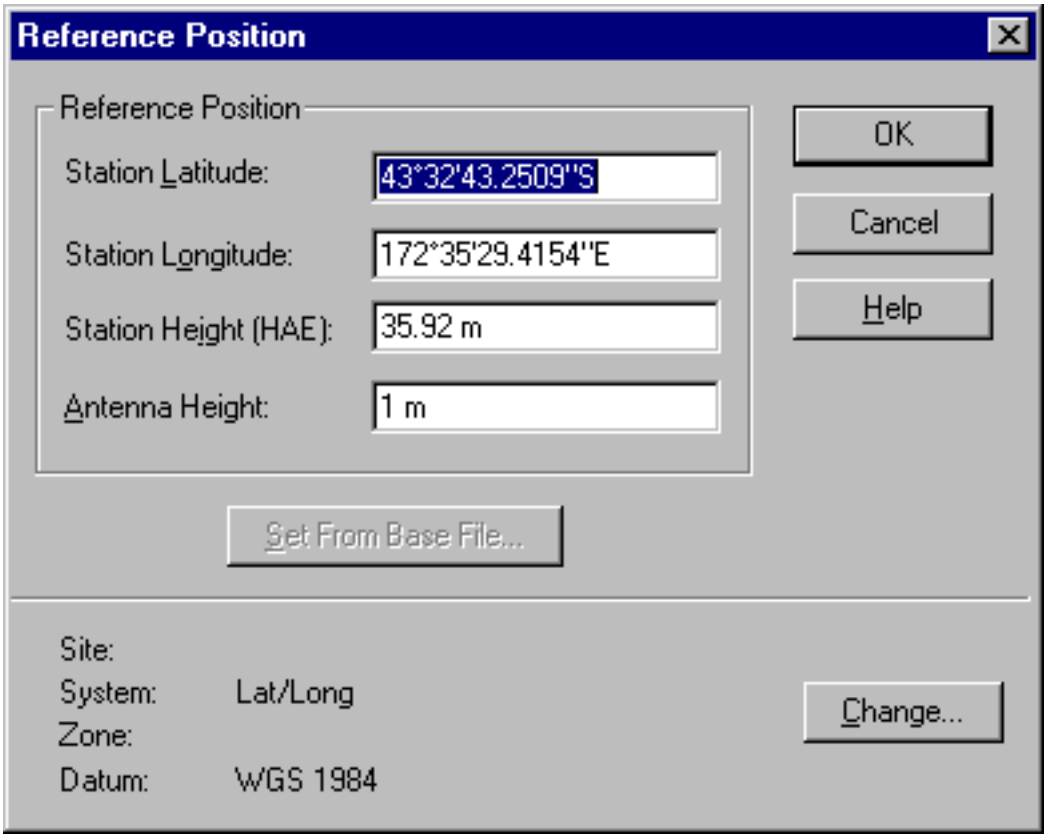
More...

2. Specify the location of your base files.

   Depending on the source of base files, there are three options available: Local Search for base files, Internet Search for base files, or Browse. By default, base files are stored in the current project's base file folder on your local drive. If you need to change the Folder path for the Local Search for base files option, click **Browse**. The Confirm Selected Base Files dialog appears:

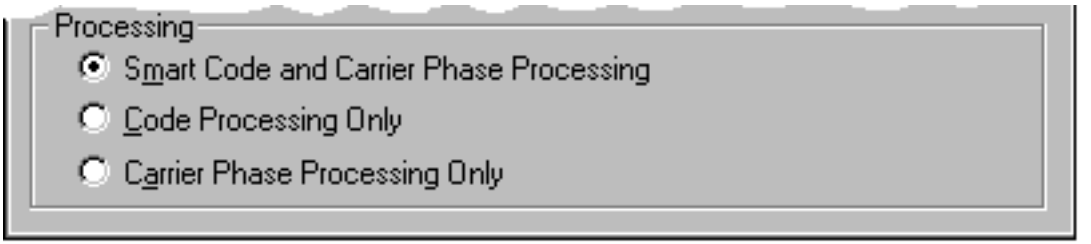


3. Use the Confirm Selected Base Files dialog to make sure the selected base files provide coverage for the rover files. Click **OK**. The Reference Position dialog appears:



4. Click **OK** to confirm the reference position.

5. Specify the output folder. By default, the output folder is the current project folder.
6. Select a processing option.



   By default, Smart Code and Carrier Phase Processing is selected.
7. Click **OK** to differentially correct the selected files.
8. The Differential Completed dialog details the results of the differential correction. Click **OK** to close this dialog.

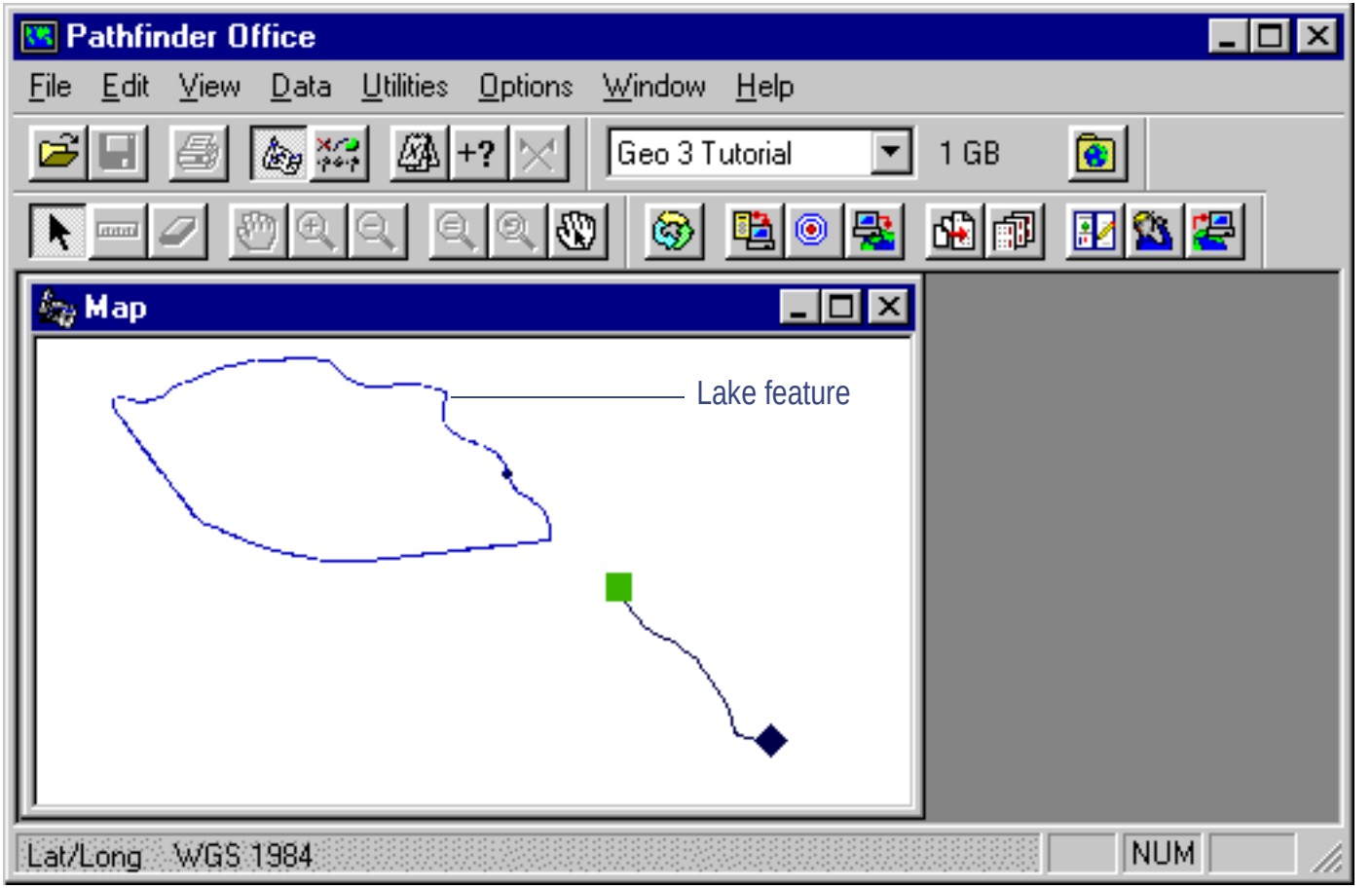
Viewing data

When the data has been transferred and differentially corrected you can display, edit, and plot it. The Pathfinder Office Map window is the best way to view field data. Use it to make graphical queries and measurements on the collected data. You can specify the colors, symbols, and line styles for each feature. The Map window provides an easy way to verify the integrity of the field data.

To view the data:

1. From the Pathfinder Office menu bar select File / Open. Select the data file(s) that you want to view. The current project folder is the default path (C:\Pfdata\Geo 3 Tutorial).

2. From the Pathfinder Office menu bar, select View / Map:



The Map window displays the selected file.

3. To display the attributes of any feature on the map, double-click the feature. The Feature Properties dialog appears. It provides attribute information about the selected feature.
4. Change the color of the Lake feature. Right-click the Lake feature on the map. From the shortcut menu select Lake Layer Style. The Lake style dialog appears.Use this dialog to change the color of the lake area to blue.

5. You can also measure between positions and features, and compute areas. For example, you can compute the distance between the Road feature and the Lake feature. To do this, select Data / Measure from the Pathfinder Office menu bar. The cursor becomes a ruler when the Map window is displayed. Click a point on the Road feature. Then click a point on the Lake feature. The distance between the two points is computed and displayed at the bottom of the screen.

For more information about the Pathfinder Office Map window display, refer to the View menu topic in the Pathfinder Office online Help.

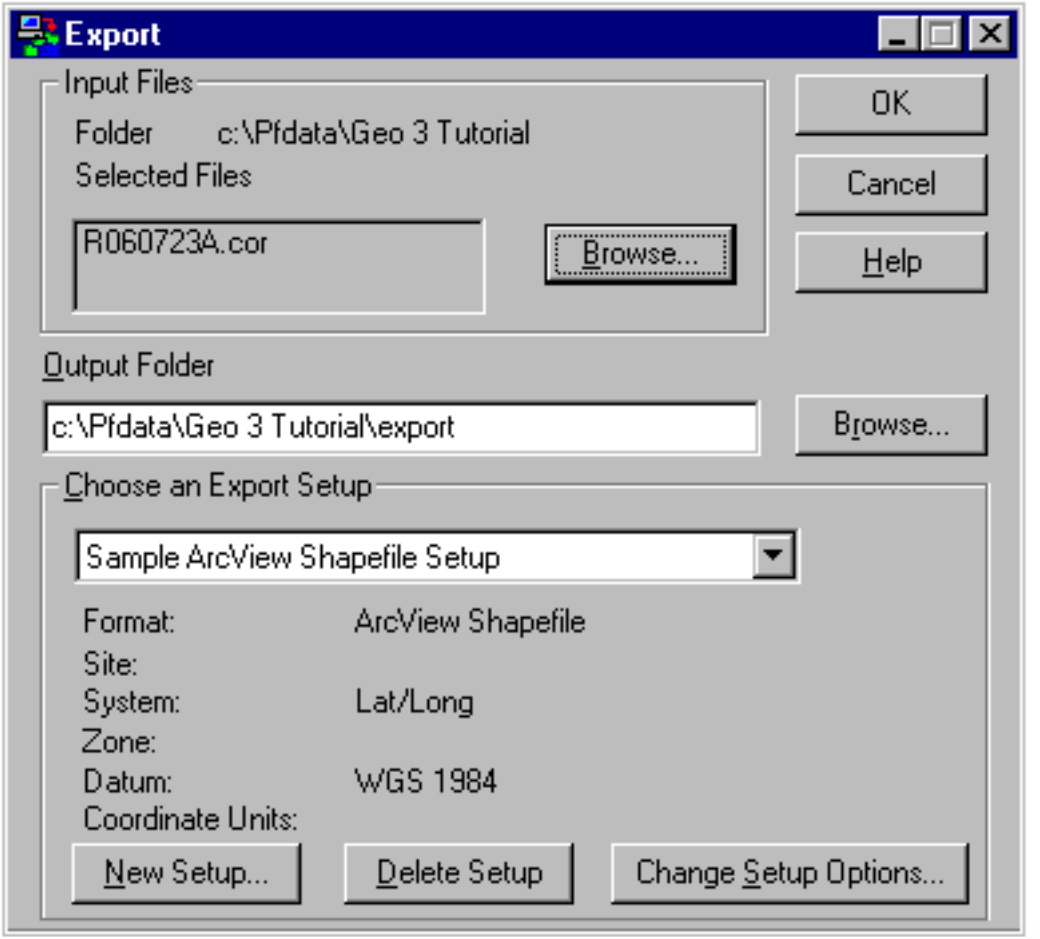
NOTE When using the Map window in Pathfinder Office to edit data, remember to export the data back to your GIS.

Exporting data to a GIS

The Export Utility in Pathfinder Office converts **.SSF file** format files into a format that can be read by a GIS or CAD system. It lets you export point, line, and area features, their attributes, raw GPS positions, and velocity records to a variety of other formats.

To export data to a GIS:

1. In Pathfinder Office, start the Export utility by selecting Utilities / Export:



More...

By default, the last file(s) differentially corrected appear(s) in the Selected Files field.

2. Select the output folder in the current project. By default, this is the export folder in the current project.
3. Select the Export setup.
4. Click **OK** to export the selected file(s) to the specified GIS format.
5. The Export Completed dialog details the results of the export. Click Close to close this dialog.
6. The file is now in the format required by your GIS. You can now open it in your GIS.

NOTE The Batch Processor utility increases productivity by letting you automate repetitive tasks that you do when you return to the office. When you can come back from the field, simply place the GeoExplorer 3 handheld in the **GeoExplorer 3 Support Module**. The Connection Manager utility automatically recognizes that the GeoExplorer 3 is in the support module and runs the Batch Processor. Set up the Batch Processor to meet your data requirements.

For more information about these utilities refer to the Pathfinder Office online Help.

Preparing for update

NOTE Data update, using uploaded .ssf files, is not available with the **GeoExplorer 3c edition**.

A month has passed and it is necessary to re-sample the water faucets in Waterstone National Park. A different Park Ranger is going to be doing this. The GeoExplorer 3 data collection system and a real-time source will be used to navigate to each faucet, and the Waterstone data dictionary will be used to verify and update the attributes for those faucets. This part of the tutorial gives step-by-step instructions that should be performed when preparing to take the GeoExplorer 3 and the Beacon-on-a-Belt (BoB) receiver into the field to update data. Topics are:

- **Using real-time differential corrections**
- **Checking the memory**
- **Deleting files**
- **Transferring GIS data**
- **Locking the configuration and tasks**
- **Transferring a configuration file**
- **Checking the equipment before going into the field**

Using real-time differential corrections

To update existing data, back in the field, you can navigate to features and waypoints using the Road, Compass, or Chart tabs. Using **RTCM** real-time corrections you can accurately navigate to any specific location.

In this tutorial, you use the **Beacon-on-a-Belt™ (BoB) receiver** real-time source to receive RTCM and transmit the information to the GeoExplorer 3. The GeoExplorer 3 then applies the differential corrections to GPS positions computed in the field. This gives greater accuracy and saves postprocessing time in the office.

By default, the GeoExplorer 3 data collection system is configured to use RTCM. If necessary, you can change the **Real-time** settings using the GeoExplorer 3 (in the field) or the Configuration Manager (in the office).

NOTE If you do not have the Beacon-on-a-Belt (BoB) receiver, you can use an alternative real-time differential correction source.

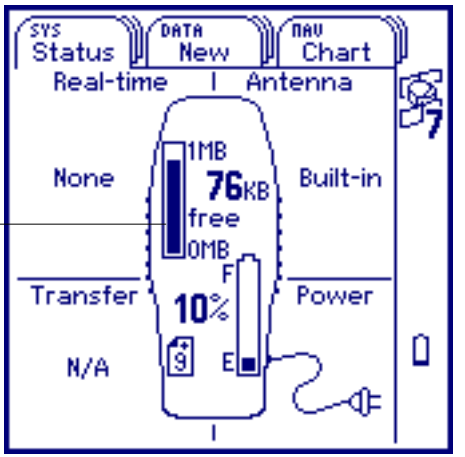
NOTE If you do not use real-time differential corrections in the field, the accuracy of the GeoExplorer 3 data collection system is subject to **selective availability** (S/A) errors of up to 100 m 2DRMS.

Checking the memory

Before using the GeoExplorer 3 to verify and update existing GIS data in the field, transfer these data files. Before transferring them to the GeoExplorer 3, check the memory level to make sure that sufficient space is available. If necessary, delete old files to make space for the GIS data.

To check the memory levels using the Status tab:

1. Press ⏻ to turn on the GeoExplorer 3 handheld.
2. Press SYS until the Status tab is active:



In this case there is not much remaining memory. For this project, you need to delete some files to create space before uploading the GIS. See **Deleting files**.

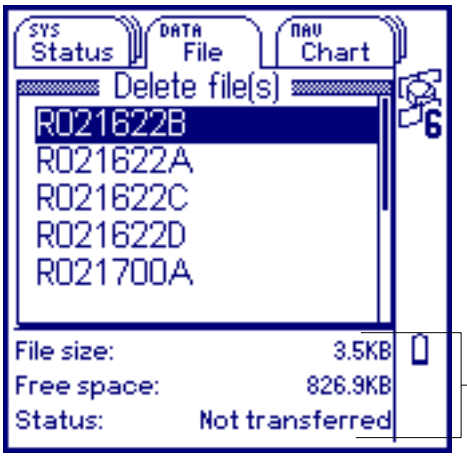
NOTE When the memory level is low, the memory icon flashes in the **Status bar**.

Deleting files

Deleting files creates space on the GeoExplorer 3 data collection system so that you can transfer data and collect new data. The amount of space required depends on the project.

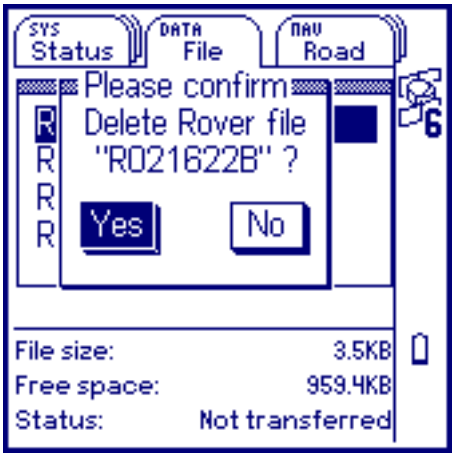
To delete files:

1. Press DATA. The File tab appears.
2. Press OPTION and select Delete file(s). The Delete file(s) list appears:



The message box displays information about the highlighted file in the list and shows the free space on the GeoExplorer 3 data collection system.

3. Use the Delete file(s) list to select the file(s) you want to delete and press ENTER. You are prompted to confirm deletion. Select Yes to delete the file:



4. Press CLOSE to close the **Delete file(s)** list.

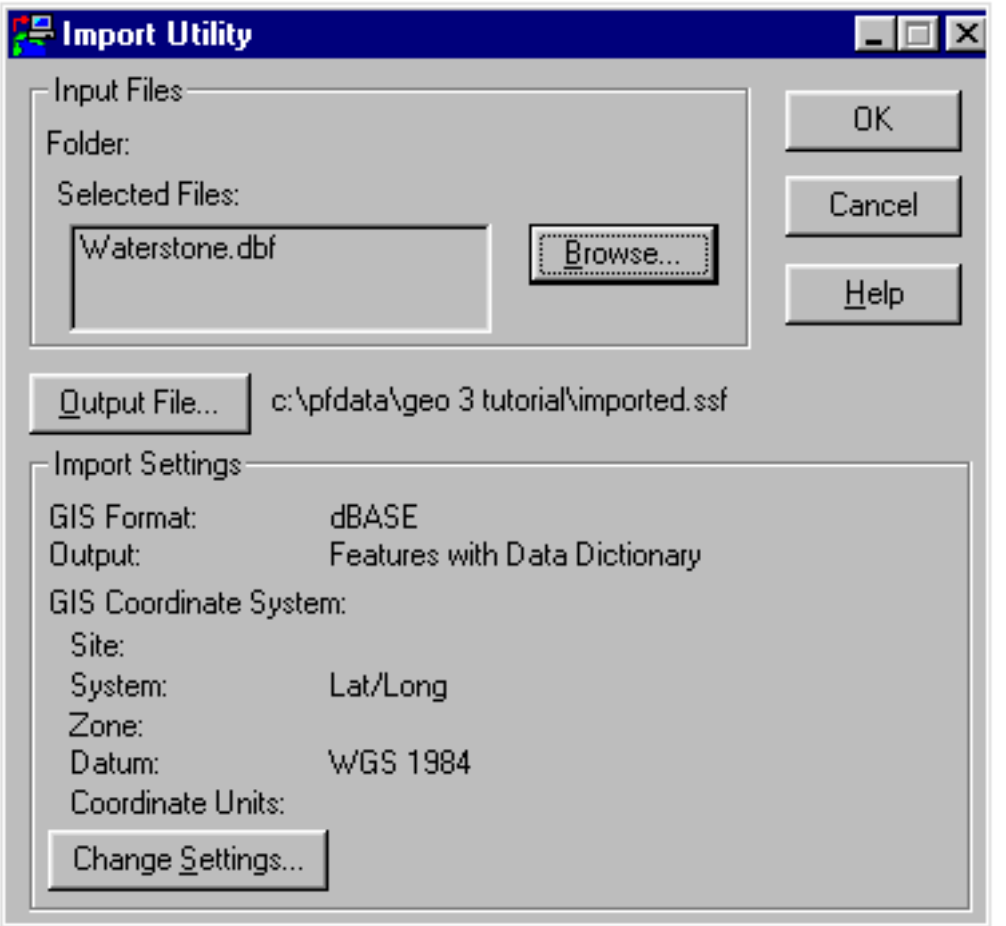
NOTE If the selected data file has not been transferred to the office computer, the Please confirm message appears: **`File 'x' has not been transferred to the PC: Delete anyway?`**. Select Yes to delete the file. Select No to cancel the deletion.

Transferring GIS data

Before going into the field for a data update session, transfer the required information from the GIS to the GeoExplorer 3 data collection system. The Import utility in Pathfinder Office converts data from a GIS data format into the **.SSF file** format required by the GeoExplorer 3. The Data Transfer utility in Pathfinder Office lets you efficiently transfer data between the office computer and the GeoExplorer 3. This part of the tutorial outlines how to transfer GIS data to the GeoExplorer 3 data collection system.

To convert GIS data to **.SSF** format:

1. Start the Import utility. From the Pathfinder Office menu bar select Utilities / Other / Import:



More...

2. Click **Browse** and select the input file(s). By default, the path specified for the output file is the current project folder.
3. Click **Output File** to change the output file.
4. Make sure that all import settings are correct. Click **Change Settings** to make changes.
5. Click **OK** to import the file(s).

For more information refer to the Pathfinder Office online Help.

Transferring GIS data to the GeoExplorer 3 data collection system

NOTE Data update, using uploaded .ssf files, is not available with the **GeoExplorer 3c edition**.

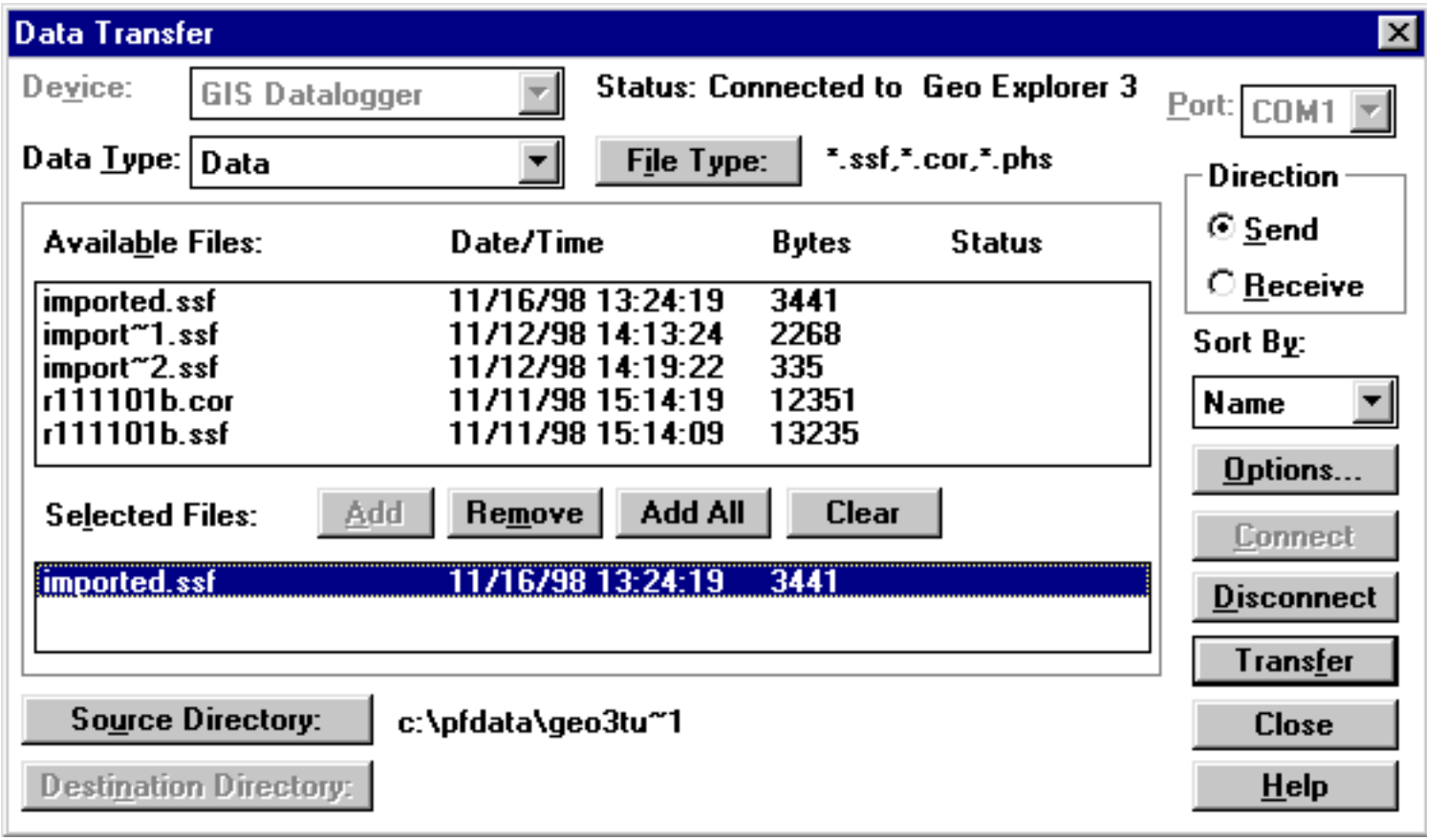
Once the data from the GIS is imported into the Pathfinder Office software, use the Data Transfer utility to transfer it to the GeoExplorer 3.

NOTE When you transfer files from Pathfinder Office to the GeoExplorer 3, the associated data dictionary is automatically transferred with the file.

To transfer data files to the GeoExplorer 3 data collection system:

1. Start the Data Transfer Utility. From the Pathfinder Office menu bar select Utilities / Data Transfer.
2. In the Data Type field, select Data.
3. Select the source folder where the files are located. By default, the source folder for sending files is the last folder used to transfer a file. Click **Source Directory** to change the source folder if necessary.
4. Select one or more files to be transferred. In the Available Files field highlight the filename and click **Add** to move them to the Selected Files list.

5. In the Direction group (on the right) select the Send option.



6. Click **Transfer**. All files in the Selected Files field are transferred. Now transfer the configuration file.

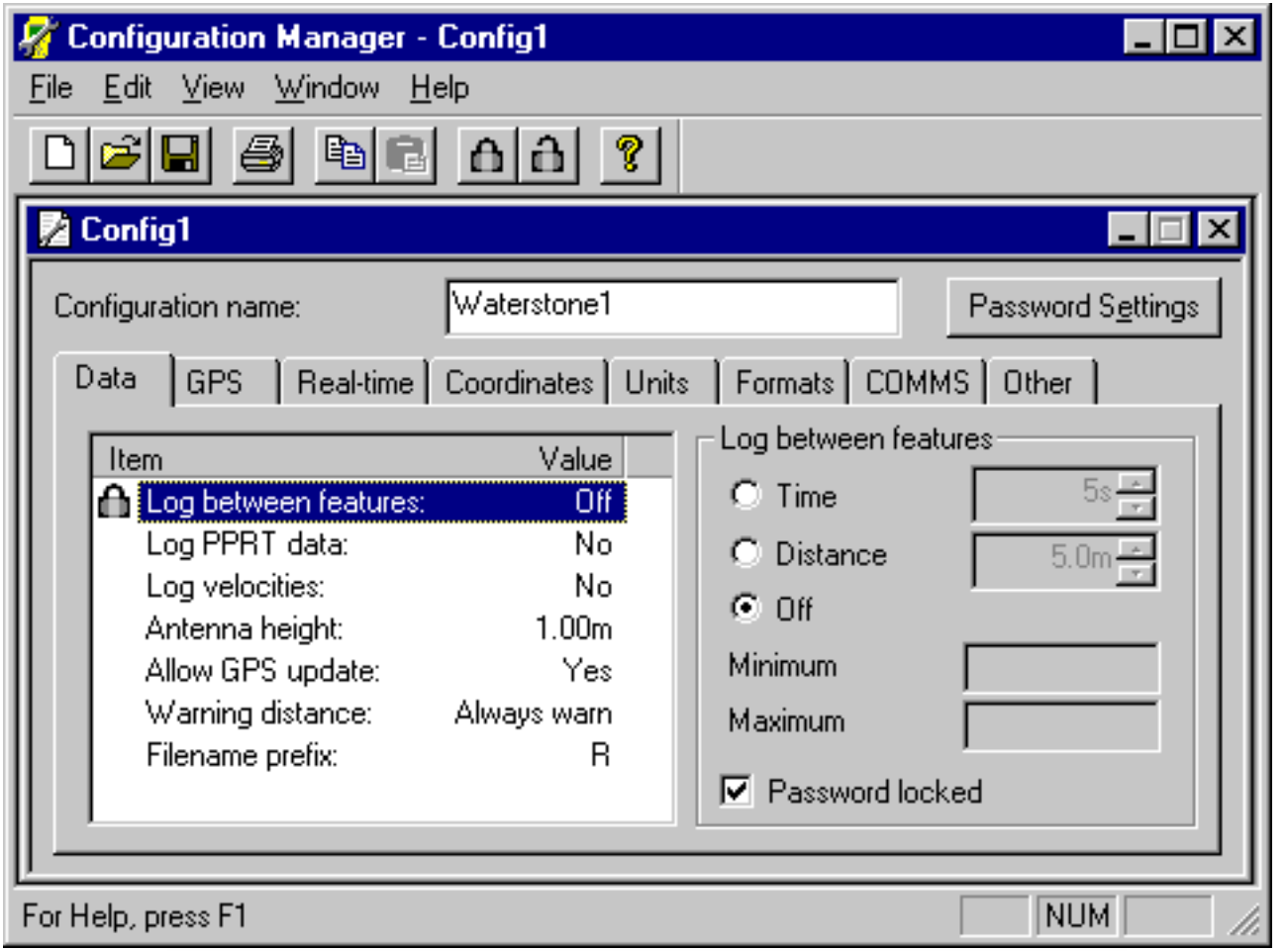
Locking the configuration and tasks

When you set up a configuration in the office, you may want to protect it to make sure that it is not changed in the field. This makes sure that the data collected meets your specifications. You can also protect certain tasks to prevent files from being deleted or changed in the field. Use the Configuration Manager in the Pathfinder Office software to apply a password to the configuration and specific tasks.

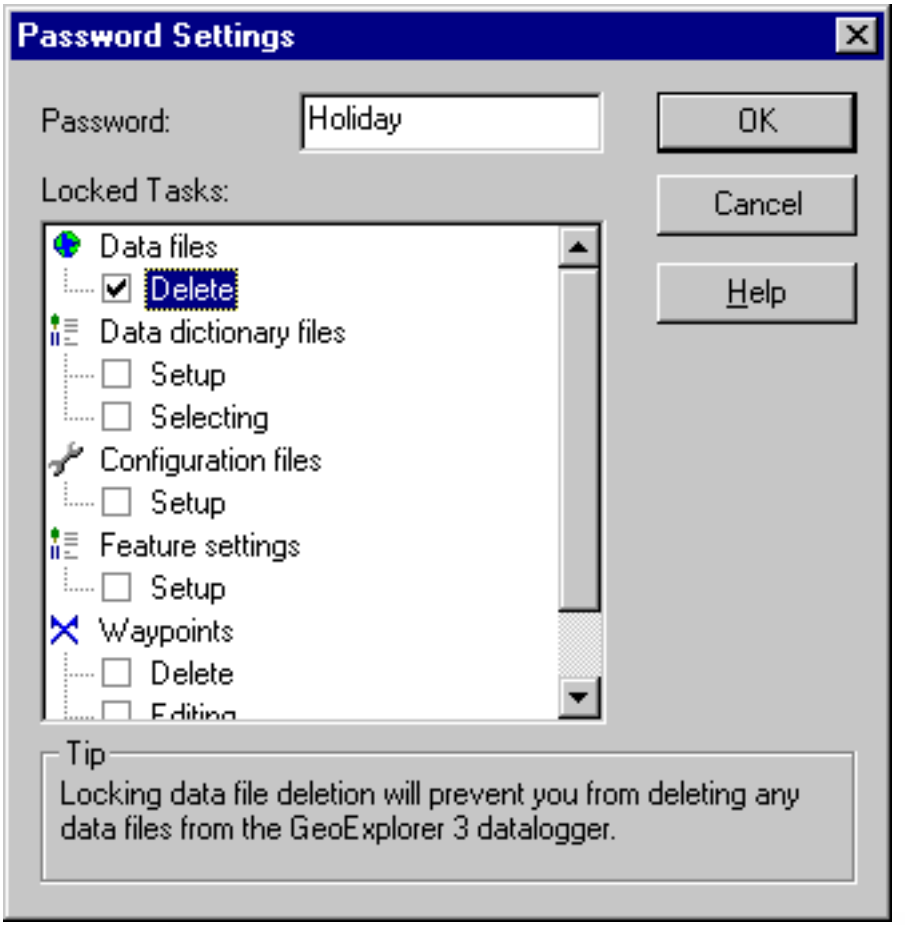
This month you will be unable to go and collect the water samples personally. A member of your field crew will be collecting them. You can lock the GeoExplorer 3 data collection system so that data files cannot be deleted. To do this:

1. Start the Configuration Manager by selecting Utilities / Other / Configuration Manager.
2. Select File / New. A configuration dialog appears.
3. In the Configuration field type **`Waterstone1`**.
4. Make sure the Data tab is selected. Highlight the Log between features field. You do not need to log any GPS data between features because such data is not required for this project. Lock this field so that no GPS data is collected unless a feature is being recorded.

5. Select the Password locked check box (at the bottom of the dialog). This locks the Log between features field.



6. Click **Password Settings**. The Password Settings dialog appears.
7. Select the Date files: Delete check box and type the password in the Password field:



More...

8. Click **OK** to accept the password and lock the selected task(s).

NOTE You will need this password to delete any data files on the GeoExplorer 3 once in the field.

9. Save the new Waterstone configuration. You can add the configuration file to the same folder as the data dictionary files. (For example, C:\Pfdata\Geo 3 Tutorial).
10. Select File / Exit to close the Configuration Manager.

For more information refer to the Pathfinder Office online Help.

TIP Locking and unlocking is useful when you do not want certain settings to be changed. If you create a configuration for a certain job and do not want it altered, lock it by applying a password.

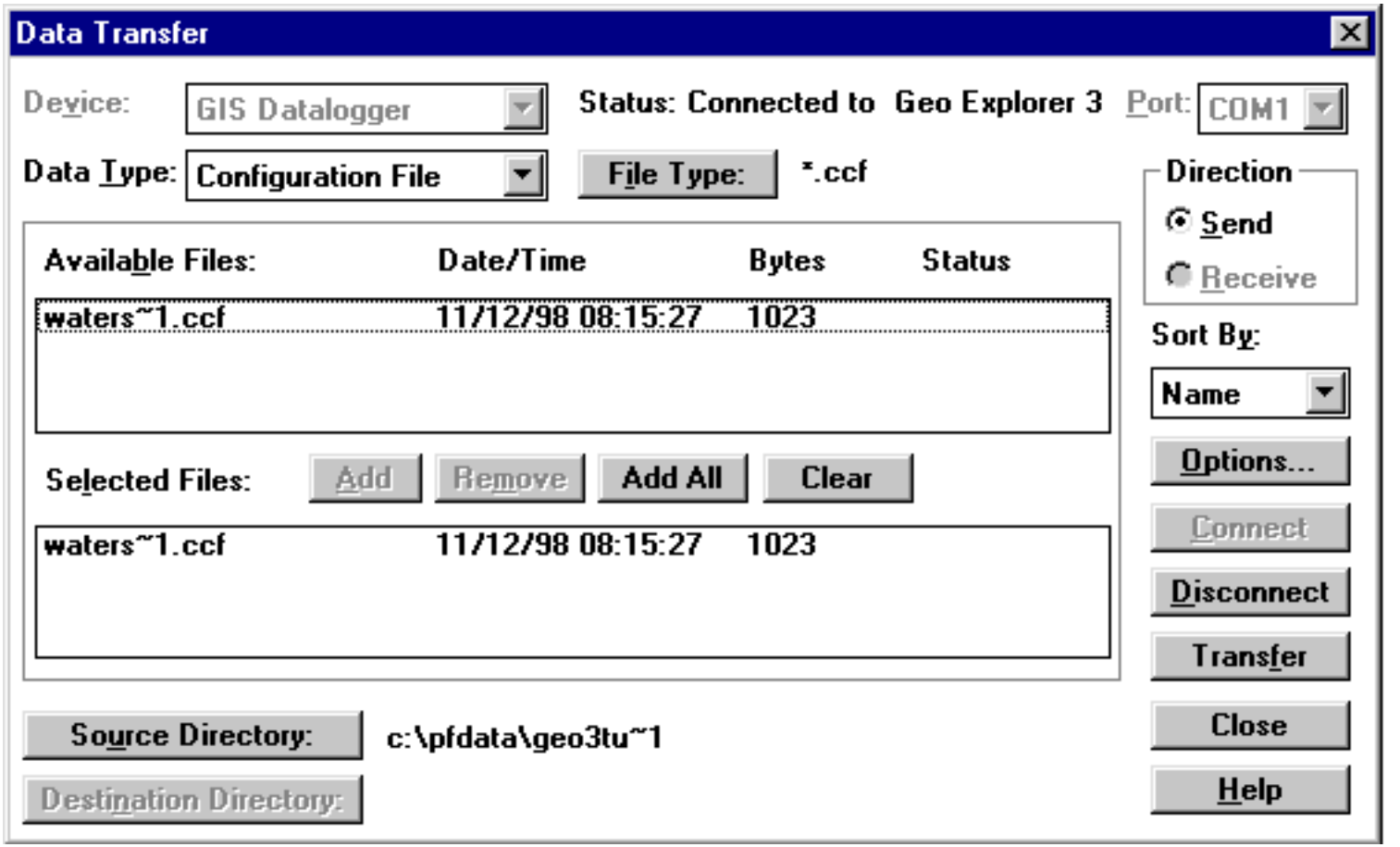
Transferring a configuration file

When you create a new configuration or lock tasks, you need to transfer the new configuration to the GeoExplorer 3 using the Data Transfer utility. When you transfer the configuration file, you can also transfer the files that are associated with it.

To transfer the configuration file to the GeoExplorer 3 data collection system:

1. In Pathfinder Office, start the Data Transfer Utility by selecting Utilities / Data Transfer.
2. In the Data Type field select Configuration File.
3. Select the source folder (the folder where the files are located). By default, this is the last folder that was used to transfer a configuration file. Click **Source Directory** to change the source folder if necessary.
4. Select the configuration file to be transferred. Highlight the filename in the Available Files field and click **Add** to move it to the Selected Files list.

5. When Configuration File is selected in the Data Type field, the Send option is automatically selected in the Direction group (on the right).



6. Click **Transfer**. The files are transferred to the GeoExplorer 3
7. Click **Close** to close the Data Transfer dialog.

For more information refer to the Pathfinder Office online Help.

Checking the equipment before going into the field

Before going into the field, check that you have the necessary equipment and that it is working correctly.

For the previous tasks the GeoExplorer 3 has been in the support module. You can check if the internal power source is fully charged without taking the handheld out of the support module. If the GeoExplorer 3 is off, use the Standby mode. If the GeoExplorer 3 is on, use the **Status bar**.

Check that the real-time source is fully charged and that you have the BoB receiver or the cable to connect the real-time source to the GeoExplorer 3 handheld if necessary.

NOTE Turn off the GeoExplorer 3 data collection system before going to the data collection start point. This saves battery power.

Data update

NOTE Data update, using uploaded .ssf files, is not available with the **GeoExplorer 3c edition**.

Your supervisor has sent you to Waterstone National Park to collect the monthly water samples. The configuration and data files have been transferred onto the GeoExplorer 3 data collection system for you, but before starting the data update session, there are some tasks that you need to complete. You can then use the GeoExplorer 3 and the real-time source to navigate back to the water faucets and update the attributes.

This part of the tutorial contains step-by-step instructions for updating existing GIS data, using real-time corrections, and navigating. Topics are:

- **Initial tasks**
- **Navigating to and updating features**
- **Creating a waypoint**
- **Closing the file**

Initial tasks

Before starting a real-time data update session, complete the following tasks:

- **Checking the GPS status**
- **Configuring the GPS slider bar**
- **Checking the real-time status**

Checking the GPS status

The GeoExplorer 3 needs a minimum of four satellites, with good geometry, in order to compute a 3D GPS position. When you turn on the GeoExplorer 3 data collection system, it automatically starts to track visible satellites and to calculate its current position. Use the satellite icon in the **Status bar** to check if the GeoExplorer 3 is computing satellite positions. If the satellite icon and the number below it are not flashing, the GeoExplorer 3 is computing GPS positions.

If the satellite geometry is poor or there are too few satellites available to compute GPS positions, adjust the GPS slider bar or wait until conditions are more favorable.

NOTE GPS positions are three-dimensional (surface, location, and height). The GeoExplorer 3 can compute a 2D GPS position with only three satellites, however, you must supply an accurate height.

Configuring the GPS slider bar

There are some critical settings in the GeoExplorer 3 data collection system that you should configure before collecting data (for example, the GPS settings and logging intervals). Configure these before leaving the office, or in the field. You can also set other (non-critical) settings to suit your application or preferences.

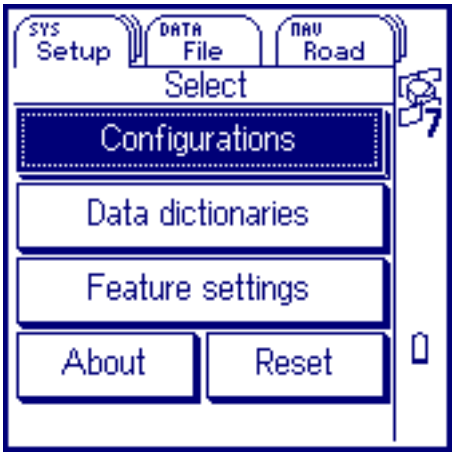
The following steps show you how to configure the GPS slider bar to best suit the environment of Waterstone National Park.

Waterstone National Park is mostly forest area. This type of environment has several areas where the tree canopy can obstruct the view of the sky. Therefore, adjust the GPS slider bar to allow more positions to be recorded. Some of the positions recorded may have lower quality, but recording more positions makes sure that there are fewer gaps in the data collected.

NOTE By default, the GPS slider bar is set at the highest setting. When you adjust the GPS slider bar, you can obtain positions in less favorable conditions but they are less precise.

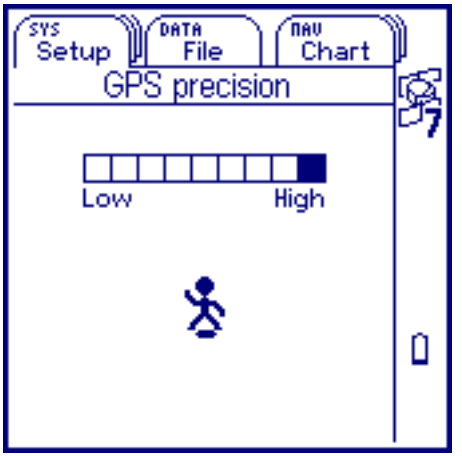
To configure the GPS slider bar:

1. Press SYS until the Setup tab is active.



2. Highlight Configurations and press ENTER. The **Edit configuration** screen appears.

3. Select the GPS button. The GPS slider bar appears:



TIP Use a high setting on the GPS slider bar whenever a project requires the highest level of precision.

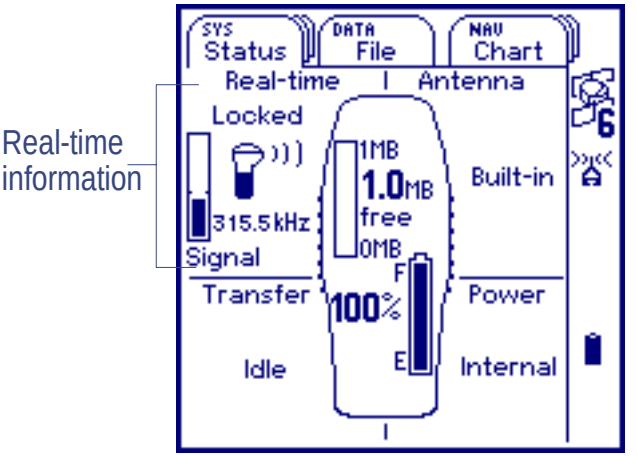
4. Press ◁ to lower the GPS slider bar four notches. This lets you collect more positions, but some may be less precise. Because you are collecting data in a forest area where trees can block your view of the sky, this may provide better overall results. If the slider bar is set too high, the precision of the positions collected is high, but not enough positions will be collected to map the entire park. For more information see **GPS**.

NOTE To adjust the GPS slider bar using the Pathfinder Office Configuration Manager, refer to the Pathfinder Office online Help.

Checking the real-time status

When using the **Beacon-on-a-Belt™ (BoB) receiver** to provide real-time corrections, always check the real-time status before recording data or navigating. Use the Status tab to view the real-time status.

Press SYS until **The Status tab** is active.



Real-time information

Use this screen to check that the GeoExplorer 3 is receiving corrections from the Beacon-on-a-Belt (BoB) receiver. When the GeoExplorer 3 is receiving differential corrections, the real-time icon appears. This icon indicates the type of RTCM source. For this tutorial the Beacon-on-a-Belt (BoB) icon appears.

NOTE You can also use the **Status bar** on the right to check that the GeoExplorer 3 data collection system is receiving real-time corrections. When the GeoExplorer 3 is receiving corrections, the real-time icon appears. This icon flashes if there is a problem with the real-time source connection.

Navigating to and updating features

When updating GIS data, use the NAV section to navigate to features recorded previously. The GeoExplorer 3 data collection system provides three methods to navigate—a road, a compass, and a chart view. Select the method that suits your application or personal preference.

You did not record the original water faucet features, so you do not know where they are. Use the GeoExplorer 3 data collection system and a real-time source to navigate to them.

There are different ways to select a feature and navigate to it. In this section the following tasks are explained:

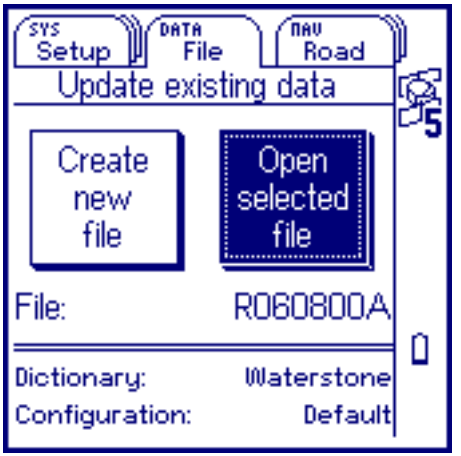
- **Opening a data file**
- **Selecting a target**
- **Navigating to a target using the Chart tab**
- **Updating a feature**
- **Selecting a target using the cursor**
- **Navigating to a target using the Road tab**

Opening a data file

Before starting the data update session, open the file that contains the GIS data. Use the File tab to do this.

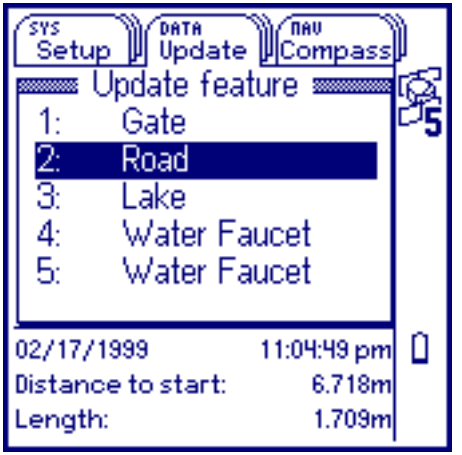
To open an existing file:

1. Press DATA. The File tab appears.
2. Press ▷ to highlight Open selected file.



The data file that you transferred from the GIS is automatically selected in the File field as this was the last data file transferred to the GeoExplorer 3.

3. Press ENTER to open the selected file. The Update feature list appears:



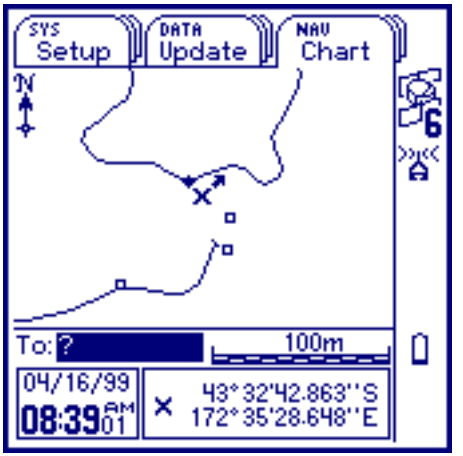
You have opened a data file, so you can now use the NAV section to navigate to the first water faucet.

Selecting a target

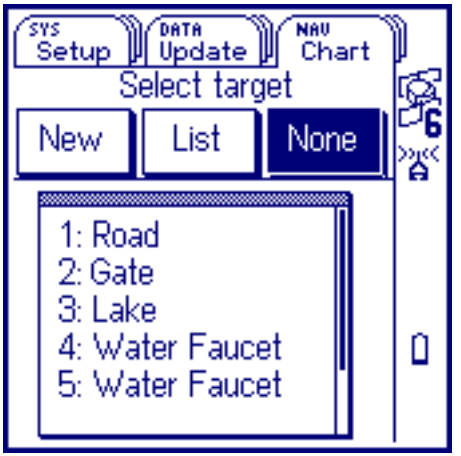
To navigate to a feature, select it as your target. Do this using the list of waypoints and features.

To select a target using the List option:

1. Press NAV until the Chart tab is active.

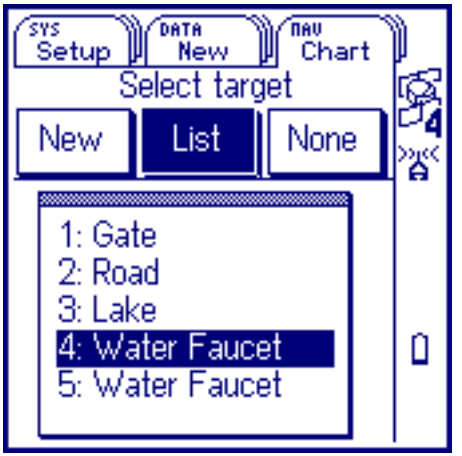


2. Press ENTER. The **Select target** screen appears:



3. Press ◁ to highlight List.

4. Press ▽ to highlight the first water faucet feature that you want to navigate to.



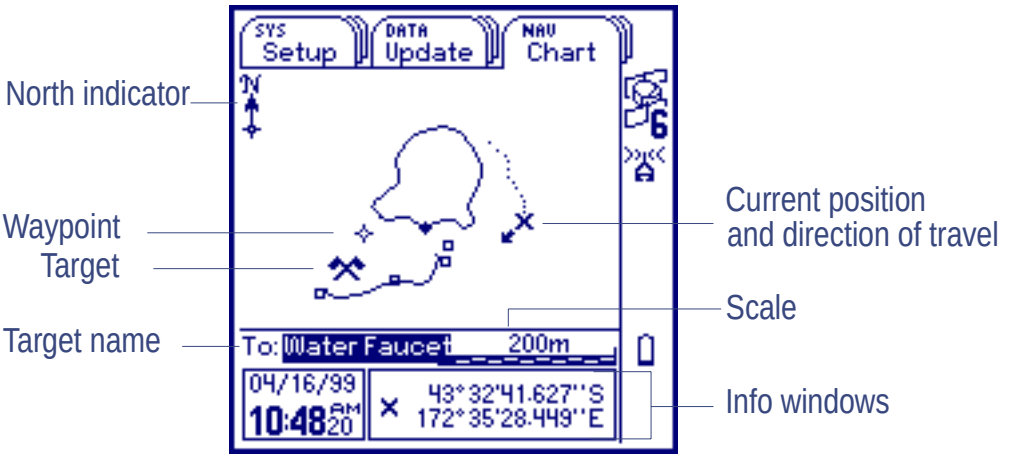
5. Press ENTER. The chart appears and shows your position relative to the location of the target. A crossed-flag symbol indicates the water faucet feature selected as the target.

TIP When you are navigating, you can use any of the NAV tabs (Road, Compass, or Chart) to select a target. From any of the NAV tabs press ENTER and use the **Select target** screen.

Navigating to a target using the Chart tab

The chart is useful for navigating on foot.

Use the information displayed on the chart to navigate to the selected target.



The chart displays all the information that you need to navigate to the target. The **Info windows** at the bottom of the screen display different types of navigational information. By default, the information that is displayed in the Info windows on the Chart tab is the Current time and Coordinates. Configure this information to suit your application or personal preference.

To navigate to the selected target, move towards the target symbol. Your current position is displayed by a cross and a small, solid arrow symbol. This arrow points in the direction that you are heading. The GPS trail indicates where you have been. As you move closer to the target, the current position symbol on the chart gets closer to the target symbol. You have reached the target when the position symbol is over the top of the target symbol.

The following examples show how to navigate using the chart screen.

You are heading towards the bottom of the screen. Turn left to reach the target.

You are heading towards the left of the screen away from the target. Turn (180°) to reach the target.

You are heading towards the top of the screen. Turn right to reach the target.

You are heading directly towards the target.

NOTE When the target is not visible on the screen, the bearing to the target is displayed as an arrow from your current position to the target. To navigate to the target, line up your current heading with the bearing to the target. For more information see **Using the Chart tab**.

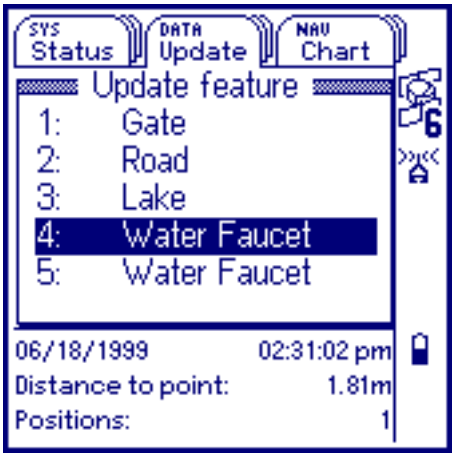
TIP Use the **Chart option list** to zoom in or out and to change the layers displayed on the chart.

Updating a feature

You have opened the existing file and navigated to the water faucet feature, now use the Update feature list to edit the attributes.

To update a feature:

1. Press DATA. The Update feature list appears:

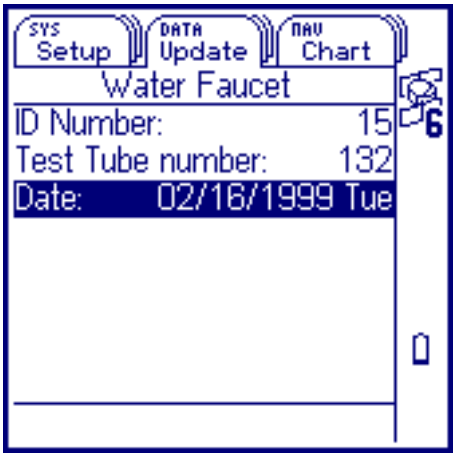


The number that appears in front of the feature name corresponds to the number in front of the feature you selected as the target. Select the same water faucet in the Update feature list as you did in the Select target screen.

If you have this feature selected as a target, it is automatically highlighted when you display the Update feature list.

If necessary, refer to **Selecting a target**.

2. Press ENTER to display the attribute entry form for this feature. Use it to update the attributes for the water faucet.



3. The first attribute is the ID Number. Use this attribute to verify that you are updating the correct water faucet. The number on the faucet matches the ID number of the feature you have opened on the GeoExplorer 3 handheld, so select the Test Tube Number attribute. A **Numeric entry** field appears.
4. Use the **Numeric entry** field to enter the test tube number. The number on the test tube is 234.
5. The Date is automatically updated by the GeoExplorer 3 data collection system. Press CLOSE to save the attribute changes and return to the Update feature list.

For more information see **Updating attribute values**.

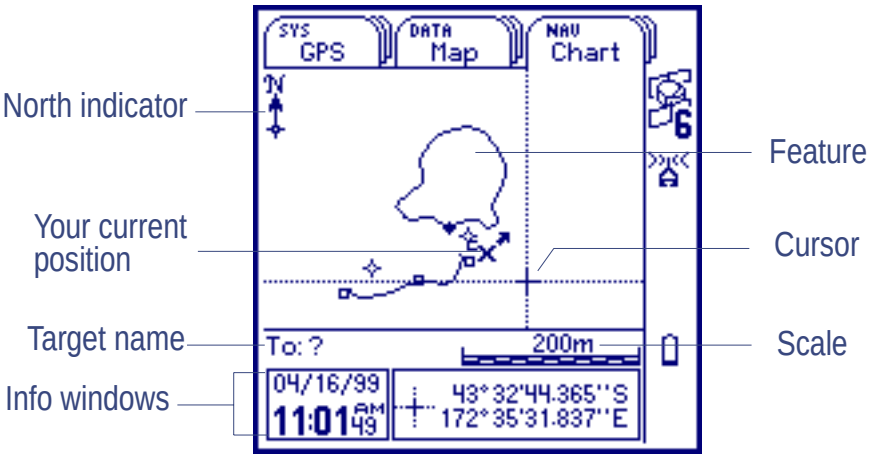
NOTE A check box appears next to the features in the Update feature list. When a feature is updated, a ✓ appears in the check box. Until then the check box is empty.

Selecting a target using the cursor

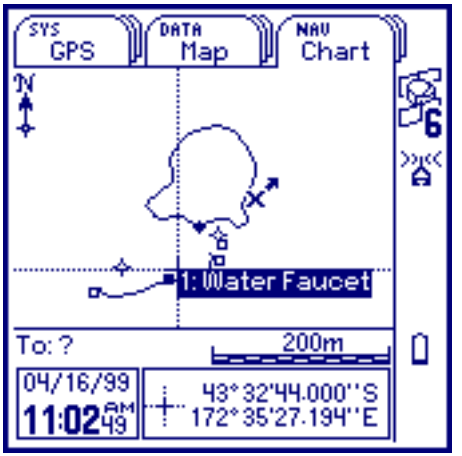
You can use the cursor to select a target to navigate to.

To select a target using the cursor:

1. Press NAV until the Chart tab is active.
2. Press one of the arrow keys to activate the cursor. The cursor appears:



3. Use the arrow keys to move the cursor to the water faucet feature that you want to navigate to. When the cursor is on the feature, the feature is selected. The name appears, and the feature symbol is highlighted.



4. Press ENTER.

   The **Select target** screen appears. The feature you selected on the chart automatically appears highlighted in the target list.

5. Press ENTER to accept the highlighted feature as the target.

   The selected water faucet feature appears as the crossed-flag symbol, and the feature name is displayed in the To field.

For more information see **Using the cursor**.

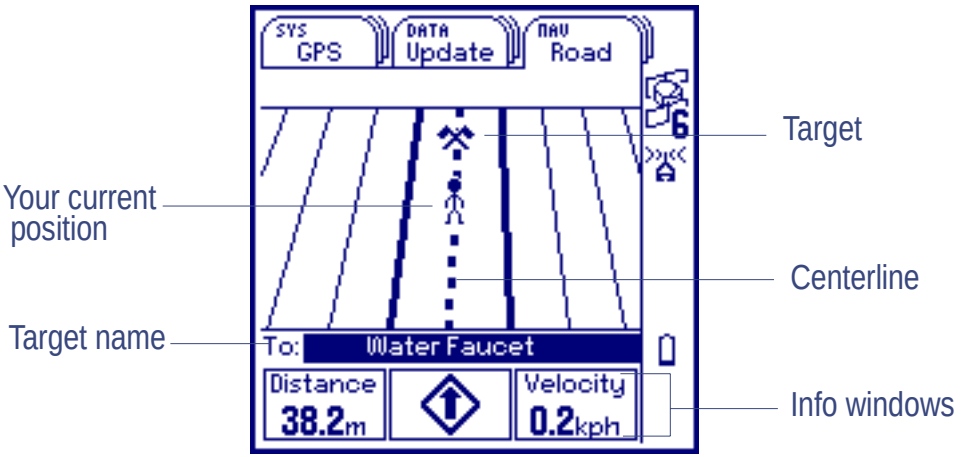
Navigating to a target using the Road tab

Use **The Road tab** when navigating to a feature or waypoint from a vehicle. You can also use it to navigate while walking, but the Compass or Chart tab may be easier to use.

WARNING The Road tab displays a straight line bearing to the target. Do not attempt to drive to a target using this tab as a source of direction.

To navigate to a feature using the Road tab:

1. Press NAV until the **The Road tab** is active. The road on the screen moves as you navigate to the selected water faucet feature.
2. Use the information displayed in the Info windows and the animation of the road to navigate to the target.



The road screen displays your current position as a person symbol. The direction you are moving is always towards the top of the screen. You need to move toward the target symbol until the distance is zero. As you move close to the target the width of the road increases.

When you are on course, the road is displayed vertically on the screen. When you are off course, the road is displayed skewed (at an angle) on the screen. The angle (clockwise or counterclockwise) at which the road is turned depends on how far off course you are.

More...

As you follow the directions in the Info windows and move closer to the target, the Distance decreases and the road width increases. For more information see **Using the Road tab**.

3. When you reach each water faucet, update its attributes as you did for the first water faucet that you revisited. For more information see **Updating a feature**.

TIP By default, the Info windows on the Road tab show Distance, Road sign, and Velocity. You can configure the **Info windows** to suit your application or personal preference.

Creating a waypoint

While in the field collecting water samples, you come across a fallen tree. Mark it as a waypoint, so that the field crew can navigate back to it and clear the path.

A waypoint is a single position created using the GeoExplorer 3 (in the field) or using the Pathfinder Office software. Use it to record a geographic point of interest that is not part of your data file.

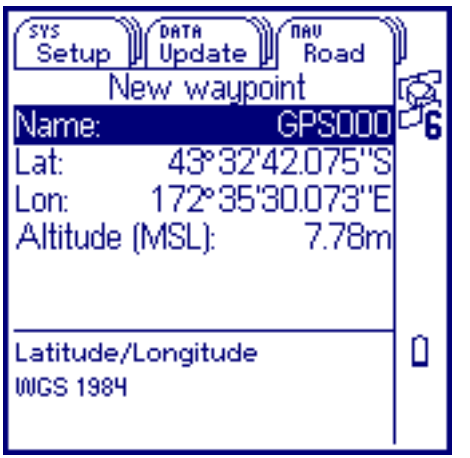
A waypoint is different from a **feature**. No attribute information is recorded for a **waypoint** and the GPS position is not linked to a data file. Waypoints are primarily used for navigation, and can be transferred to Pathfinder Office as a separate waypoint file.

A waypoint has a number, name, latitude, longitude, and altitude. You can use the Option list to create and edit waypoints.

To create a waypoint at your current location:

1. Press OPTION. The option list appears:

2. Select New waypoint.
3. The GeoExplorer 3 automatically names the new waypoint. The Name field is already highlighted, so press ENTER to change the name. Use the **Text entry** field to clear the assigned name and enter **TREE** as the new name for the waypoint.
4. The GeoExplorer 3 automatically assigns your current GPS position as the position of the waypoint. Press CLOSE.



TIP Waypoints can be created in the office using Pathfinder Office. For more information refer to the Pathfinder Office online Help.

Closing the file

When you have competed your data update session, turn off the GeoExplorer 3 handheld. To do this, press  . This closes the data file and turns off the GeoExplorer 3.

ADVANCED FUNCTIONS

When using the GeoExplorer 3 data collection system to collect and update data, you can use a variety of advanced functions to provide more accurate and efficient results. The following topics are discussed here:

- **Advanced data collection**
- **Carrier phase data collection**
- **Coordinate systems**

Advanced data collection

Advanced data collection techniques offer time-saving techniques for efficient data collection. Step-by-step instructions are provided for:

- **Advanced datalogging options**
- **Recording positions only**
- **Continuing line and area features**
- **Segmenting line features**
- **Offsets**
- **Repeating features**

Advanced datalogging options

The GeoExplorer 3 data collection system provides three closely-related options for logging GPS data. These options differ in their timing of GPS data collection relative to the start of a feature.

- **Before** – start collecting GPS positions before starting a feature.
- **Now** – simultaneously collect GPS positions and start a feature.
- **Later** – start a feature, then start collecting GPS positions later.

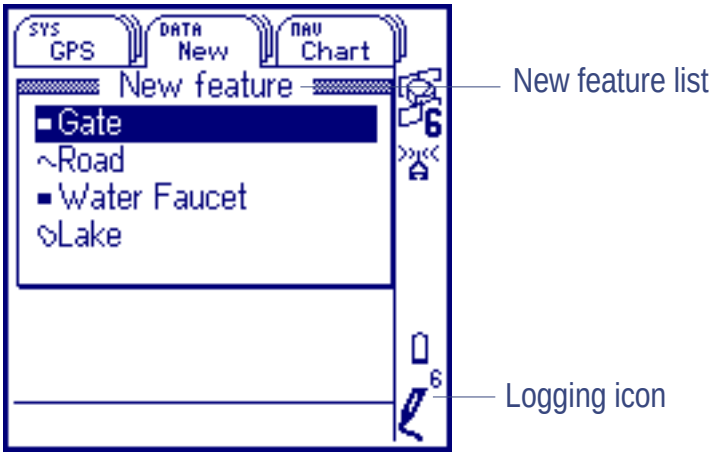
Before

This option is useful when using a data dictionary that contains a large number of feature types. For example, if a data dictionary has 50 features and you must scroll through the list to find the feature to record, you can start logging and then select the feature. The GPS positions collected and stored are automatically assigned to the next feature that you select. This means that you can collect extra GPS data while searching for the appropriate feature type.

You can also use the Before option to quickly and efficiently collect the start and end of line features. For example, if you are driving and come to the start of a bridge, press LOG to start logging GPS positions. When you reach the end of the bridge, press LOG to pause logging. Then scroll through the feature list, select the bridge feature type, and enter the attributes. Press CLOSE to close the feature and assign all GPS data that you recorded before starting the feature.

To use the Before option:

1. Press DATA until **The New tab** is active. Press LOG. The GeoExplorer 3 data collection system starts to log GPS positions and the logging icon appears in the **Status bar**.



NOTE When using the Before option, the logging interval used is the minimum configured logging interval (for all features). To change the minimum logging interval select **Edit feature settings**.

2. To assign the GPS positions to a feature collected using the Before option, select the feature from the New feature list. The attribute entry form appears.
3. Press CLOSE to stop logging and store the feature. (Press LOG to stop logging if no feature is selected.)

Recording positions only

Most of the GPS data you collect with the GeoExplorer 3 data collection system is recorded in files rather than as waypoints. A file lets you store positions continuously. If you do not want to use a data dictionary, you can collect positions in a file without collecting feature and attribute data. Positions are recorded at the minimum logging interval for all features. To change this interval select **Edit feature settings**.

Recording just GPS positions is a useful technique in cases where you do not need to record feature and attribute data. A utility company, for example, may want to record a breadcrumb trail of the day's activities. In this case, you would not want to collect feature or attribute information, only the positions.

To record GPS positions only:

1. Create a new file using **The File tab**.

NOTE The Dictionary field must have a value. Use the generic dictionary. The data dictionary selected does not matter, as it will not be used.

2. Press LOG to start logging GPS positions.
3. Press LOG to pause logging GPS positions.
4. Press CLOSE to stop logging.

Continuing line and area features

When recording a line or area feature, you could come across a point feature that you need to record. The point feature may be along the line/area feature, or it may be some distance away. When collecting a path (line feature), for example, you might encounter a gate (point feature). You do not have to record the entire path and then return to record the gate. Simply end the path feature, collect the gate feature, and then use the Continue option to continue the path feature you were collecting.

NOTE Other Trimble GIS products refer to this functionality as Nesting.

NOTE You can collect as many point features within a line or area as you want. The number is limited only by storage space in the GeoExplorer 3 handheld.

To use Continue:

1. Press CLOSE to close the line or area feature you are collecting. The New feature list appears.
2. Select the point feature that you want to collect. The attribute entry form appears and logging starts.
3. When you have recorded attributes for the point feature and logged sufficient GPS positions, press CLOSE to store the feature. The New feature list appears again.

4. Press OPTION. From the option list, select Continue <line/area feature name>. The GeoExplorer 3 returns to the attribute entry form for the line or area feature that you were logging before and continues to log GPS positions for that feature.
5. When you complete the traverse of the line or area perimeter, press CLOSE to store the feature.

Segmenting line features

When collecting line features, it is often convenient to divide a line into a number of segments. Segmenting line features allows you to specify different attribute values for parts of the same physical line. You can also end one line feature and immediately start another of the same type, while still moving. This is useful when mapping roads or highways where it is difficult (or illegal) to stop at the point where one feature ends and the next starts.

To segment a line feature:

1. Start collecting the line feature.
2. From the attribute entry form, press OPTION and select Segment.

   The current line feature is stored and another line feature of the same type is immediately started with the same attribute values as the previous one. The last GPS position of the first feature is identical to the first GPS position of the second feature, so that adjacent segments join end-to-end in the GIS.

NOTE When you select Segment, the GeoExplorer 3 validates the attributes of the first line feature. Always complete attribute entry before selecting Segment to store one feature and start another.

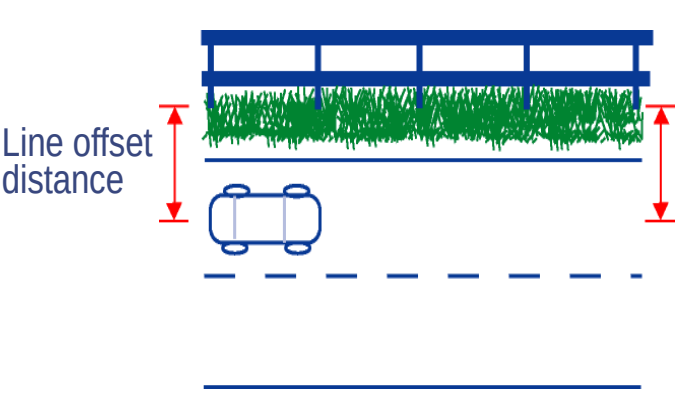
CAUTION If you select Segment and no current GPS position is available (due, for example, to poor satellite geometry), the GeoExplorer 3 does not start with the last GPS position of the previous line feature. Instead, the new line feature starts from the first GPS position that becomes available. In this case, a gap occurs between the segments.

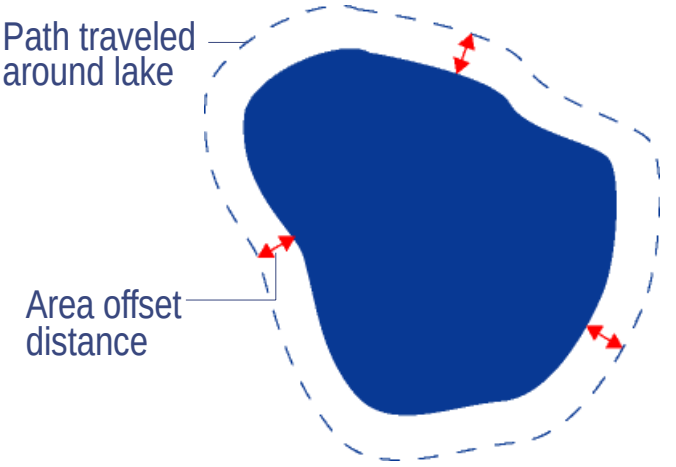
Offsets

If you cannot travel over the top of, or right next to, a feature, you can enter an offset and record it at the specified distance. When collecting a tree feature, for example, it is typically easier to stand some distance (such as 10 paces to the North) from the tree and record its attributes. This ensures good GPS reception, and lets you see the tree clearly to assess its condition. Specify an offset to the tree of “10 m South”. This ensures that the tree is positioned correctly in the GIS. This is an example of an offset point feature.

The attribute entry form for each feature type has an Offset option. Select Offset to view or enter the offset for the feature being collected. If you configure a non-zero constant offset for the class of feature being collected, the default offset value for that feature is as configured. For information about configuring constant offsets see **Feature settings**.

You can also use offsets for line and area features. When collecting a line feature such as a fence, it may be easier to drive along the road beside the fence and record the positions of the fence an offset feature. Another example is when collecting an area feature such as a lake, you could walk some distance from the lake edge and record its perimeter using an offset. This diagram shows these examples.





NOTE Any feature (point, line, or area) can have only ***one*** offset associated with it. This means that to record a line feature with a given offset and then change the offset during the line feature, you must segment the line at that point. Each segmented line feature has its own offset. To collect an area feature using offsets, the same offset value must apply to the whole area feature. This may require a test run around an object to make sure that you can remain a consistent distance from it.

To offset a feature:

1. Start the feature.
2. From the attribute entry form, press OPTION and select Offset. An Offset form appears:

The fields that appear in the Offset form depend on the type of feature you are collecting (point, line, or area). This example shows the fields for a line or area feature. For a point feature the fields are: Bearing, Horz. distance, and Vert. distance.

3. Enter a value for each field. Select the field and use the data entry field to enter the value.

More...

4. When the Offset form is complete press CLOSE. The attribute entry form reappears.
5. When you have recorded attributes for the feature and logged sufficient GPS positions, press CLOSE to store the feature. The New feature list appears.

NOTE To remove an offset press OPTION and select Reset.

Repeating features

Use Repeat to efficiently record a sequence of similar features. You do not have to re-enter values for all attributes. Just flip through, checking that each attribute value is correct for the selected feature. Change only those that need to be changed.

When you use Repeat, default attribute values are copied from the last recorded feature of that type.

To Repeat attributes for similar features:

1. When the New feature list is active, press OPTION and select Repeat. Press CLOSE to close the option list. When Repeat is selected a ✓ appears in the check box.
2. Select a feature from the New feature list. The attribute form appears. The attribute values that appear are those of the last recorded feature of that type. Edit them if necessary. Press CLOSE to save the attribute values and store the feature.
3. Select another feature. Continue until you want to turn off the Repeat mode.

To turn off the Repeat mode:

- Press OPTION and select Repeat. The ✓ disappears.

NOTE When Repeat is not selected, default attribute values are determined by the data dictionary. The data dictionary specifies a default value for each attribute belonging to a feature where appropriate.

Carrier phase data collection

To collect a feature with a precision better than regular GPS data, configure the GeoExplorer 3 data collection system to log carrier phase data.

The following topics introduce you to the basic concepts and then describe in detail how to collect and use carrier phase data.

- **Before you begin**
- **Configuring the GeoExplorer 3 data collection system**
- **In the field**
- **Back in the office**

Before you begin

The following topics discuss some of the concepts associated with using carrier phase data.

Why use carrier phase data?

In a conventional GPS session, the GeoExplorer 3 logs independent GPS positions. If enough satellites are visible and the geometry is good, it continues to log reliable positions.

When the GeoExplorer 3 also logs carrier phase data, positions collected in the field can be postprocessed to generate more precise positions once you are back at the office. Because measurements are collected from each individual satellite, the positions generated during postprocessing are more precise than positions logged in the field.

Planning

You require a clear view of the sky at all times when collecting carrier phase data, so avoid obstacles such as trees, bridges, and tall buildings. Choose a time of day when you can expect to track a maximum number of satellites with the best possible geometry.

NOTE Always make sure that you collect sufficient useful data while in the field.

Collecting sufficient data

Always make sure that at least four satellites remain visible for enough time to provide sufficient useful data for postprocessing.

Number of satellites

To provide sufficient carrier phase data to achieve the required precision, the GeoExplorer 3 data collection system needs to log data from at least ***four*** satellites for the required minimum time. However, you will need to log data from at least five satellites before the postprocessing software can compute the precision of the generated positions. The five satellites together provide the necessary redundancy for the precisions required, but you can use more.

"Loss of lock" occurs when the number of available satellites drops below four.

NOTE If you minimize the number of times that loss of lock occurs during a session, you greatly increase the precision of the postprocessed results.

When you start a file that has any features configured to carrier, the GeoExplorer 3 data collection system starts to record carrier phase data. As soon as four or more satellites are available, a counter starts. When the minimum time has elapsed, all of the carrier phase data recorded during ***that*** period can be used during postprocessing.

Time

The minimum time for which four or more satellites must be available is 10 minutes. The Differential correction software will not process data blocks less than 10 minutes in length.

Counter

A counter in the GeoExplorer 3 handheld starts to measure time as soon as four or more satellites are available.

When the counter reaches the minimum time, a message is displayed in the message box. It indicates that the current “block” contains ***sufficient*** useful data.

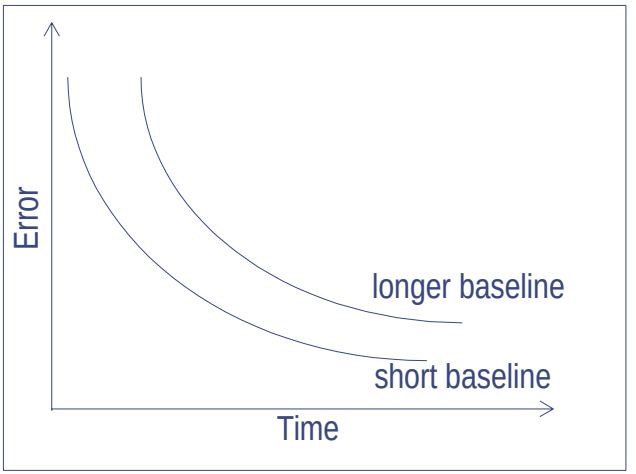
If you lose lock before the end of the minimum time, the data collected until then may not provide the required precision during postprocessing. Consequently, the counter is automatically reset to zero when loss of lock occurs. It only restarts when lock is regained.

NOTE The counter is active ***only*** if the GeoExplorer 3 is logging carrier phase data from four or more satellites—it does not simply record the time that has elapsed since the beginning of the file.

Time and precision

The precision of positions generated during postprocessing depends on a combination of the number of satellites used, the distance between base and rover, and the period of time for which data is recorded from those satellites. Collecting data for longer generally gives more precise positions.

Assuming that enough satellites are available, the following figure shows the relationship between the time taken to collect carrier phase measurements and the precision of the positions generated during postprocessing.



What is a “block” of data?

When you start a file that has any features configured to carrier, the GeoExplorer 3 handheld starts to record carrier phase measurements. Useful data is not stored as one continuous stream, however, but as a series of “blocks”.

The beginning and end of each block is determined by the number of available satellites. As soon as four (or more) satellites are available, a new block begins. This block continues until lock is lost. When lock is regained, a new block begins.

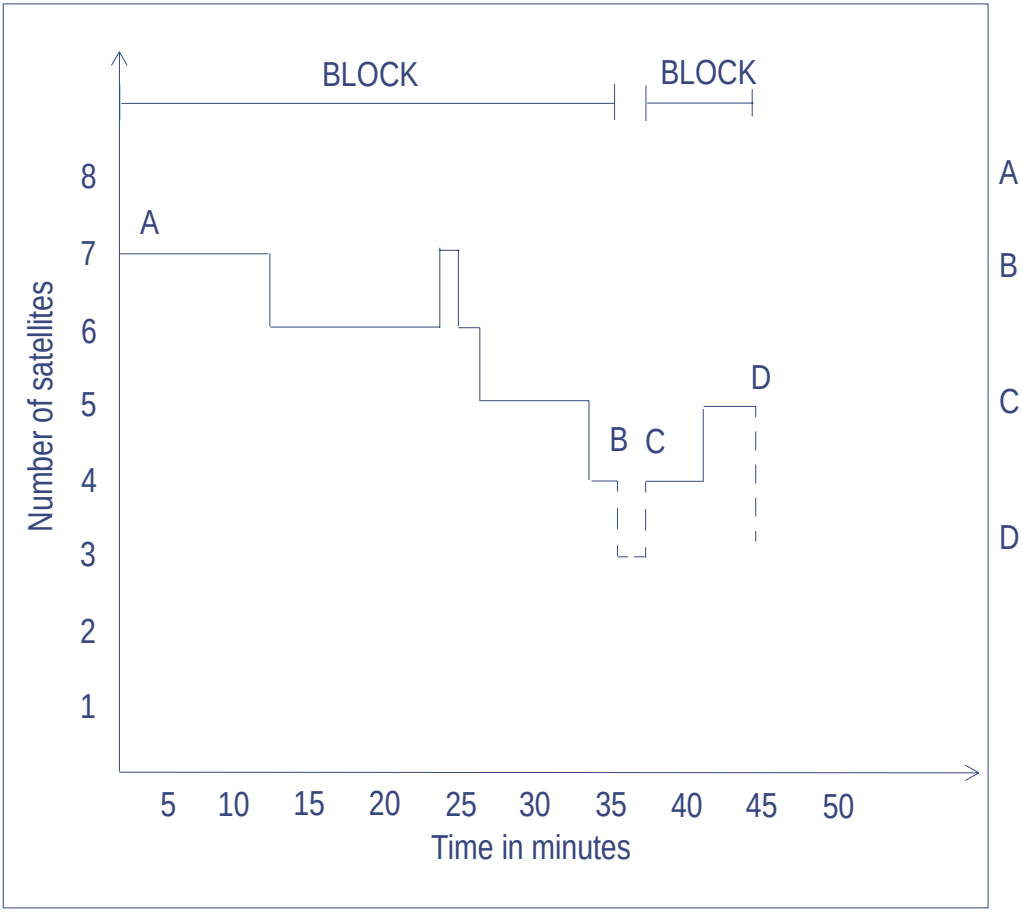
The GeoExplorer 3 continues to create blocks of data throughout the file. These blocks together constitute the measurement data for the entire session.

Opening and reopening files

The files that you create in the GeoExplorer 3 are independent of each other, so carrier phase data collected in one file is of no use to another.

If you use the GeoExplorer 3 to collect carrier phase data, you need to collect sufficient data **every** time you open a file—this is true whether you open a new file or reopen an existing one. Always make sure that you collect sufficient data for each file.

The figure below shows how the GeoExplorer 3 creates distinct blocks of carrier phase data as the number of satellites changes.



A = 4 or more satellites – useful carrier phase data

B = lock is lost – unusable carrier phase data

C = lock is regained (4 or more satellites) – useful carrier phase data

D = lock is again lost – unusable carrier phase data

More...

In the previous figure, the counter begins at time zero and stops at 35 minutes when lock is lost (B). This creates the first block of carrier phase data. The minimum time required for the differential correction utility to process carrier phase data successfully is 10 minutes, so the first block contains sufficient useful data. The longer the blocks are in time, the greater the precision achieved.

Between B and C, the required minimum number of satellites is not met. The counter does not start, and the carrier phase data collected during this period is not used.

When four satellites are again available (C), the GeoExplorer 3 creates a new block and the counter begins to measure again from time zero. In this example, this happens 38 minutes after the start of the session. Lock is lost again at 45 minutes (D), after 7 minutes worth of data has been collected. Since the required minimum time is 10 minutes, this block does not contain sufficient continuous data.

Recording features

While the GeoExplorer 3 data collection system collects carrier phase measurements in the background, you start to record features—these can be points, lines, or areas.

Decide carefully when to start and stop recording feature data. Look for obstructions that may slow down the ability of the GPS receiver to maintain lock or sufficient satellites (that is, trees).

Before starting the first feature in a file, wait until four or more satellites are available. Once carrier phase data from at least four satellites is received, the GeoExplorer 3 counter starts.

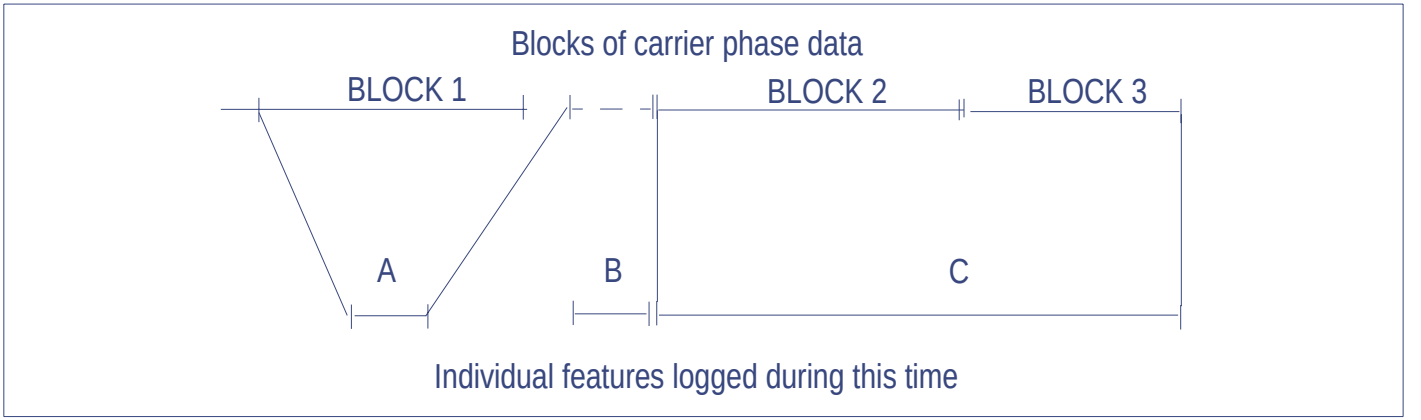
Ending a feature before minimum time is reached

Once the counter is running, you can choose to end the feature and stay where you are until the minimum time is up. When the minimum carrier time is achieved, you can move to the next feature. Using this method, you can make sure that you have sufficient data to generate precise positions.

Alternatively, if you think you are unlikely to lose lock, you can move to the next feature ***before*** sufficient carrier phase data is collected.

As long as a block eventually contains sufficient useful data, you can generate precise positions for any feature that falls within it.

This figure shows how individual features benefit from blocks of carrier phase data stored at the time they were recorded.



In this example, Block 1 contains sufficient carrier phase data. Feature A was started after the counter started for Block 1 and ended before the success beep, but during postprocessing it derives the full benefit of all data recorded for Block 1.

Feature B was unwisely recorded during a period when no useful data was recorded. You probably need to record this feature again.

Feature C was started when the counter started for Block 2. Logging to this feature continued after the minimum carrier time was achieved. Then there was a loss of lock and a new block of carrier phase data started. The feature was ended before the minimum carrier time was achieved for this block of data, and the file was closed. In this case, the portion of the feature collected before the loss of lock occurred (indicated by the end of Block 2) should achieve the desired precision. However, the second portion of the data, associated with Block 3 may not achieve the desired precision.

CAUTION Move to the next feature before the minimum time is up only if loss of lock is unlikely.

As you record features, be aware of the following:

- the number of satellites available
- the position of these satellites—if they are to stay visible, they should be high rather than low on the horizon
- any obstruction likely to cut off your view of the satellites as you move

Read any messages that appear in the message box. They indicate how useful the current data is. The message box also shows if loss of lock has occurred, so you can measure that feature again if necessary. If it is clear that a block contains insufficient data, recapture any features that are affected before leaving the site.

Postprocessing

Postprocess all data using an office computer running the Differential Correction utility of the GPS Pathfinder® Office software.

In addition to carrier phase data, the GeoExplorer 3 data collection system also logs code phase data in the field.

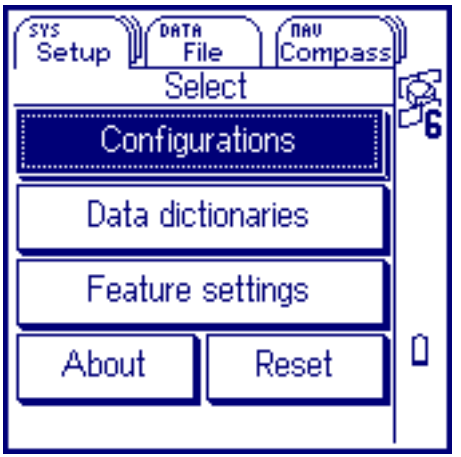
During postprocessing, the Differential Correction software uses the carrier phase data to generate positions of high precision. It computes positions, and stores these results over the top of the code phase data. The code phase data simply assists with the arrangement of the new positions.

Finally, the software computes the estimated precision of the generated positions. This helps you to evaluate the GPS results.

Configuring the GeoExplorer 3 data collection system

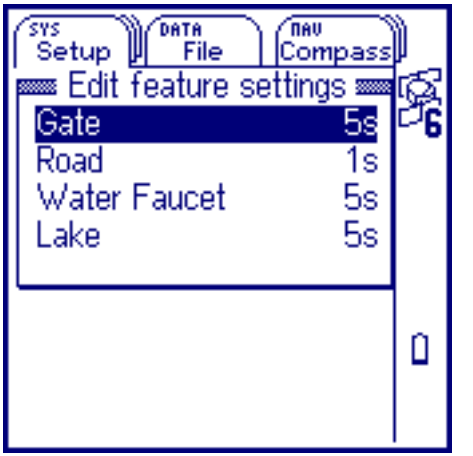
If you decide to use carrier phase data, configure the GeoExplorer 3 data collection system as follows:

1. Decide which features you want to collect using carrier phase data collection.
2. Press SYS until the Setup tab is active.



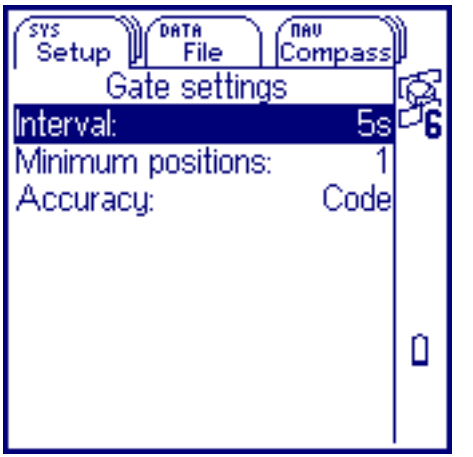
3. Select Feature settings. The Select feature settings list appears.

4. Select the name of the data dictionary to be using during the carrier phase data collection session. The Edit feature settings screen appears:



NOTE This list shows all features contained in the selected data dictionary. The specified logging interval for each feature is also shown.

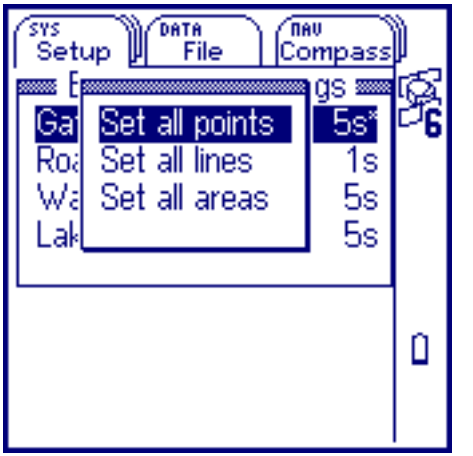
5. To configure an individual feature, select it from the list. The corresponding <feature> settings form appears:



NOTE Use this form to edit the logging interval and minimum number of positions required, and to change the accuracy.

By default, the accuracy is set to Code. Change this to Carrier. Press CLOSE to close the form and save all changes.

6. Press OPTION to configure all points, all lines, or all area features. The **Edit feature settings option list** appears:



NOTE Use these options to make the same change to all features of a particular type.

Select one of the options. The corresponding Set all <feature type> form appears. By default, the accuracy is set to Code. Change this to Carrier. Press CLOSE to close the form and save all changes.

You are now ready to go into the field and collect carrier phase data.

TIP To close a form without saving the changes, press Fn CLOSE.

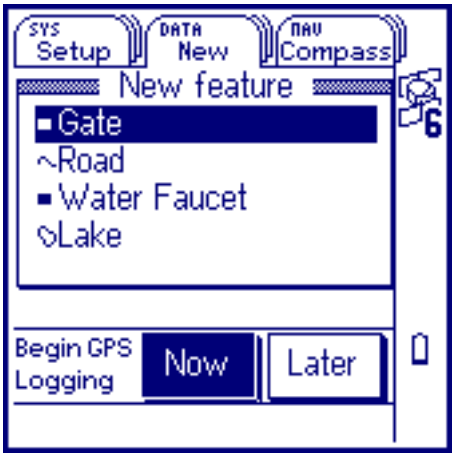
In the field

The techniques used when collecting **carrier phase** data are slightly different from those used when collecting **code phase (C/A code)** GPS positions. A carrier phase data collection session includes the following tasks:

- Opening a new file using **The File tab**
- **Collecting carrier phase data**

Collecting carrier phase data

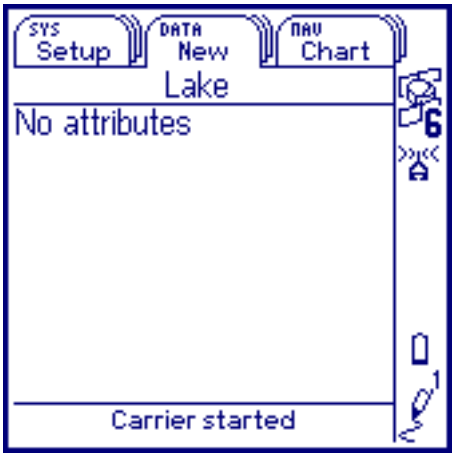
When a data file is open, the New feature list appears:



Features in this list are determined by the data dictionary specified when the file was created.

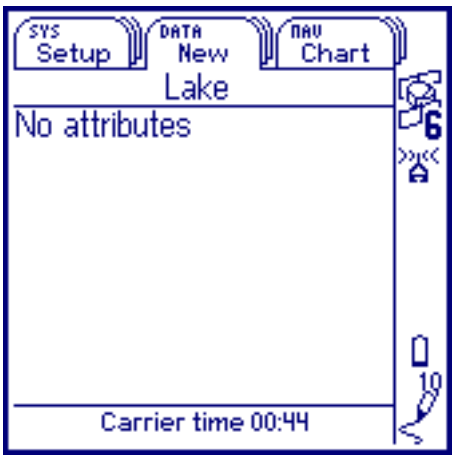
To collect carrier phase data:

1. Start a feature by selecting it from the New feature list. If the feature is configured for carrier, the GeoExplorer 3 begins logging carrier phase data. The **Carrier started** message appears briefly in the message box.

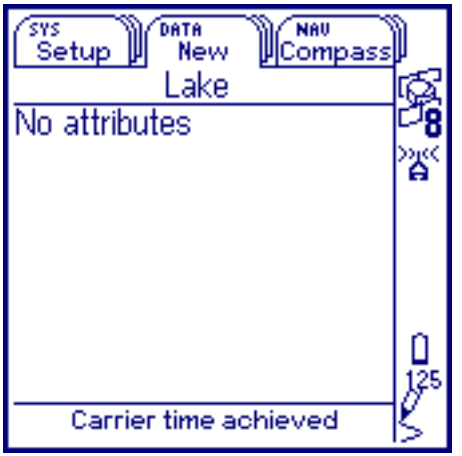


NOTE The logging icon will change to the carrier phase logging icon when carrier phase logging starts.

2. Check the carrier time. As you log carrier phase data, the GeoExplorer 3 displays the time elapsed since the current block of data started. This is referred to as “carrier time”. The carrier time appears in the message box at the configured feature logging interval and shows, in minutes and seconds, the amount of data collected.



3. Stay at the feature until you have logged carrier phase data continuously for at least 10 minutes or until the desired time has elapsed. The **Carrier time achieved** message appears in the message box.



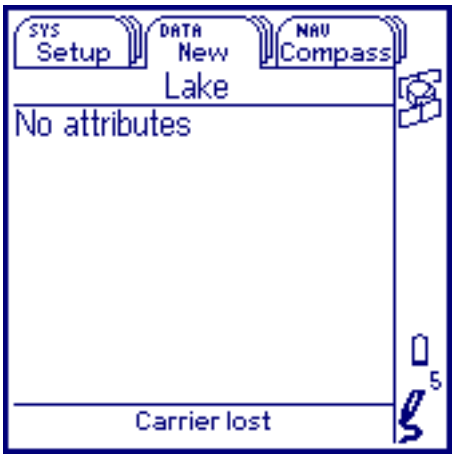
This means you have logged sufficient carrier phase data to achieve the precision required for the features collected since the counter was last reset. This data will be used until the counter is reset again.

4. Press CLOSE to close the feature and save the carrier phase data.

NOTE Trimble recommends that you occupy the first feature for the full time before moving on to other features. For more information see **Ending a feature before minimum time is reached**.

5. Repeat Steps 1 through 4 for the next feature.
6. When you are finished collecting features press CLOSE to close the file.

If you try to close the feature before the minimum time is up, the GeoExplorer 3 asks for confirmation that you want to store the feature.



While you are logging carrier phase data, the GeoExplorer 3 warns you whenever the GPS receiver loses lock. A message appears in the status line.

The **`Carrier lost`** message tells you how long (in minutes and seconds) the last continuous block was at the time that lock was lost.

When the counter is reset, the **`Carrier time`** message shows 00:00.

In addition, the GeoExplorer 3 writes a note to the data file every time the counter is reset. This records when the carrier time was reset, and the amount of carrier phase data collected for the previous block. Review this note back at the office using the Pathfinder Office timeline.

If the minimum time is not reached, you can choose whether to reoccupy the affected features or move on. If you move on, the affected feature is unlikely to achieve the desired precision.

Back in the office

To transfer data from the handheld to the office computer, place the GeoExplorer 3 handheld in the **GeoExplorer 3 Support Module** and use the Data Transfer utility that is part of the Pathfinder Office software.

Process the files using the Pathfinder Office Differential Correction Utility. For instructions on processing data files, refer to the Pathfinder Office online Help.

Coordinate systems

When using the GeoExplorer 3 data collection system to collect GPS data, you can configure the coordinate system, zone, and datum. This lets you enter and display coordinates using the coordinate system that best suits you and the location you are working in. The following topics are discussed:

- **Coordinate systems and datums**
- **Coordinate systems available on the GeoExplorer 3 data collection system**
- **Using Coordinate System Manager**
- **Transferring coordinate systems**
- **Configuring coordinate systems**
- **Resetting coordinate systems**

NOTE Uploading of Coordinate systems is not available with the **GeoExplorer 3c edition**.

Coordinate systems and datums

Coordinate systems are three-dimensional reference frames used to describe the location of objects in space. The GeoExplorer 3 data collection system provides you with your position anywhere on the earth's surface in relation to the coordinate system you have configured.

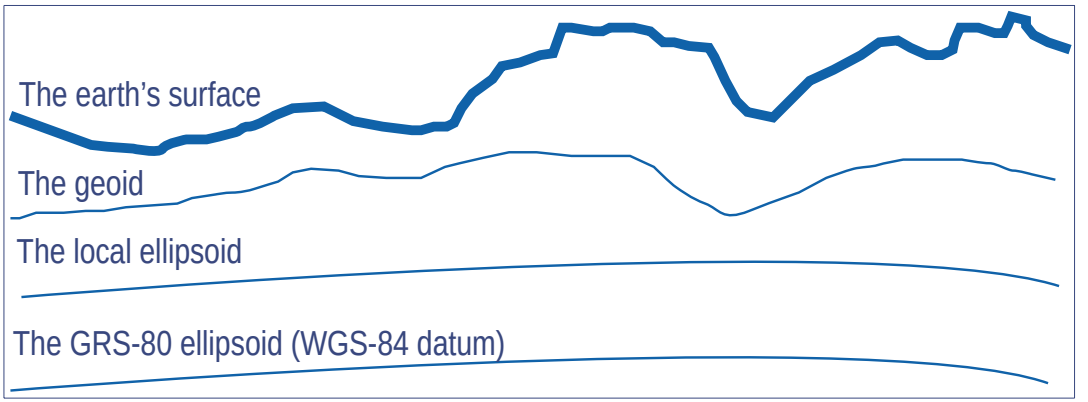
Before you can compare geographic data obtained from different sources, the data must be referenced to the same **datum** and coordinate system. This is because different datums and coordinate systems provide different coordinate values for a single geographic location.

GPS positions are normally expressed as latitudes and longitudes relative to a mathematical model called a datum. The datum used by GPS is called the World Geodetic System 1984 datum (or WGS-84). A datum is defined by the relationship between an **ellipsoid** and an origin point. An ellipsoid is a three-dimensional surface shaped like a squashed sphere, which approximately models the shape of the earth (either as a whole, or over a particular part of the earth). The WGS-84 datum is defined in terms of the GRS80 ellipsoid.

For most land-based GPS applications, and particularly for GIS data capture applications, latitudes and longitudes are much less convenient. Typically, a GIS will represent the coordinates of geographic features in a locality of interest using a rectangular grid (running North and East) and will presume that the earth is locally flat. A local ellipsoid can be defined to provide a good approximation to the shape of the earth in that locality. A datum transformation and a map projection are then used to transform coordinates from this local ellipsoid to the GIS's flat-earth model.

More...

Heights can be displayed by the GeoExplorer 3 relative to either a local ellipsoid, or an empirically defined surface known as the **geoid**. The geoid is a surface over which the earth's gravity is constant. (The geoid represents mean sea level.)



In summary, there are three models for describing geographic locations:

- the flat North, East model of the GIS, possibly with heights as well
- the curved local ellipsoid, used by the GIS as a model of the earth's surface locally
- the curved GRS-80 ellipsoid, used by GPS as a model of the earth's surface as a whole

These models can describe heights as being relative to either:

- an **ellipsoid**

or

- the **geoid** (mean sea level)

In order to collect the positions of features using GPS (and hence the WGS-84 datum) and then send them to a GIS as North, East coordinates, the GPS latitudes and longitudes need to be processed in a number of ways.

They need to be transformed from latitudes, longitudes, and altitudes on the WGS-84 datum into latitudes, longitudes, and altitudes on the local datum. This operation is called a datum transformation.

Once the coordinates are expressed as latitudes and longitudes on the local datum, they must then be projected into North and East values on a flat grid, using an operation called a map projection. Finally, if altitudes are to be stored by the GIS, they need to be transformed from heights above the GRS-80 ellipsoid to heights above some other reference level. The most common reference level is the geoid, more commonly referred to as mean sea level. The GeoExplorer 3 data collection system and Pathfinder Office software both contain a geoid separation model which enables them to transform altitudes relative to GRS-80 into heights relative to mean sea level.

The geoid separation models used by the GeoExplorer 3 and Pathfinder Office differ in accuracy. The GeoExplorer 3 is necessarily approximate, while Pathfinder Office is more accurate. If you require altitudes relative to a different reference level, or relative to a more accurate (perhaps local) mean sea level mode, you will need to process the heights in Pathfinder Office before exporting them to your GIS.

The GeoExplorer 3 lets you specify a datum transformation and a map projection, so that you can see your GPS position (and the position of features you may have recorded) in your local coordinate system. This makes it easy for you to check your position or navigate using a map produced by your GIS. It also allows you to specify that heights will be shown relative to your local ellipsoid, or relative to mean sea level.

For your convenience, the GeoExplorer 3 data collection system bundles up the complexities of datum transformations and map projections, and hides these complexities behind the common names for the coordinate systems with which you may be familiar. Each named coordinate system has an associated datum (which encapsulates an ellipsoid) and a number of zones (each of which is a named instance of a particular map projection).

You can create your own coordinate systems and sites using the Coordinate System Manager utility program in Pathfinder Office. With the set of pre-defined coordinate systems supplied by Trimble this should rarely be necessary.

Coordinate systems available on the GeoExplorer 3 data collection system

The GeoExplorer 3 and GeoExplorer 3c data collection system are supplied with two coordinate systems:

- Lat/Long – latitude, longitude, and height (above Mean Sea Level or Height Above Ellipsoid)
- UTM – northing, easting, and elevation

There are also over 100 datums already on the GeoExplorer 3. Most National Coordinate Systems are supported, and you can easily load these using the Data Transfer utility in the Pathfinder Office software.

NOTE You cannot use local sites.

NOTE The default geoid on the GeoExplorer 3 is the DMA 10x10 (Global) model. This is different from the default used by the Pathfinder Office software. As a result, MSL heights on the GeoExplorer 3 may differ to those displayed in the Pathfinder Office software.

NOTE You cannot load coordinate systems from the Pathfinder Office software to a GeoExplorer 3c edition.

Using Coordinate System Manager

Use the Coordinate System Manager utility, in Pathfinder Office, to create and edit custom coordinate systems for use with the GeoExplorer 3.

To use Coordinate System Manager:

1. On the office computer, start the Coordinate System Manager utility from Pathfinder Office.
2. Use the tabs in the main window to select or edit coordinate systems and zones.
3. Export the coordinate system database file. Select File/Export.

   The Export dialog appears.
4. Select the Select records only option in the Export dialog.
5. Click **OK**.

   The Save As dialog appears.
6. Specify the new file name and click **Save**.

When you have saved the coordinate system database files, and the related support files, use the Data transfer utility to transfer the coordinate system files to the GeoExplorer 3.

For more information refer to the Pathfinder Office online Help.

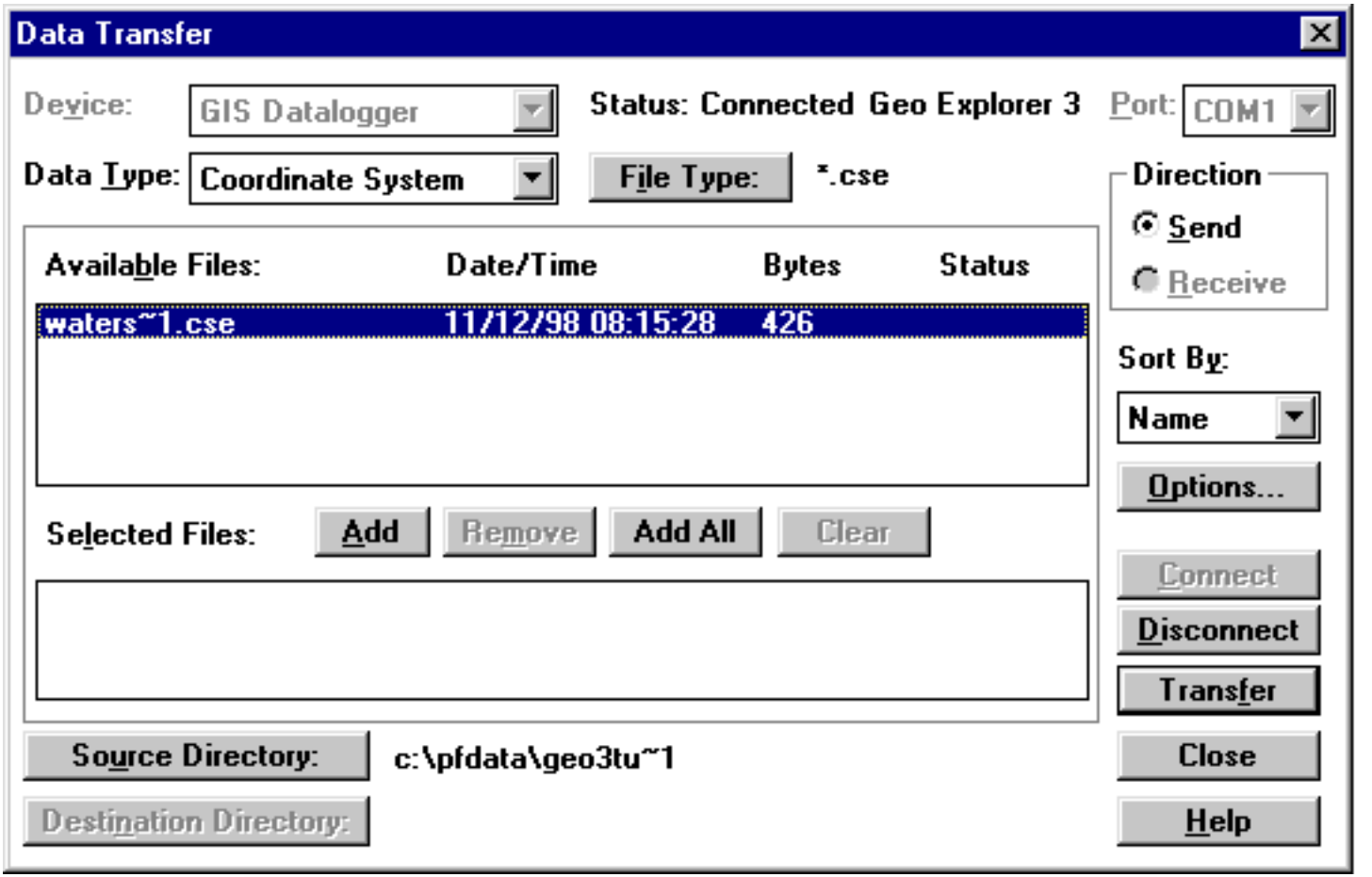
Transferring coordinate systems

Use the Data Transfer utilities, in the Pathfinder Office software, to transfer coordinate systems and grid files between the GeoExplorer 3 data collection system and the office computer.

To transfer coordinate systems and grid files:

1. Place the GeoExplorer 3 handheld in the support module. Make sure that the support module is connected to the office computer. Once the GeoExplorer 3 is in the **GeoExplorer 3 Support Module**, it is ready to transfer data files.
2. On the office computer, start the Data Transfer utility from Pathfinder Office.
3. Select the appropriate file type in the Data Type field. In this case, select Coordinate System or Grid Files.
4. In the Direction field choose Send.
5. Select the source folder (the folder where the files are located). By default, this will be the last folder used to transfer (send) a file. If necessary, press **Source Directory** to change the source folder.

6. Select one or more files to be transferred. To do this, highlight the name(s) of the file to be transferred in the Available Files field and then click **Add**.



7. Press **Transfer**. All files in the Selected Files field are transferred. (When the size of the a file(s) is greater than 200KB, you are prompted to confirm the transfer, as it will use up a considerable portion of the GeoExplorer 3's memory.)

NOTE You can also use the Configuration Manager software to specify which zone is to be transferred to the GeoExplorer 3 data collection system. The Configuration Manager can only transfer one zone. If you specify a zone and transfer this configuration, the appropriate Coordinate System Export file (.CSE file) is also transferred. Use Coordinate System Manager to transfer more than one zone.

For more information refer to the Pathfinder Office online Help.

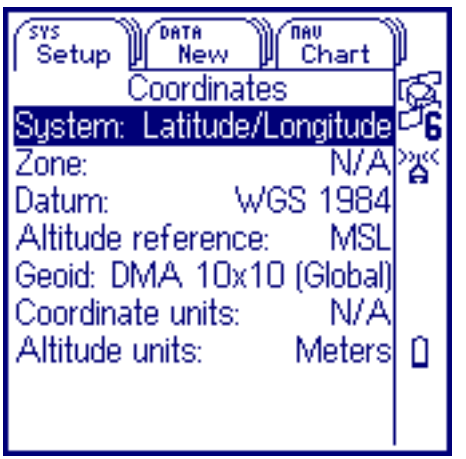
NOTE Trimble GPS Pathfinder® Office software contains pre-defined CSE files containing coordinate systems for a number of regions of the world (for example, America.CSE contains all the coordinate systems for the Americas). Using the Data Transfer utility, select Coordinate system in the Data Type drop down menu to display a list of pre-defined coordinate system files.

Configuring coordinate systems

You can use the Coordinates form to edit the coordinate system, zone, and datum parameters. The GeoExplorer 3 data collection system lets you specify a datum transformation and a map projection so that you can see your GPS position, and the position of features you collect, in your local coordinate system. This makes it easy for you to check your position or to navigate using a map produced by your GIS.

To configure the Coordinates form:

1. Press SYS until the Setup tab is active.
2. Select Configurations. The Edit configuration screen appears.
3. Select Coordinates. The Coordinates form appears:
4. Use this form to specify the coordinate system, zone, datum, altitude reference, and geoid. You can also specify the units used to display the coordinates and altitude. For more information see **Coordinates**.



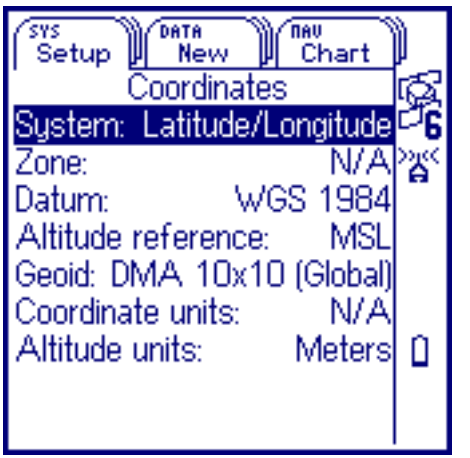
Resetting coordinate systems

You can remove the uploaded coordinate systems from the GeoExplorer 3. To do this reset the list of coordinate systems. All coordinate systems, except Latitude/Longitude and UTM, are removed.

To reset the list of coordinate systems:

1. Press SYS until the Setup tab is active.
2. Select Configurations.

   The Edit configuration screen appears.
3. Select Coordinates. The Coordinates form appears:
4. Highlight the System field and press OPTION.
5. Select Reset coordinate systems. You are prompted to confirm the reset.
6. Select Yes to remove the coordinate system file from the GeoExplorer 3. Latitude/Longitude becomes the new current system. Select No to cancel the reset operation.



NOTE You cannot delete Latitude/Longitude or UTM from the list.

REFERENCE

This Reference provides detailed information about screens that appear when you use the GeoExplorer 3 data collection system.

General operation describes different ways to interact with the GeoExplorer 3. It also explains how to use the keys and screens. Other topics correspond to different areas of the software.

The GeoExplorer 3 software is arranged in three “sections”:

- **THE SYS SECTION**
- **THE DATA SECTION**
- **THE NAV SECTION**

General operation

General operation contains detailed information about the GeoExplorer 3 user interface and data entry methods. Topics are:

- Turning the GeoExplorer 3 handheld on and off
- Adjusting the display
- Rebooting the GeoExplorer 3 handheld
- Main menu
- The GeoExplorer 3 display
- Status bar
- Interacting with the GeoExplorer 3 data collection system
- Password control

Turning the GeoExplorer 3 handheld on and off

This explains how to turn the GeoExplorer 3 handheld on and off.

On

To turn on the GeoExplorer 3 handheld press ⏻ (the On/Off key). A Trimble identification screen appears for a few seconds while the GeoExplorer 3 performs a self-test. This is replaced by the GPS tab. The GeoExplorer 3 data collection system always returns to the GPS tab when turned on.

Off

To turn off the GeoExplorer 3 handheld press and hold ⏻ (the On/Off key) for one second.

Adjusting the display

This explains how to adjust the screen contrast and backlight mode.

- **Backlight**
- **Screen contrast**

Backlight

The GeoExplorer 3 handheld displays information on an LCD screen. The screen is easiest to read when viewed directly from the front.

The screen can be backlit to make viewing easier in poor light conditions. The backlight is always off when the GeoExplorer 3 is turned on. The backlight can be changed to one of three states by pressing Fn DATA. The states are Off, Normal, and Bright. When the backlight is in the normal or bright state, an icon appears in the **Status bar**.

CAUTION Operating the backlight uses more power.

Screen contrast

Depending on viewing conditions, you may need to adjust the screen contrast. To lighten the screen contrast press Fn SYS. To darken it, press Fn NAV.

Rebooting the GeoExplorer 3 handheld

If the GeoExplorer 3 handheld locks up and does not respond to key presses you need to perform a warm boot. This causes the GeoExplorer 3 hardware to shut down.

NOTE Whenever possible, before rebooting, transmit any data in the GeoExplorer 3 handheld to an office computer.

Warm boot

To perform a warm boot on the GeoExplorer 3, press  and hold down for 10 seconds. The GeoExplorer 3 turns off. Press  again to turn it on.

NOTE This procedure causes the GeoExplorer 3 hardware to perform a warm boot. No data loss should occur as a result of performing this procedure.

Cold boot

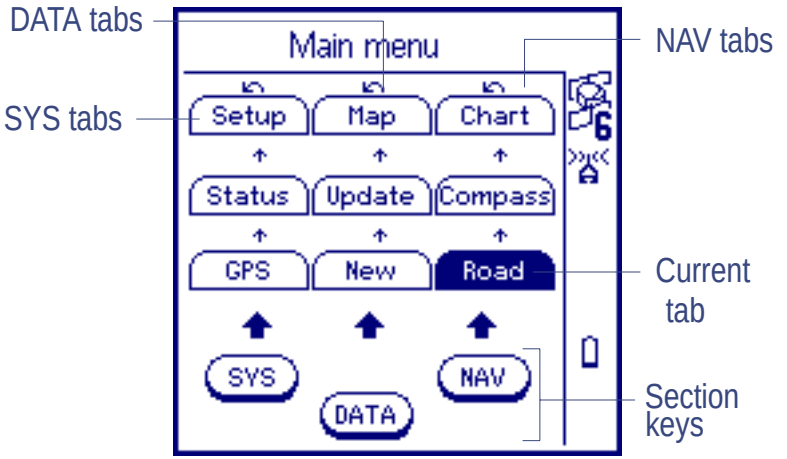
To perform a cold boot turn the GeoExplorer 3 handheld on. The Trimble logo starts spinning. While the logo is spinning, press ENTER and DATA simultaneously.

NOTE Once the logo stops spinning and the first screen is displayed, it is too late to attempt a cold boot. Repower the unit and try again.

WARNING This procedure clears the memory of the GeoExplorer 3. It will remove any data file, configurations, data dictionary, waypoints, or coordinate systems you may have loaded onto the GeoExplorer 3.

Main menu

Use the Main menu to move around the system and view sections and their corresponding tabs. Press Fn OPTION to display the Main menu.



Use the arrow keys to move around the Main menu. The tab that is currently active is the highlighted tab. Press ENTER to close the Main menu and go to the current tab.

For example, to move from the Chart tab to the Status tab, use the arrow keys to highlight the Status tab and then press ENTER.

NOTE When no data file is open, the only tab available in the DATA section is File. When a data file is open the New, Update, and Map tabs are all available.

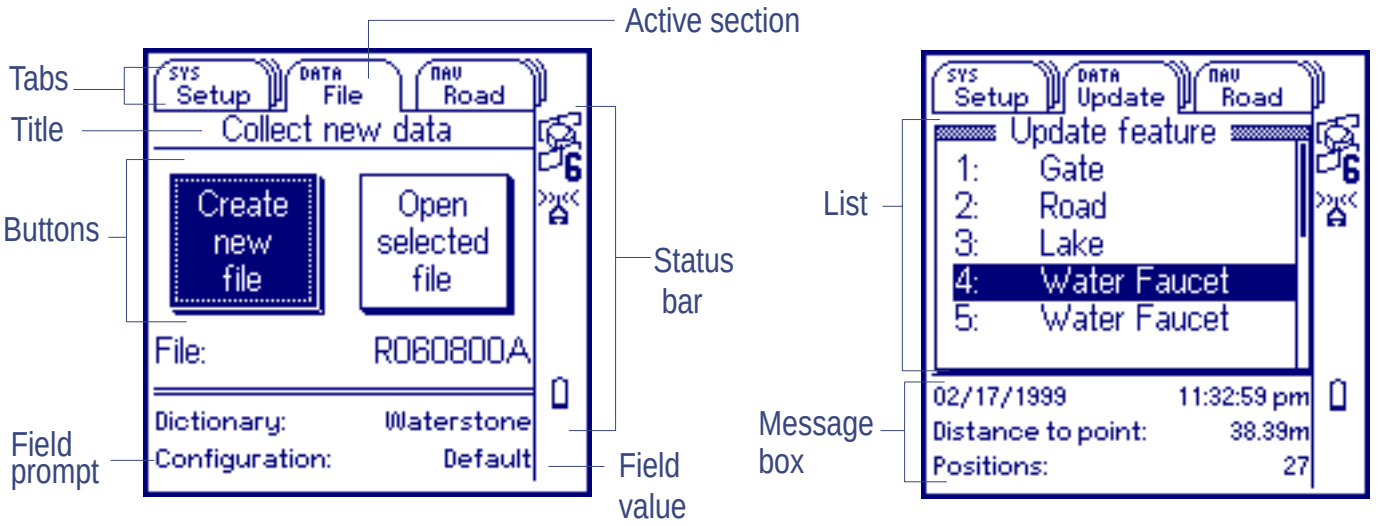
NOTE The Map and Chart tabs are not available in the GeoExplorer 3c edition.

This table summarizes each of the tabs:

	Use this tab ...	To ...
SYS	GPS	View information about the satellites that the GeoExplorer 3 is tracking and their relative positions in the sky, and to see your current position.
	Status	View information about the GeoExplorer 3 hardware, accessories, and external connections.
	Setup	Create and edit data dictionaries and feature settings. Also, use this tab to edit the configuration. You can reset the GeoExplorer 3 data collection system to the factory defaults.
DATA	File	Create a new data file or open an existing one.
	New	Collect new features and attributes.
	Update	Update features and attributes.
	Map	View features and select them for update.
NAV	Road	Navigate to features and waypoints using the Road.
	Compass	Navigate to features and waypoints using the Compass.
	Chart	Navigate to features and waypoints using the Chart.

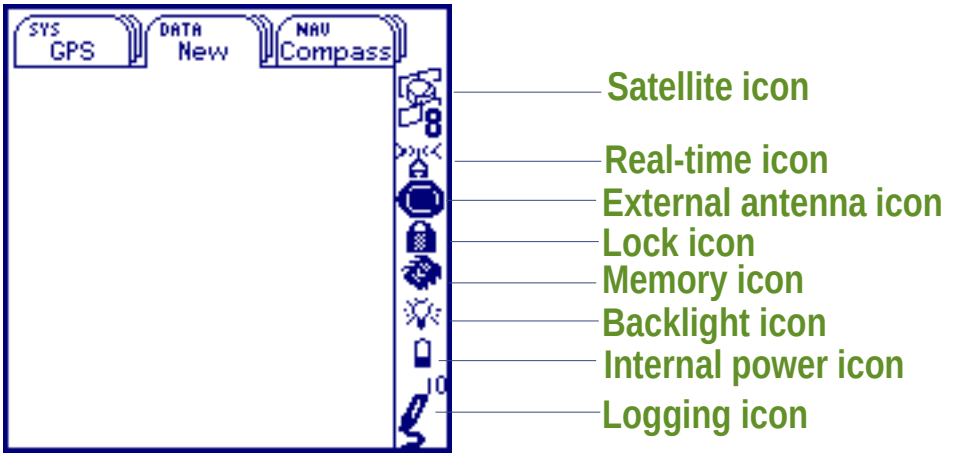
The GeoExplorer 3 display

Some common displays are shown here to describe features of the GeoExplorer 3 firmware.



Status bar

The status bar appears in the column on the right. It is always visible, but the icons displayed depend on the current status of the system. It provides basic information about the status of the GeoExplorer 3 data collection system.



Icon	Name	Description
	Satellite icon	Shows whether the geometry of the satellites is good or bad depending on the GPS configuration settings. This icon is always visible in the status bar. When the GeoExplorer 3 data collection system is computing GPS positions the number below the satellite icon indicates how many satellites are being used to compute positions. The satellite icon flashes to warn you that the geometry of the satellites is poor. The number flashes to indicate that too few satellites are available. You need a minimum of four satellites to compute GPS positions.
	Real-time icon	Show that the GeoExplorer 3 is computing real-time positions. The real-time icon flashes when the **RTCM** signal is lost. RTCM details are displayed on **The Status tab**. To configure the real-time settings use the **Real-time** button.

Icon	Name	Description
	External antenna icon	Shows whether the external antenna is properly connected. When an external antenna is connected this icon appears. If it does not appear, there is a problem with the connection. The antenna (internal and external) details are displayed on the Status tab.
	Lock icon	Shows that a configuration setting or task is locked. To unlock it you must have **Password control**.
	Memory icon	Shows that the memory level is low (< 100 kB). This icon flashes when the remaining memory is critically low (< 10 kB)). The memory details are shown on the Status tab

Icon	Name	Description
 Normal  Bright	Backlight icon	Shows that the **Backlight** is on. The backlight has two different states: Normal and Bright. When the backlight is off no icon is visible. To change the state of the backlight press Fn DATA.
	Internal power icon	Shows the level of the internal power source. This icon is always visible in the status bar. The battery icon appears full when the level of the power source is high. As the level of the power source decreases, the level shown by the battery icon decreases. The icon flashes to warn you that the level is low. The battery icon appears to be filling when the internal power is being charged. Power source details are displayed on **The Status tab**.

Icon	Name	Description
 Normal	Logging icon	Shows whether the GeoExplorer 3 is successfully logging GPS positions. This icon appears to be drawing when successfully logging GPS data. The number displayed above the icon indicates how many positions have been logged for the current feature. The icon will flash if conditions do not meet the specified GPS configuration. The logging icon has three different states: • Normal – the GeoExplorer 3 is logging **code phase (C/A code)** measurements. • Paused – the GeoExplorer 3 has paused while logging GPS positions. When logging is paused, the GeoExplorer 3 stops recording GPS positions and this icon flashes. When you start logging again, the GeoExplorer 3 resumes logging GPS positions and the icon reverts to the logging icon. • Logging carrier – the GeoExplorer 3 is logging carrier phase measurements for **Carrier phase data collection** or for a base station. Use the **Feature settings** button to configure a feature for carrier accuracy.
 Paused		
 Logging carrier		

Interacting with the GeoExplorer 3 data collection system

You can interact with the GeoExplorer 3 data collection system in a variety of ways. The following topics describe the keypad and the different types of displays:

- **Keys**
- **Screens**
- **Lists**
- **Forms**
- **Option lists**
- **Pop-up messages**
- **Data entry**

Keys

This table explains the various keys on the GeoExplorer 3 handheld.

Key	Name	Use this key to ...
	Power On/Off	power the GeoExplorer 3 handheld on and off. Also used to activate the GeoExplorer 3 when in standby mode in the GeoExplorer 3 Support Module.
	SYS section	move from DATA or NAV sections to an active tab in **THE SYS SECTION**. If you are already in the SYS section then pressing  cycles through the SYS tabs.
	DATA section	move from SYS or NAV sections to an active tab in **THE DATA SECTION**. If you are already in the DATA section then pressing  cycles through the DATA tabs.

Key	Name	Use this key to ...
NAV	NAV section	move from SYS or DATA sections to an active tab in **THE NAV SECTION**. If you are already in the NAV section then pressing NAV cycles through the NAV tabs.
◁ ▷	Arrow keys	move the cursor or highlight.
△ ▽	Arrow keys	move the cursor or highlight. Scroll through numeric digits in a numeric entry field.
CLOSE	Close	close the current display. This includes closing and saving features and data files. Also press CLOSE to move up sub levels.

Key	Name	Use this key to ...
ENTER	Enter	select the highlighted item. Press ENTER whenever you want to choose an item from a list or open a field to edit.
LOG II	Log	start, pause, or resume GPS logging. LOG II can be used to control logging from almost any place throughout the GeoExplorer 3 data collection system. Use of the LOG II key is explained in **Collecting data** and **Advanced datalogging options**.
OPTION	Option	display the list of advanced options that are available from your current screen. Most screens have one or more advanced options available via OPTION.

Key	Name	Use this key to ...
Fn	Function	access the secondary function of certain keys. These functions are shown in blue on the keypad. To use a secondary function, press Fn and then press the secondary function key. You do not need to hold down the keys at the same time.

Function	Use this key combination ...	To ...
Cancel	Fn CLOSE	close the current screen and cancel any changes. This includes changes to GPS or feature attributes. You may be prompted to confirm the cancel operation.
Menu	Fn OPTION	go to the **Main menu**. Use the arrow keys to select the tab you want to go to, then press ENTER. Alternatively, press SYS, DATA, or NAV to go directly to the appropriate screen.
Decrease contrast	Fn SYS	lighten display contrast.
Backlight	Fn DATA	control the backlight. There are three settings—Bright, Normal, and Off.

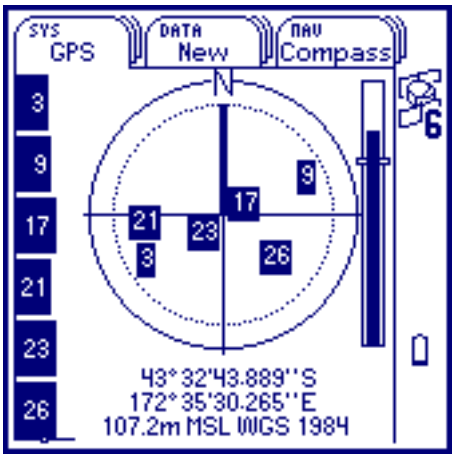
Function	Use this key combination ...	To ...
Increase contrast	Fn NAV	darken display contrast.
Page up	Fn △	page up. Move the cursor to the top of the current display. Also moves the Map cursor half a screen upwards.
Page down	Fn ▽	page down. Move the cursor to the bottom of the current display. Also moves the Map cursor half a screen downwards.
Home	Fn ◁	return to the beginning of a list or form. Useful in long lists and forms. Also moves the Map cursor half a screen to the left.

Function	Use this key combination ...	To ...
End	Fn >	return to the end of a list or form. Useful in long lists and forms. Also moves the Map cursor half a screen to the right.

NOTE For more information see **Using the GeoExplorer 3 data collection system**.

Screens

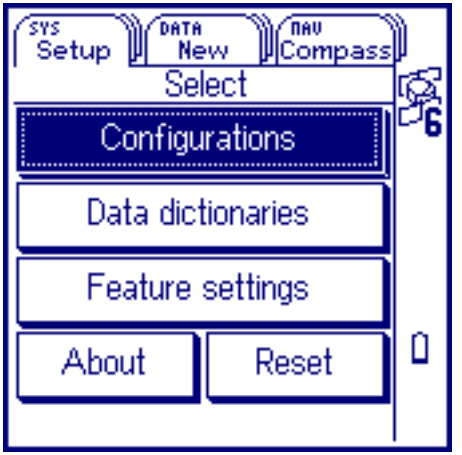
In the GeoExplorer 3, the top level “screens” for each tab are generally graphical and provide quick visual feedback. They have an advanced mode that lets you view the information in a text format. Alternatively, a screen contains buttons that let you access other displays.



This example shows the GPS screen in the GPS tab. You can view this screen in different modes. This example shows the Standard mode.

Press OPTION to change to Advanced mode, and again to return to Standard mode.

This example shows a screen with buttons. This is the Select screen in the Setup tab.

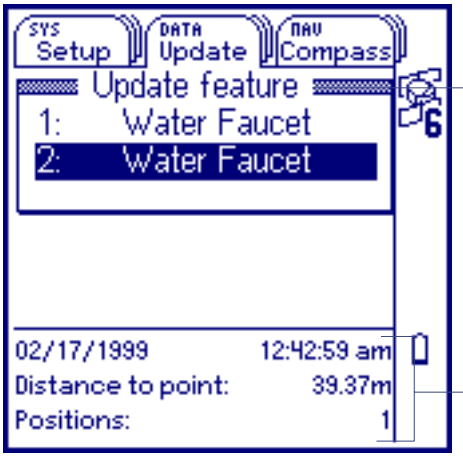


Buttons provide access to other areas of the GeoExplorer 3 data collection system. To select a button from a screen, use the arrow keys to highlight it and then press ENTER.

Use screens to view information graphically or to select buttons that provide access to other areas in the firmware. You cannot enter data in a screen, and you cannot edit the information displayed.

Lists

When selecting data files, data dictionaries, features, or waypoints the GeoExplorer 3 provides a “list”. A list contains the information that is currently stored and available in the GeoExplorer 3 data collection system. A list always has a title that describes the items.



This is the Update feature list, as shown in the title bar. This list displays all features stored in the current data file. To select an item from a list, use the arrow keys to highlight the item and press ENTER.

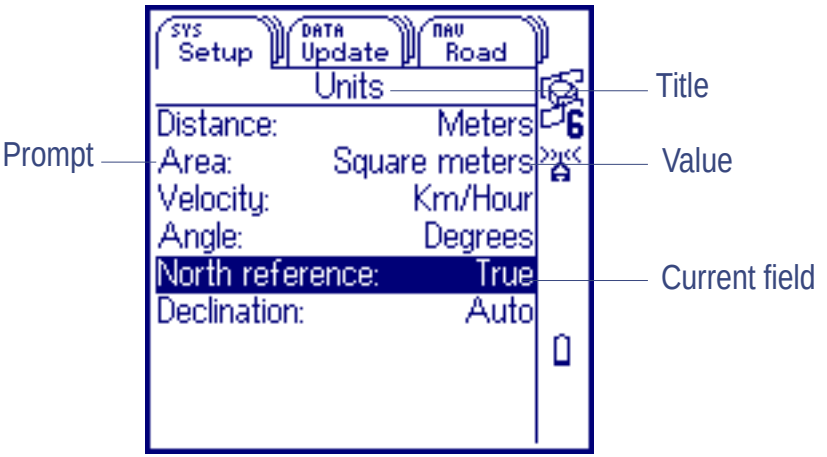
Often a message box is displayed at the bottom of the screen, below the list. The message box provides useful information about the item currently highlighted in the list. To close a list press CLOSE.

Press Fn △ or Fn ▽ to move the highlight up or down the list, one page at a time.

Press Fn ◁ or Fn ▷ to move to the first or last item in the list.

Forms

Data entry in the GeoExplorer 3 data collection system takes place in “forms”. These are like paper forms, in that they have a title and a sequence of lines or fields.



Use a form to enter information.

Each field generally has two parts, a prompt (or name) and a value. A prompt is followed by a colon (:) that separates it from the value. Some fields are separator fields, which have no value and serve simply to divide a form into sections.

One field in every form is the current field. It is distinguished by being highlighted. Any editing operations on a form apply to the current field. To edit a field, select it by highlighting it and pressing ENTER.

There are three ways to enter data into a form:

- **Text entry**
- **Numeric entry**
- **Pop-up list**

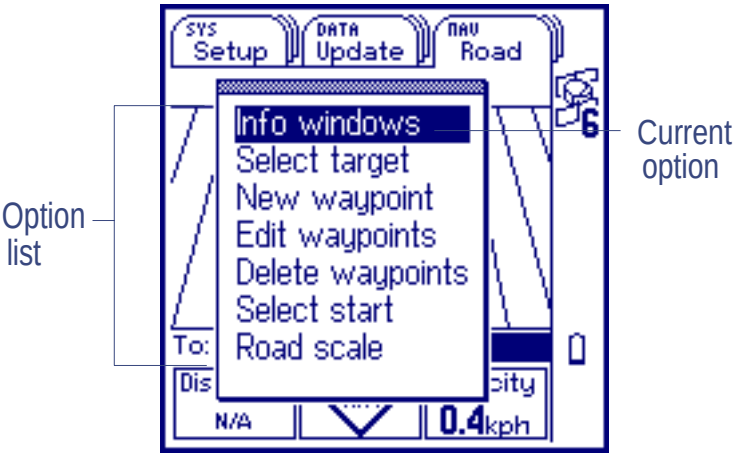
A form is “live”. When you edit a field, the new value takes effect as soon as the change is made.

Press Fn △ or Fn ▽ to move up or down the form, one page at a time. This is equivalent to page up and page down. Use Fn ◁ or Fn ▷ to move to the first or last field in the form. This is equivalent to Home and End.

When you have finished browsing through the form, or have finished editing a field in the form, press CLOSE to return to the previous screen or list. When a feature attribute entry form is open, you can also press Fn CLOSE to abandon the feature.

Option lists

Option lists display additional functionality. In some places in the firmware you can press the OPTION key to display the options. For example, press OPTION when the Road tab is active. The following options appear:



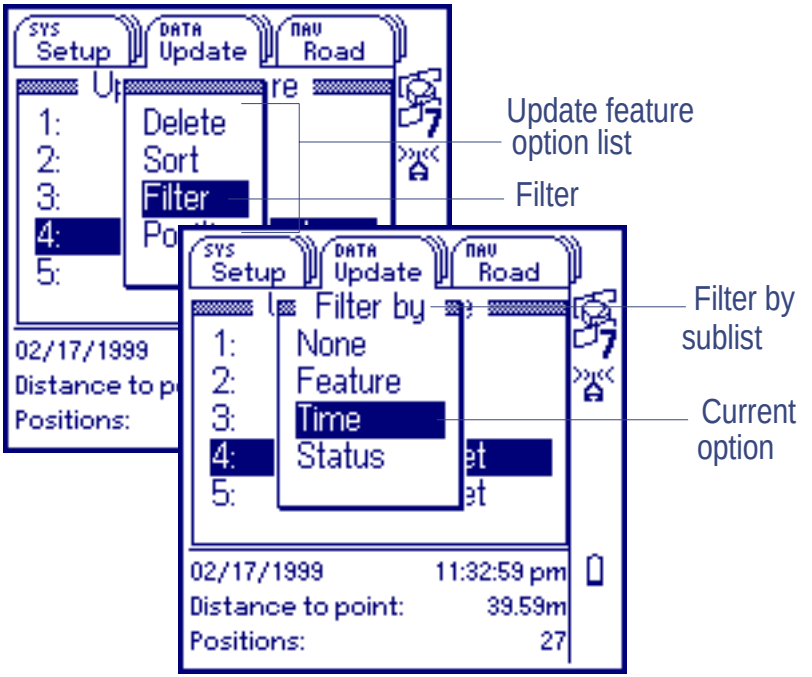
The current option in a list is highlighted. To select a different option, press △ or ▽ to move the highlight and then press ENTER.

If an option list has more options than fit on one screen, a scroll bar appears on the right. Use △ or ▽ to scroll up and down the list.

Press Fn △ or Fn ▽ to move the highlight up or down the option list, one page at a time. Press Fn ◁ or Fn ▷ to move to the first or last option in the list. To close an option list press OPTION again, or press CLOSE.

Sublists

Some options open into a sublist. A sublist relates to that option. For example, if you select the Filter option from the Update feature option list, the Filter by sublist appears:



The current option in a sublist is highlighted. To select a different option, press △ or ▽ to move the highlight and then press ENTER.

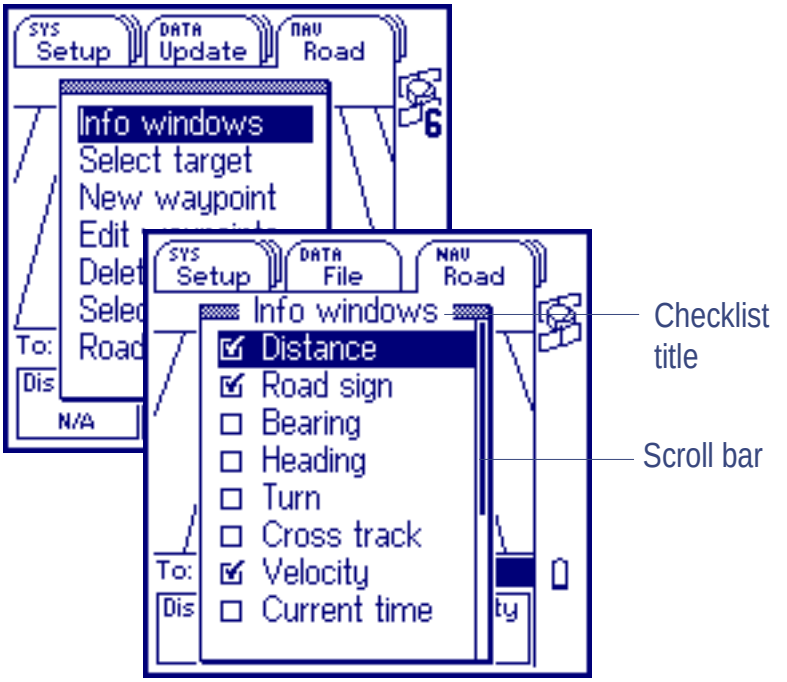
Press Fn △ or Fn ▽ to move the highlight up or down the sublist, one page at a time. Use Fn ◁ or Fn ▷ to move to the first or last option in the sublist. To close a sublist press CLOSE.

Checklists

Some option lists open into a checklist. If you select Info windows from the Road option list, for example, the Info windows checklist appears:

To select an item in a checklist, use the arrow keys to highlight it and then press ENTER. When it is selected a ✓ appears in the box on the left. To clear a ✓, use the arrow keys to highlight the item and press ENTER. The ✓ is removed.

To close a checklist and save your changes press CLOSE. To cancel any changes press Fn CLOSE.

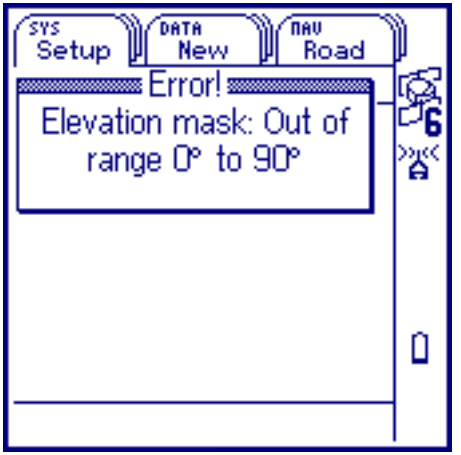


NOTE All option lists, sublists, forms, and checklists scroll in a cyclical fashion. If you position the highlight on the first (top) option in the list and press △ the highlight moves to the last (bottom) option. Similarly, if you position the highlight on the last option and press ▽ the highlight moves to the top option.

Pop-up messages

Occasionally, a message “pops up”. When the GeoExplorer 3 asks a question, a message pops up with two buttons, one of which you select in response. To do this, press ◁ or ▷ to highlight your response and then press ENTER.

TIP Press CLOSE to select No for Yes/No questions.



The Error screen is another example of a pop-up message. **`Warning!`** and **`Error!`** messages should be noted, because they contain important information about the task you are trying to perform.

To clear a message from the screen press CLOSE.

For more information see **GeoExplorer 3 messages**.

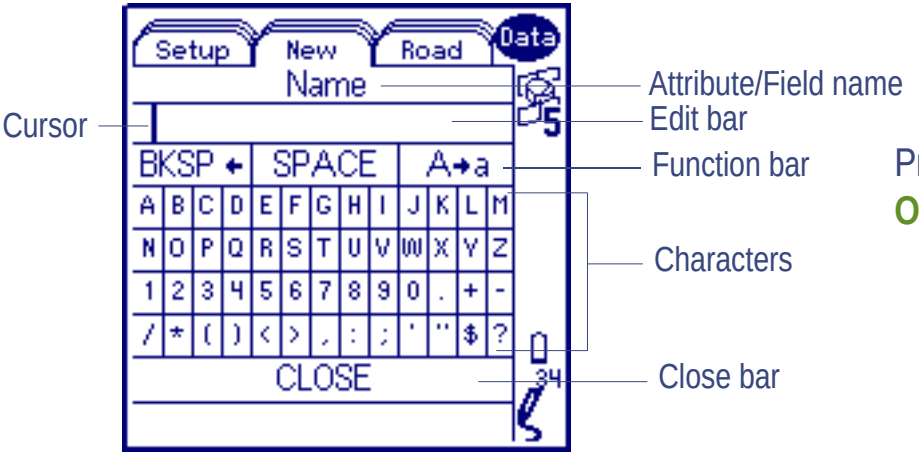
Data entry

There are three ways to enter data. The methods available depend on the type of data to be entered:

- **Text entry**
- **Numeric entry**
- **Pop-up list**

Text entry

You can enter text using the text entry field.



Press OPTION to view the **Option list**.

Use the Edit bar and characters to enter text. The text entry field contains the following:

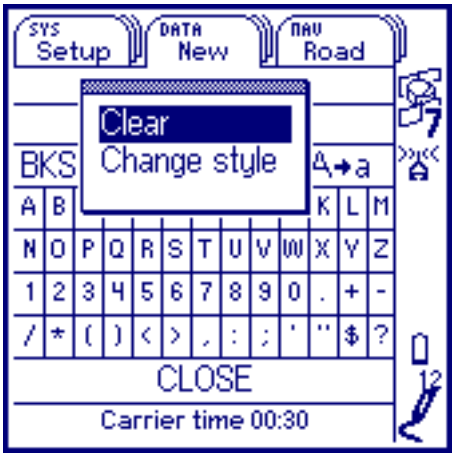
- **Attribute/Field name**
- **Characters**
- **Edit bar**
- **Close bar**
- **Function bar**

Use this area ...	To ...
Attribute/Field name	View the name of the selected attribute or field.
Edit bar	Enter or change the text value. The cursor flashes to indicate its current location in the Edit bar.
Function bar	• Use **BKSP** ← to delete characters to the left of the cursor. To backspace use the arrow keys to highlight the **BKSP** ← function and then press ENTER. • Use **SPACE** to insert a space in the Edit bar. Use the arrow keys to highlight the **SPACE** function and then press ENTER. • Use the **A→a** function to change characters from uppercase to lowercase (and vice versa). Use the arrow keys to highlight the **A→a** function and then press ENTER.
Characters	Select the characters for the text entry. To insert a character in the Edit bar, use the arrow keys to highlight the desired character and then press ENTER.

Use this area ...	To ...
Close bar	Close the text entry field and save any changes. To save the entry in the Edit bar, use the arrow keys to highlight **Close** (at the bottom of the keypad) and then press ENTER. You can also press CLOSE from anywhere in the form to save the new text and go to back to the previous form. To cancel any changes and restore the original value, press Fn CLOSE.

Option list

Press OPTION, from the text entry field, to view the options.



The options are:

- **Clear**
- **Change style**

Use this option...	To...
Clear	Clear (delete) the text that is currently entered in the Edit bar.
Change style	Change the layout of the characters that you can select. Choose from ABCDEF and QWERTY.

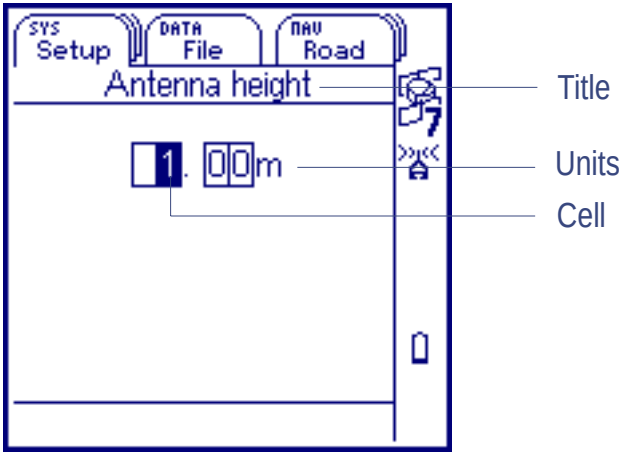
Numeric entry

There are two types of numeric entry fields that you can enter data into.

- **Single numeric entry**
- **Multiple option numeric entry**

Single numeric entry

When you select a numeric field that requires single numeric entry, a field similar to this appears:



It contains a title, units and numeric cells.

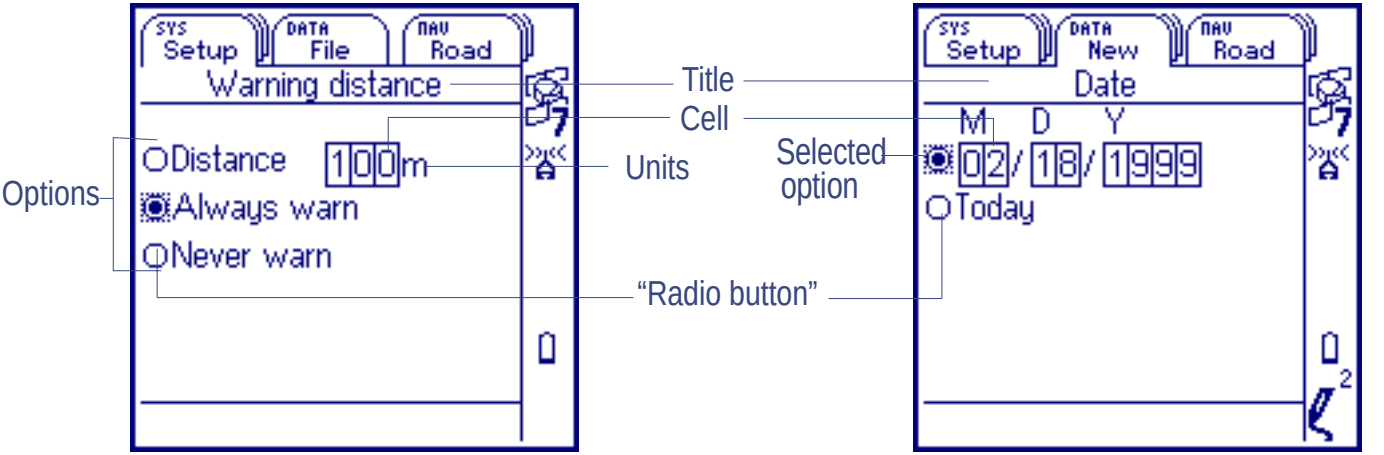
To enter a value, press ◁ or ▷ to highlight a cell. When a cell is highlighted press △ or ▽ to scroll the value in the cell from 0 to 9. The cells are independent of each other. Press ENTER to save the new value. When you press ENTER the value entered becomes the new value for the selected field. You can also press CLOSE to close the numeric entry "field" and save changes.

To cancel changes and restore the original value (before you changed it) press Fn CLOSE.

NOTE The cells scroll in a circular fashion. When the value in the cell is 9, press ▽ to change the value to 0. When the value in the cell is 0, press △ to change the value to 9.

Multiple option numeric entry

When you select a numeric field that has multiple options, a field similar to one of these appears:



In the Warning distance field shown here, there is a title, units, numeric cells, and three options. Each option has a corresponding "radio button". The selected option has a highlighted radio button surrounded by a shaded box. In this example, Always warn is the selected option.

To change the option that is selected, press △ or ▽ until the corresponding radio button is highlighted.

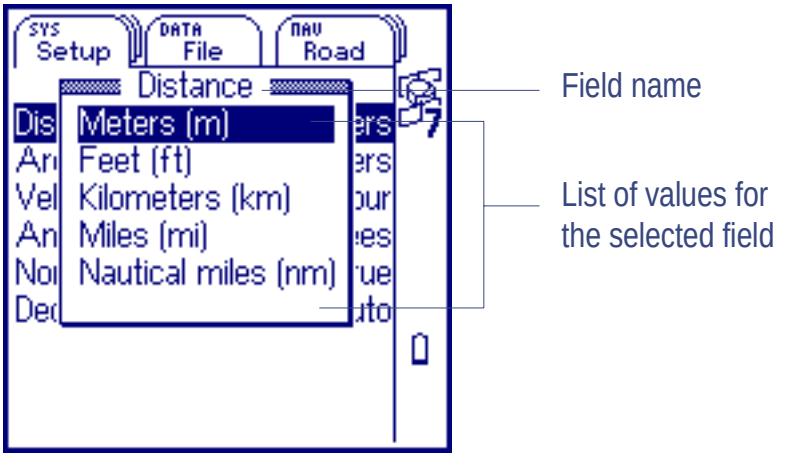
To change the value for the selected option, press ◁ or ▷ to highlight a numeric cell. When you highlight a cell, the shaded box around the corresponding radio button disappears to indicate that a numeric cell is selected. With a cell highlighted press, △ or ▽ to scroll the number in that cell from 0 through 9. To move between cells, press ◁ or ▷. The cells are independent of each other. Press ENTER to save the new setting. When you press ENTER the value of the selected option becomes the new value for the field. You can also press CLOSE to close the numeric entry field and save changes.

To cancel changes and restore values to the original setting (before your changes) press Fn CLOSE.

NOTE Values in a cell scroll in a cyclical way. When the value in the cell is 9, press ▽ to change the value to 0. When the value in the cell is 0, press △ to change the value to 9.

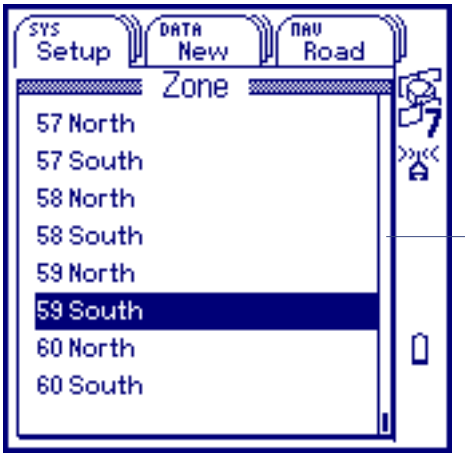
Pop-up list

When you select a field that has many possible values, a pop-up list appears:



The current value in a pop-up list is highlighted. To select a different value, press △ or ▽ to move the highlight and then press ENTER.

If a pop-up list has more options than fit on one screen, a scroll bar appears on the right. Use △ or ▽ to scroll up and down the list.



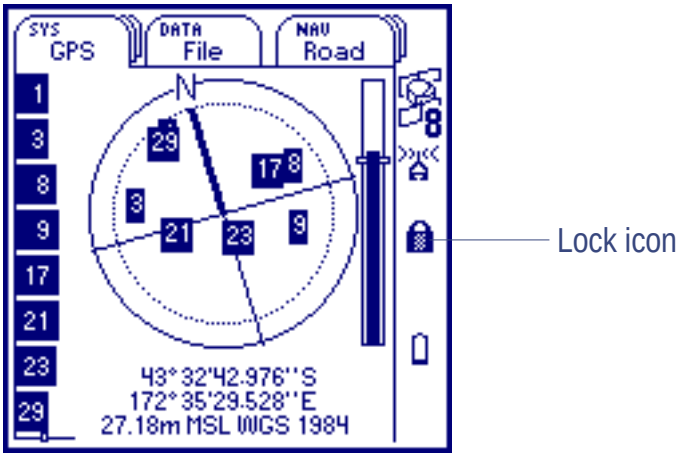
NOTE A pop-up list scrolls in a cyclical way. If you position the highlight on the first (top) value in the list and press △ the highlight moves to the last (bottom) value. Similarly, if you position the highlight on the last value in the list and press ▽ the highlight moves to the top value.

Password control

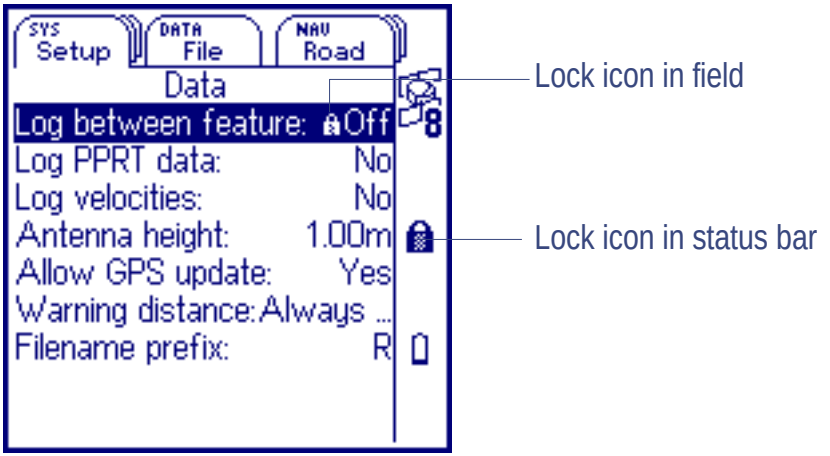
To lock configuration settings and tasks on the GeoExplorer 3 data collection system, you can set a password. Use the Configuration Manager in the GPS Pathfinder® Office software to indicate which configuration settings and tasks are to be locked. For more information refer to the Pathfinder Office online Help.

Locking and unlocking is useful when you do not want certain settings to be changed. If you create a configuration for a certain job and you do not want some settings to be altered, lock them by applying a password.

When configuration settings or tasks are locked, a lock icon appears in the **Status bar**.



When a field is locked, the lock icon appears to the left of the field value as well as in the status bar.

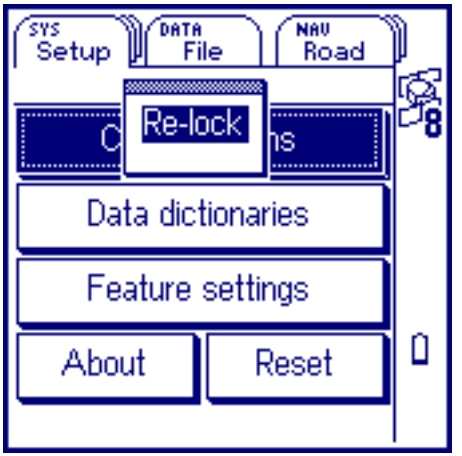


To edit a locked field, select it. (Highlight the field and press ENTER.) You are prompted to enter the password using **Text entry**. If you enter the correct password the field unlocks and you can edit the field.

NOTE If a configuration setting or task is locked, the GeoExplorer 3 data collection system remains password locked when turned off.

Re-lock option

If you need to make changes to a locked task or configuration setting, you can remove the lock. To prevent further changes, lock the field again afterwards. To do this, press OPTION from the top level of **The Setup tab** (the Select screen) and select Re-lock.



THE SYS SECTION

Use the SYS section to view GPS satellite information, check your current position, check the hardware status, and determine the quality of the GPS signal being received. Use it to configure the GeoExplorer 3 data collection system settings, create or edit data dictionaries, and alter feature settings.

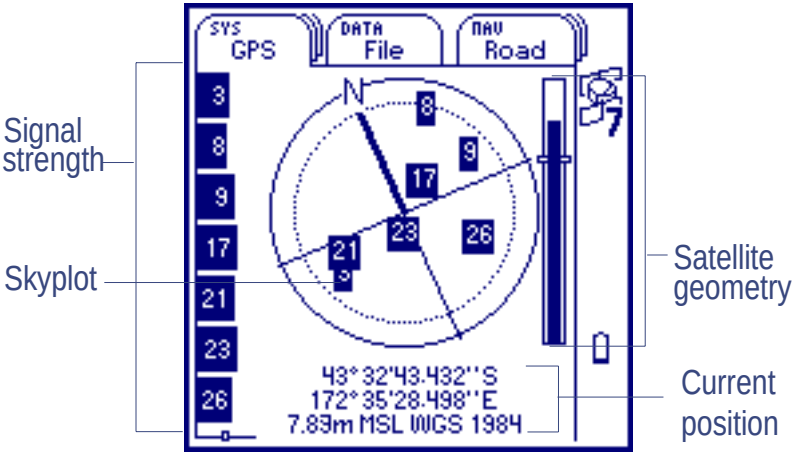
Press SYS to move between the tabs in the SYS section. They are:

- **The GPS tab**
- **The Status tab**
- **The Setup tab**

The GPS tab

SYS / GPS

To display the GPS tab, press SYS until the GPS tab is active. The Standard mode screen appears:



Use the GPS tab to view information about the satellites that the GeoExplorer 3 is tracking, and their relative positions.

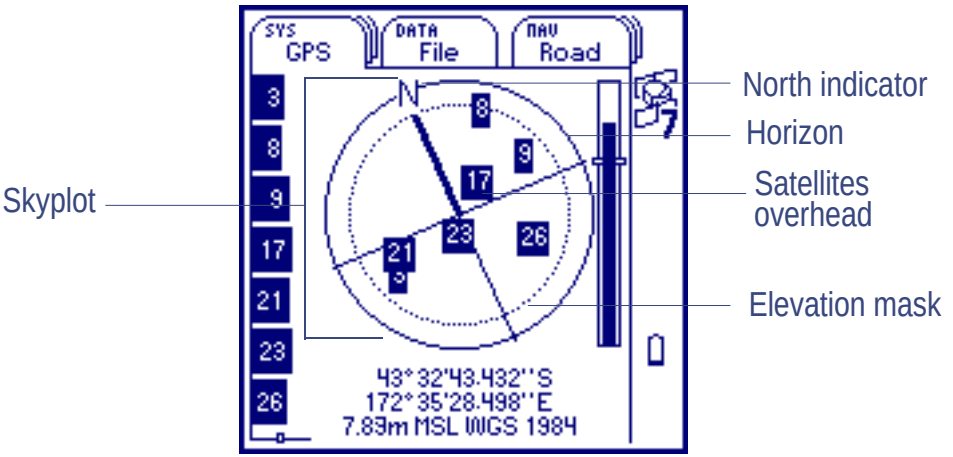
Press OPTION to view the **Advanced mode**.

The Standard mode of the GPS tab is a graphical view of the GPS status. It contains:

- **Skyplot**
- **Satellite geometry**
- **Current GPS position**
- **Signal strength**

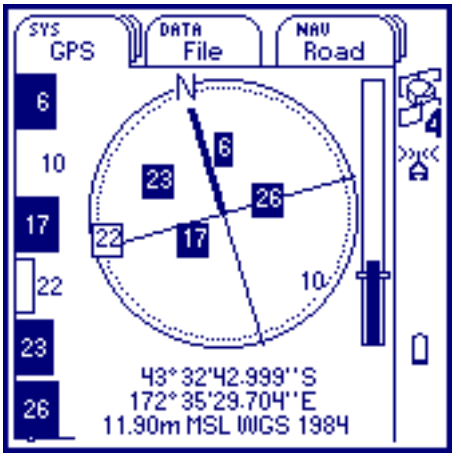
Skyplot

The skyplot provides a graphical display of the position of the satellites available to the receiver:



The outer circle represents the **horizon** (at 0°). The inner circle represents the configured **Elevation mask**. When the elevation mask is changed, the inner circle of the skyplot moves accordingly. If the elevation mask is increased, the inner circle gets smaller and only those satellites higher in the sky are used to compute GPS positions. If the elevation mask is decreased, the inner circle gets larger and satellites closer to the horizon are used to compute GPS positions.

Numbered boxes represent the satellites currently available to the GeoExplorer 3 data collection system. The satellites near the center of the circle are higher in the sky (overhead), while those toward the edge are closer to the horizon. The location of any one satellite can be determined by noting its direction (N, S, E, W) and approximate elevation in the skyplot.



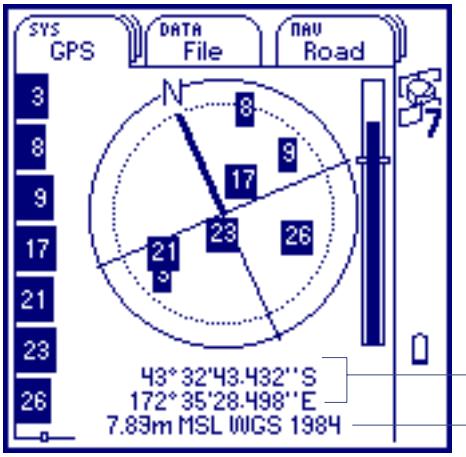
Satellites shown as black boxes are currently being used by the GeoExplorer 3 to compute GPS positions. Satellites with clear boxes are being tracked, but are not being used to compute positions. Satellites with no boxes are available, but are not being tracked by the GeoExplorer 3.

The skyplot rotates (like a compass) to indicate what direction the GeoExplorer 3 is pointing in.

NOTE The skyplot only rotates if you are moving at a brisk walking speed or faster, or if you have calibrated the internal digital compass. For more details, see **Calibration**.

Current GPS position

The current GPS position is shown at the bottom of the GPS tab. It displays the coordinates, altitude, and **datum**:



Coordinates

Altitude and datum

The GeoExplorer 3 searches the sky for satellite signals. It then determines which to use to compute the current GPS position, based on the configured **GPS** settings. The GeoExplorer 3 needs a minimum of four satellites to compute GPS positions.

Values are displayed in terms of the currently configured coordinate system and datum. If the datum name is too long, it appears truncated. To change this configuration use the **Coordinates** form.

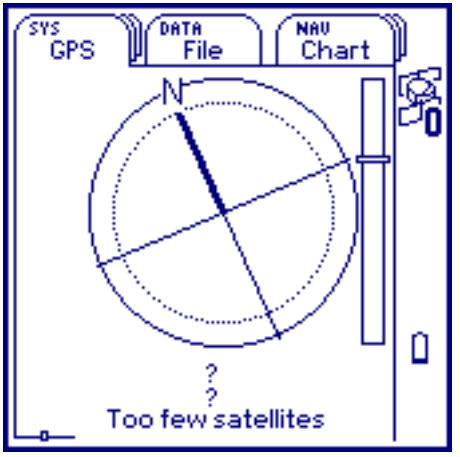
For more information see **Coordinate systems**.

NOTE Positions viewed on the screen are not saved. To save them, open a data file and start a feature or create a waypoint.

Message box

The message box at the bottom of the screen displays a descriptive message when the GeoExplorer 3 data collection system is not successfully computing GPS positions.

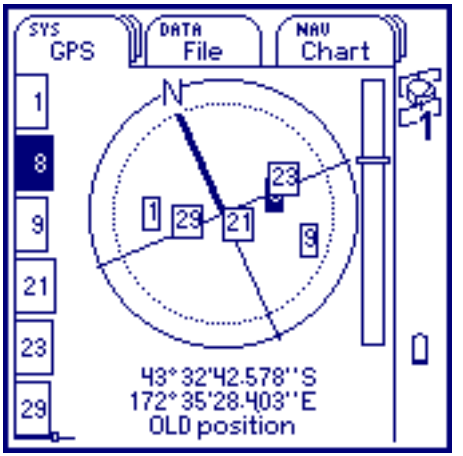
When you turn the GeoExplorer 3 on, it begins to track visible satellites and to calculate the current position. It takes up to 45 seconds to calculate the first position. While the first position is computed, a **?** appears in place of the current GPS position.

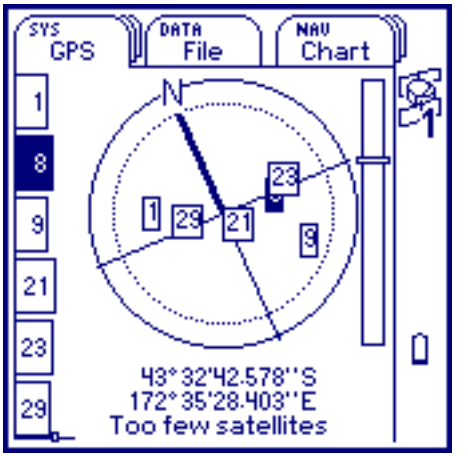


TIP If no positions are computed, look for obstructions that might be blocking satellite signals. Move away from any possible obstructions. If the GeoExplorer 3 is still not computing positions, see **Troubleshooting**.

Once the first position is displayed, subsequent positions are displayed once per second.

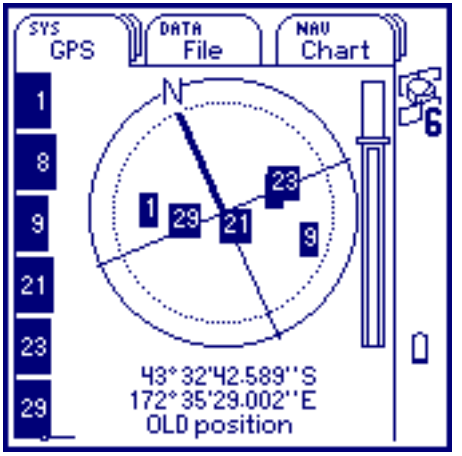
If the GeoExplorer 3 stops computing positions because too few satellites are available, two warning messages alternate in the message box. These messages indicate that the GPS position displayed is an old position and that there are too few satellites to compute a new one.

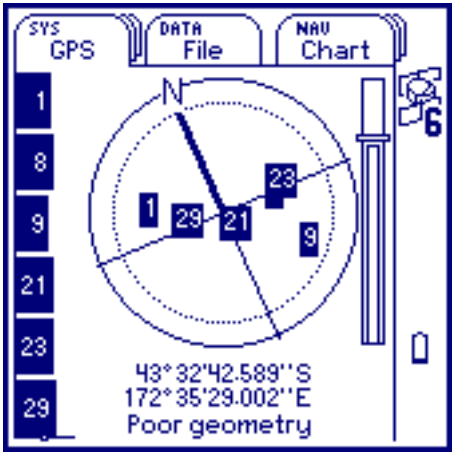




NOTE When there are too few satellites to compute GPS positions, the number below the satellite icon in the **Status bar** flashes. This icon is always visible, even when the GPS tab is not active.

If the GeoExplorer 3 stops computing positions because satellite geometry is poor, two warning messages alternate in the message box. These messages indicate that the GPS position displayed is an old position and that the geometry of the satellites is poor.



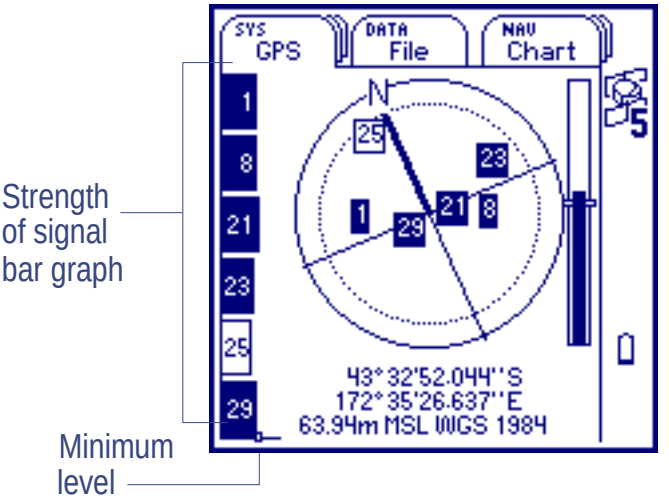


NOTE When the geometry of the satellites is poor, the satellite icon in the **Status bar** flashes. This icon is always visible, even when the GPS tab is not active.

For more information see **Satellite geometry**.

Signal strength

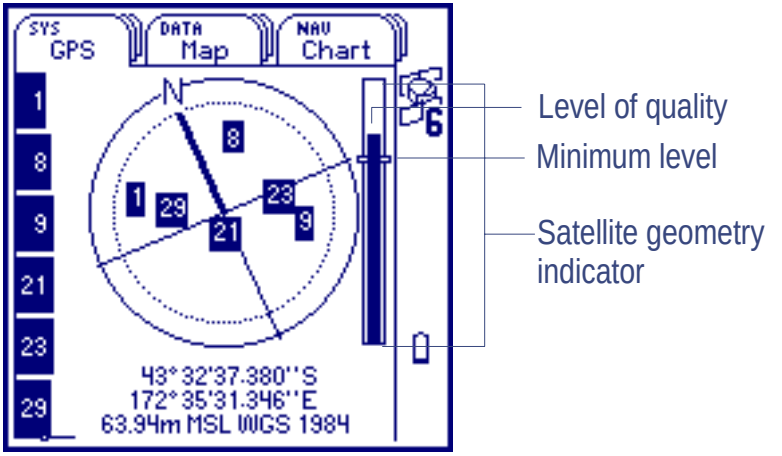
The signal strength bar graph is a graphical representation of the signal quality of each satellite that the GeoExplorer 3 is currently tracking. The signal strength of a satellite must be sufficient before it can be used by a GPS receiver. A black bar represents a satellite with a signal strength above the configured minimum level. An empty bar represents a satellite that is not being used to compute GPS positions. (The signal strength is below the configured minimum level.)



To change the minimum level, use the **GPS** slider bar.

Satellite geometry

The satellite geometry indicator is a graphical representation of the overall quality of the GPS positions computed.



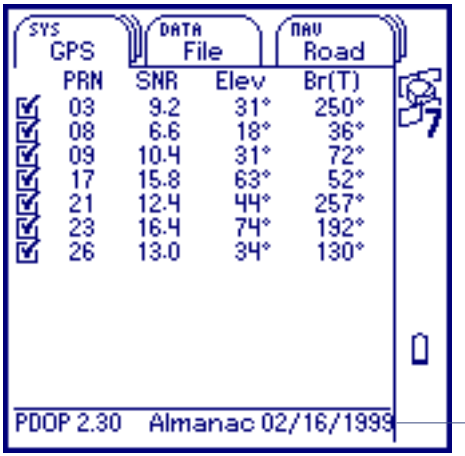
The quality of the computed positions is a function of the geometry of the visible satellites (how they are positioned in the sky relative to each other). When the satellites are well spaced, and cover a large portion of the sky, the GeoExplorer 3 data collection system is able to compute accurate positions. The level on the indicator is high. If satellites are grouped together in the sky, the accuracy of the computed positions is reduced. The level on the indicator is low.

When the level of quality falls below the minimum level, the GeoExplorer 3 stops computing GPS positions. The minimum level accepted is a configurable value. To change it, use the **GPS** slider bar.

Advanced mode

SYS / GPS / OPTION / **Advanced mode**

To display the GPS tab in Advanced mode, press OPTION and select Advanced mode.



Use this screen to view information about satellites as text. The message bar at the bottom of the screen displays Almanac information and the current PDOP.

To return to the Standard mode press OPTION and select Standard mode.

Advanced mode of the GPS tab displays the following information:

- **PRN**
- **SNR**
- **Elev**
- **Br(T) or Br(M)**
- **PDOP**
- **Almanac**

NOTE Use the **GPS** slider bar to configure the elevation, SNR, and PDOP mask.

This column...	Lists...
PRN	The **pseudorandom number** of each satellite. This number is used to uniquely identify each satellite. If the satellite is currently being used by the GeoExplorer 3 to compute positions, a ✓ appears to the left of the PRN.
SNR	The current signal-to-noise ratio of each satellite. The signal strength of a satellite is a measure of the information content of the signal, relative to the signal's noise. The typical SNR of a satellite at 30° elevation is between 10.0 and 15.0. The quality of a GPS position is degraded if the SNR of one or more satellites in the constellation falls below 6.0. The GeoExplorer 3 data collection system lets you set the **SNR mask**. This value is used to determine whether the signal strength of a satellite is sufficient for that satellite to be used by the GPS receiver. If a satellite's SNR is below the configured SNR mask, that satellite is not used to compute positions. **NOTE** If a satellite is marked as 'unhealthy' by the GPS Control Segment, the characters 'U/H' appear in the SNR column for that satellite.

This column...	Lists...
Elev	The current elevation above the horizon of each satellite. A satellite that is below the configured **Elevation mask** is not used to compute positions.
Br(T) or Br(M)	The current **bearing** to each satellite. This bearing is shown relative to either **true north** (T) or **magnetic north** (M), as determined by the currently configured **North reference**.

PDOP

The accuracy of a position computed by a GPS receiver is a function of the geometry of the GPS constellation visible at that moment in time. When the visible satellites are well separated in the sky, the GPS receiver can compute accurate positions. If two or more satellites are close together at the time the position is recorded, the small errors inherent in measuring their signals compound, reducing the accuracy of computed positions.

There are several Dilution of Precision (DOP) factors associated with GPS. These factors give an indication of the expected accuracy of the Global Positioning System (GPS). DOP factors are linear multipliers on the expected error, so a small DOP value is best. The best overall indicator of satellite constellation geometry is Position Dilution of Precision, or PDOP.

The PDOP value is a measure of positional accuracy. This table shows how PDOP values are categorized.

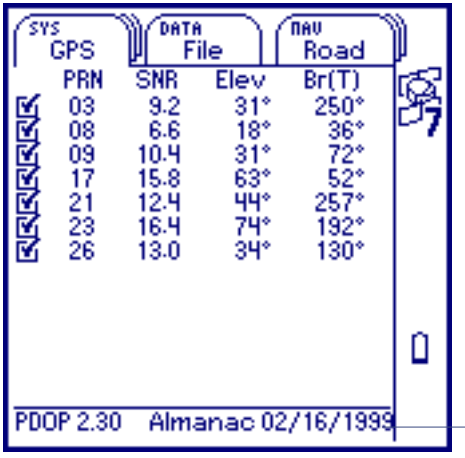
PDOP level	Quality
1 to 4	Excellent
4 to 6	Good
6 to 8	Fair
8 to 12	Poor
12 to 100	Very poor
100 and above	Unusable

The GeoExplorer 3 lets you specify a **PDOP mask**. It uses this mask as an upper bound on PDOP values. You can configure the desired level of positional accuracy, and makes sure that the positions logged are of a certain quality. When the PDOP climbs above this mask, the GeoExplorer 3 stops computing GPS positions. This is indicated by the satellite icon in the **Status bar**.

Almanac

An almanac is a set of data that is used to predict satellite orbits over a moderately long period of time, usually about a month. The almanac contains clock information and information about the orbital path for each satellite (where it is in the sky at a particular time).

The GeoExplorer 3 takes approximately 15 minutes to collect a new almanac. It can also collect an almanac and compute positions at the same time.



The bottom of the Advanced mode screen displays the date of the current almanac.

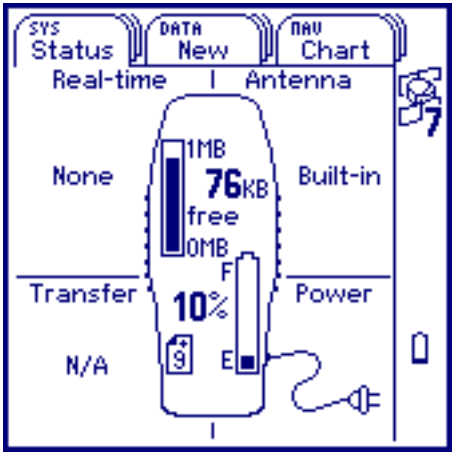
An almanac is required by Trimble's Quick Plan software.

For more information refer to the Pathfinder Office online Help.

The Status tab

SYS / Status

To display the Status tab, press SYS until the Status tab is active. It appears in Standard mode.



Use this screen to view information about the GeoExplorer 3 hardware, accessories, and external connections.

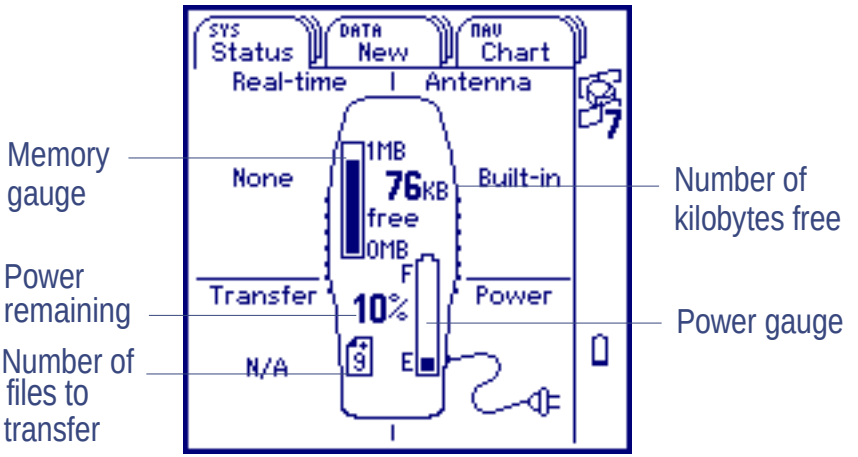
You can also display the Status tab in **DGPS mode**.

In Standard mode, the Status tab displays:

- **Hardware**
- **Accessories and external connections**

Hardware

Information about the status of the GeoExplorer 3 hardware is shown on the inside of the GeoExplorer 3 diagram.



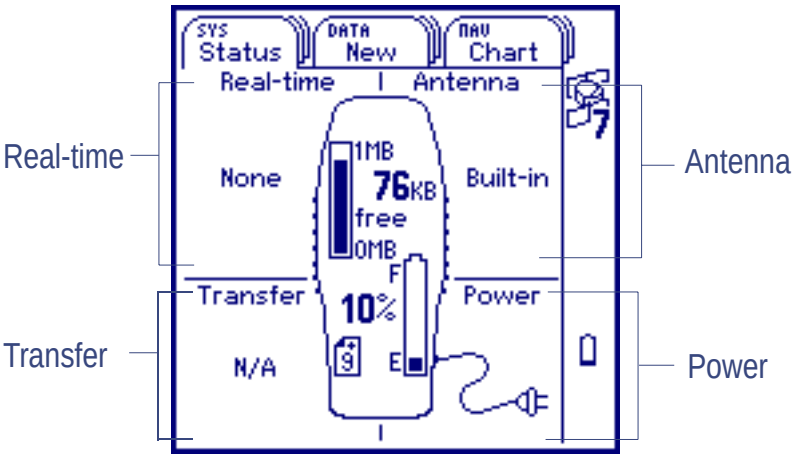
This screen displays the following hardware information:

- **Memory gauge**
- **Power level**
- **Number of files to transfer**

Display	Description
Memory gauge	The memory gauge is shown in the top portion of the GeoExplorer 3 diagram. It shows the level of memory available. The lower the level on the gauge, the more memory there is available. The higher the level on the gauge, the less memory there is available. The number of kilobytes (KB) free is also displayed.
Power level	The amount of internal power remaining is indicated by the power gauge and a percentage. The power gauge is displayed on the bottom right of the GeoExplorer 3 diagram. The higher the level on the gauge, the more internal power remains. The lower the level, the less internal power remains. The percentage of remaining power is indicated on the left of the power gauge.
Number of files to transfer	The number of files not yet transferred to an office computer is indicated in the bottom left of the GeoExplorer 3 diagram. This number indicates the number of data files, base and rover, that have not been transferred from the GeoExplorer 3 data collection system to an office computer.

Accessories and external connections

Information about accessories and the status of external connections is shown in the four panels surrounding the GeoExplorer 3 diagram.



This screen displays the following information:

- **Real-time**
- **Antenna**
- **Transfer**
- **Power**

This panel ...	Shows ...
Real-time	The current real-time status. Depending on how the GeoExplorer 3 data collection system is configured, one of three icons is displayed:  **Beacon** – Indicates that the GeoExplorer 3 data collection system is using the Beacon-on-a-Belt (BoB) receiver. The current status is indicated at the top of the panel. The possible states are Locked, Tracking, Searching, or Idle. The current frequency being tracked/locked onto is displayed below the beacon icon. The histogram on the left of the icon indicates the SNR (signal-to-noise ratio) of the differential GPS beacon signal being received. If the differential GPS beacon is not locked onto a frequency, then the frequency that it is currently trying to track is displayed, and the SNR histogram is empty.  **Other** – Indicates that the GeoExplorer 3 is using an external radio for real-time corrections. **None** **None** – Indicates that the GeoExplorer 3 is not configured to receive real-time corrections.

This panel ...	Shows ...
Antenna	The type of antenna in use.  **Connected** – Indicates that the GeoExplorer 3 data collection system is connected to an external antenna. **Built-in** **Built-in** – Indicates that the GeoExplorer 3 is using the internal antenna.

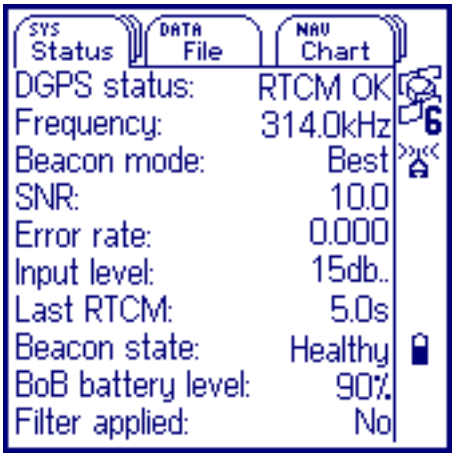
This panel ...	Shows ...
Transfer	The data transfer status. There are three possible states: **IDLE** – Indicates that the GeoExplorer 3 is not sending or receiving data.  **Connected and transferring** – Indicates that the GeoExplorer 3 is connected to an office computer. Movement along the cable indicates that data is being transferred. A message **`Complete`** appears above the transfer icon when data transfer is done, **`Failed`** indicates that the data transfer was unsuccessful. The number of bytes successfully transferred is indicated on the bottom of this icon.  **NMEA** – Indicates that the GeoExplorer 3 is outputting **NMEA** messages.

This panel ...	Shows ...
Power	The type of power source. Depending on the type of power source, one of three icons is displayed: **Internal** – **Internal** – Indicates that the GeoExplorer 3 is using the internal power source.  – **External** – Indicates that it is using an external power source.  – **Charging**– Indicates that it is connected to an external power source and is charging.

DGPS mode

SYS / Status / OPTION / DGPS mode

To display the Status tab in the DGPS mode, press OPTION and select DGPS mode:



Use this screen to view real-time information status of the GeoExplorer 3, in a text based format.

In DGPS mode, the Status tab displays information about:

- **DGPS status**
- **Frequency**
- **Beacon mode**
- **SNR**
- **Error rate**
- **Input level**
- **Last RTCM**
- **Beacon state**
- **BoB receiver battery level**
- **Filter applied**

Field	Description
DGPS status	Whether the GeoExplorer 3 is receiving real-time corrections. There are three states: • **Locked / Tracking / Searching / Idle** – When the GeoExplorer 3 uses the BoB receiver for real-time corrections, one of these values appears in the DGPS status. Each value describes the status of the real-time corrections currently being received. • **On** –The GeoExplorer 3 is using a radio source rather than the BoB receiver for real-time corrections. • **Off** – The GeoExplorer 3 is not receiving real-time corrections. **NOTE** When the DGPS status is On or Off, the other fields show N/A.
Frequency	The current frequency of the satellite that is being tracked/locked onto. The available frequencies are between 283.5 kHz and 325 kHz.

Field	Description
Beacon mode	Best – when the BoB receiver is in Best mode it will trace the best frequency that it can, and will change frequencies if its current frequency becomes unsatisfactory. Fixed – when the BoB receiver is in Fixed mode it will track one frequency and will not alter from this frequency unless you alter the frequency manually on the BoB receiver.
SNR	The signal-to-noise ratio, measured in decibels (dB), of the differential GPS beacon frequency. An SNR of above 6.0 indicates that the signal is usable.
Error rate	The RTCM Word Error Rate. This is the number of RTCM words with parity errors, expressed as a decimal fraction. An error rate of below 0.1 is acceptable.
Input level	The intensity level of the electro-magnetic field, measured in decibels above one microvolt per meter (dMµ V/M). An input level between 10 dBµ V/M and 100 dBµ V/M is acceptable.
Last RTCM	The Last RTCM field indicates the time (in seconds) since the last RTCM message was received by the GeoExplorer 3. The Last RTCM value should be less than 30 seconds. Newer correction values yield greater precisions than older values.

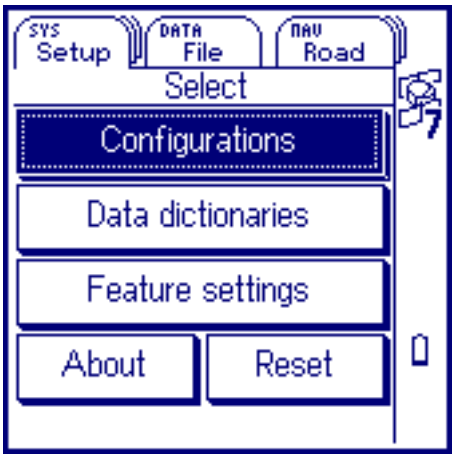
Field	Description
Beacon state	The health of the signal received from the BoB receiver. Possible settings are **Healthy**, **Unhealthy**, and **Unmonitored**. The GeoExplorer 3 will not use unhealthy differential GPS beacon corrections to correct GPS positions in real-time.
BoB receiver battery level	The BoB receiver battery level field displays the remaining battery power of the BoB receiver, expressed as a percentage.
Filter applied	The Filter applied field indicates whether a filter has been applied to the frequency list on the BoB receiver.

NOTE Depending on how the GeoExplorer 3 is configured, these fields can appear as N/A.

The Setup tab

SYS / Setup

To display the Setup tab, press SYS until the Setup tab is active. The Select screen appears:



Use the Setup tab to create and edit data dictionaries, edit feature settings, and to edit the configuration. You can also reset the GeoExplorer 3 data collection system to the factory defaults and find out about the unit.

To select a button, highlight it and press ENTER.

Press OPTION to display the **Re-lock option**.

The buttons are:

- **Configurations**
- **Data dictionaries**
- **Feature settings**
- **About**
- **Reset**

Configurations

SYS / **Setup / Configurations**

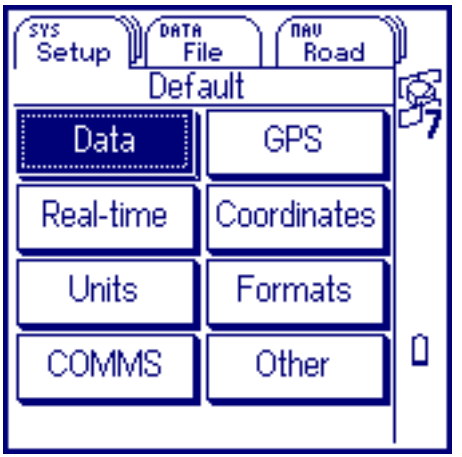
Select the Configurations button to edit the configuration. This sets the parameters that determine how data is collected, entered, displayed, and communicated to external devices.

Select Configurations from the Setup tab. The **Edit configuration** screen appears.

Edit configuration

SYS / Setup / Configurations

The Edit configuration screen displays configuration buttons:



Use this screen to select a configuration form to view or edit. You can configure some critical configurations before collecting data. For example, GPS is a critical configuration. You can also set non-critical configurations to suit your application or preferences.

Press CLOSE to close the Edit configuration screen.

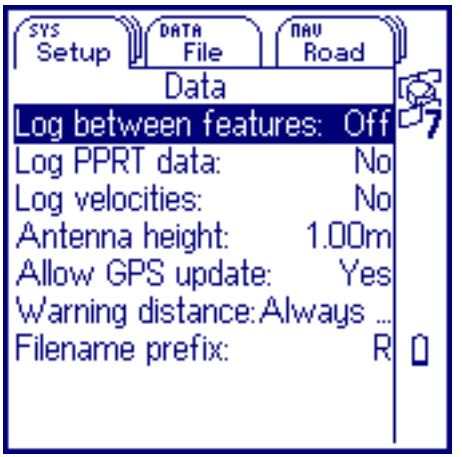
When you select a configuration button, the corresponding configuration form appears:

- **Data**
- **GPS**
- **Real-time**
- **Coordinates**
- **Units**
- **Formats**
- **COMMS**
- **Other**

Data

SYS / Setup / Configurations / Data

Select the Data button from the Edit configuration screen. The Data form appears:



Use the Data form to configure how the data is collected.

When you select a field, the GeoExplorer 3 pops up a list of entries for that field, or prompts you to enter data.

Press CLOSE to close the Data form.

These fields are available in the Data form:

- **Log between features**
- **Log PPRT data**
- **Log velocities**
- **Antenna height**
- **Allow GPS update**
- **Warning distance**
- **Filename prefix**

Use this field ...	To ...	Default value
Log between features	Specify the interval between feature GPS positions when you are between features. This provides a trail that shows where you travelled during a data collection session. (Log between features is a **Numeric entry** field. Set the logging interval in time or distance units.) **NOTE** By default, the GeoExplorer 3 data collection system does not log positions unless a feature is selected. To log GPS positions when a feature is not selected refer to **Advanced datalogging options**. Positions between features may be referred to as 'Not in feature' positions in the Pathfinder Office software and other Trimble datalogging software.	Off

Use this field ...	To ...	Default value
Log PPRT data	Log the extra data needed to postprocess real-time data when you return to the office. To postprocess real-time data using differential corrections from a source other than that used in the field, you need to log extra information. This postprocessing real-time (PPRT) information is used to prepare the real-time data for postprocessing. Then, using the differential corrections, the data is postprocessed in the office. The PPRT data can provide even greater accuracy. The items in the **Pop-up list** are: • Yes • No	No
Log velocities	Select whether or not to log **velocity** data. The items in the pop-up list are: • Yes • No	No

Use this field ...	To ...	Default value
Antenna height	Enter the height of the antenna. The antenna height is the height of the GPS antenna above the feature you are collecting. Antenna height is a **Numeric entry** field.	1.00 m
Allow GPS update	Specify whether or not positional data can be updated (replaced). The items in the **Pop-up list** are: • Yes – When you are updating a feature you can log new GPS positions. This new data replaces the positional information stored for the feature. • No – When you are updating a feature you cannot update (replace) the position information stored for that feature. You can update attributes, but not the position(s).	Yes

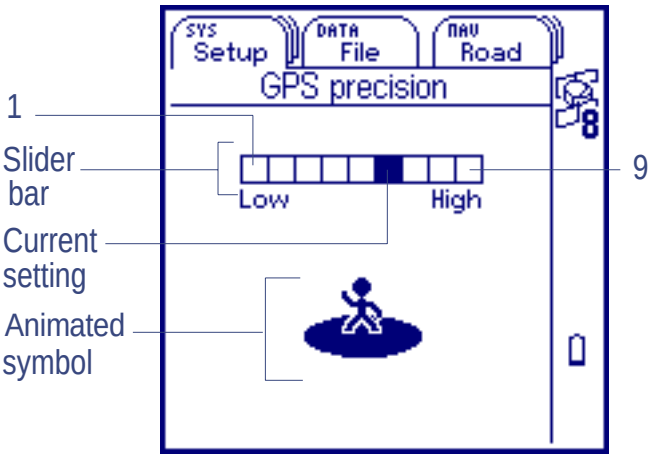
Use this field ...	To ...	Default value
Warning distance	Specify the warning distance between the original feature and your current position. When this distance is exceeded, a warning appears. For example, a warning distance of 5 m means that you are warned if you try to log GPS positions for a feature that is more than 5 m away from the previously collected position. This is a **Numeric entry** field. **NOTE** When you are not using real-time corrections, positions are accurate to within 100 m. A warning distance of less than 100 m is not suitable unless you are using real-time differential corrections in the field.	Always warn

Use this field ...	To ...	Default value
Filename prefix	Specify a single letter to identify the files you record. This is the first letter of the name of each automatically generated file. The rest of the file name is generated using the date and **UTC** time it was created. This is a **Text entry** field. **NOTE** This field does not affect base files. The filename prefix for base files is always “B”.	R

GPS

SYS / Setup / Configurations / GPS

Select the GPS button from the Edit configuration screen. The GPS slider bar appears:



Use the GPS slider bar to configure the precision (quality) required for GPS positions. You can also display the GPS slider bar in **Advanced mode**.

Press CLOSE to close the GPS slider bar.

The GPS slider bar has nine settings from High to Low. A highlighted cell represents the current setting.

To change the GPS slider bar setting, press ◁ or ▷. (The animation changes accordingly.) As you move the setting from High to Low, the GPS slider bar acts as a filter that accepts positions that are less precise.

When the GPS precision is set to a high value, the GeoExplorer 3 data collection system filters out, and will not use positions that do not meet the specified level of quality. Use a high setting when a project requires high precision.

More...

When the GPS precision is set to a low value, the specified level of quality is lower. The GeoExplorer 3 does not filter as many positions. Use a lower setting to collect more positions, including those that are slightly less precise.

If you are working on a project in a forest area, for example, the tree canopy can obstruct your view of the sky. Adjust the GPS slider bar to allow more positions to be recorded. Some positions may be of a lower quality but the increased number of positions makes sure that there are fewer gaps in the data collected. If the setting is too high, and the precision of the positions collected is high, positions may not be collected as often and you may not be able to map the entire area.

At the bottom of the screen is an animation that graphically represents the current GPS slider bar setting. As the setting moves from High to Low, the circle enlarges to indicate that the tolerance for accepting positions lessens.

NOTE This GPS setting is a critical parameter so it is important that you configure the slider bar to suit the environment.

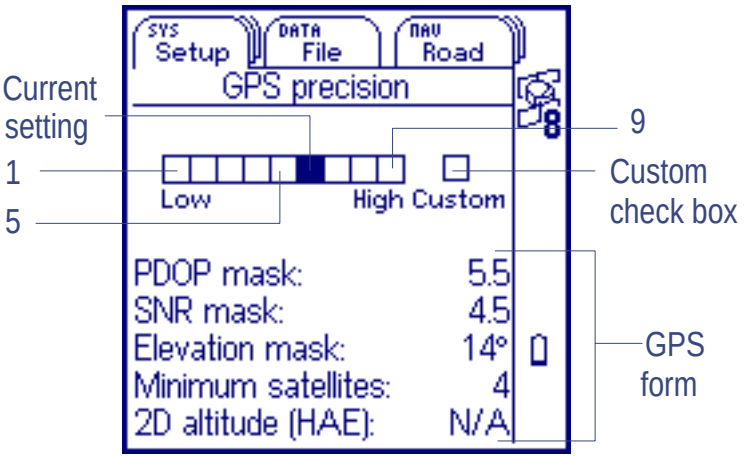
TIP If you are collecting data and the satellite icon in the **Status bar** flashes to warn that the satellite geometry is bad, try changing your position to improve the satellite geometry. Alternatively, stay where you are and wait for the satellite geometry to improve, or adjust the GPS slider bar.

NOTE A change to the GPS slider bar takes affect as soon as the setting is adjusted.

Advanced mode

SYS / Setup / Configurations / GPS / OPTION

To display the Advanced mode of the GPS slider bar, press OPTION and select Advanced mode.



Use the slider bar to configure the precision or quality required for GPS positions.

Select the Custom box to use the **Custom option**.

Press OPTION to change back to the Standard mode.

Advanced mode is similar to the Standard mode, but it displays the GPS fields instead of an animation. The following fields are shown:

- **PDOP mask**
- **SNR mask**
- **Elevation mask**
- **Minimum satellites**
- **2D altitude**

To change the slider bar setting press ◁ or ▷. As you change this setting, the GPS fields change accordingly. As you move from High to Low, the slider bar acts as a filter that accepts more or less precise positions.

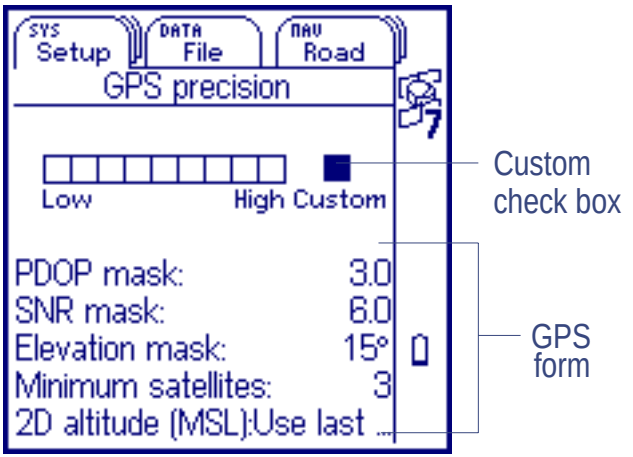
Each position on the slider bar has a specific PDOP, SNR, Elevation mask, Minimum satellites, and 2D altitude associated with it. This table shows these values:

Position on slider bar	PDOP mask	SNR mask	Elevation mask	Minimum satellites	2D altitude
1 (far left)	20	2	5	4	N/A
2	12	2.5	10	4	N/A
3	8	3	12	4	N/A
4	7	3.5	13	4	N/A
5	6	4	14	4	N/A
6	5.5	4.5	14	4	N/A
7	5	5	15	4	N/A
8	4.5	5.5	15	4	N/A
9 (far right)	4	6	15	4	N/A

NOTE The Standard and Advanced modes are related. If you change a setting in one, this is reflected in the other. The position on the slider bar is always the same in the two modes.

Custom option

To display the Custom option of the GPS slider bar, press ▷ until the Custom box is highlighted.



When the Custom box is selected, use the GPS form to configure the parameters that affect the precision of the GPS positions.

These fields are available in the GPS form:

- **PDOP mask**
- **SNR mask**
- **Elevation mask**
- **Minimum satellites**
- **2D altitude**

When the Custom check box is selected, press △ or ▽ to move between fields in the GPS form. To edit a field, select it, and press ENTER. The appropriate **Data entry** field appears.

Press CLOSE to close the Advanced/Custom GPS form.

NOTE The custom option is only available in Advanced mode. You cannot change the mode when the Custom box is selected.

NOTE When you adjust the PDOP mask, SNR mask, or elevation mask, the change is reflected on **The GPS tab**. The PDOP mask is represented by the minimum level mark on the position quality indicator. The SNR mask is represented by the minimum level mark on the signal strength bar graph. The elevation mask is represented by the inner circle on the skyplot.

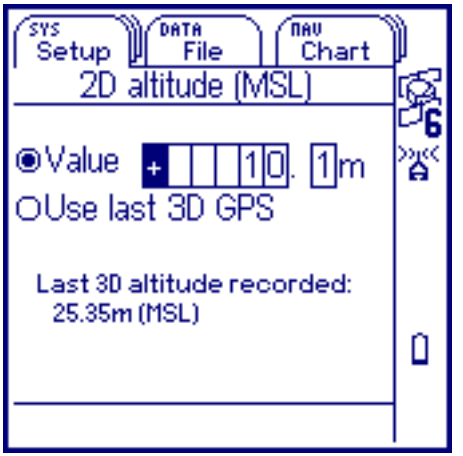
Use this field ...	To ...	Default value
PDOP mask	Specify a PDOP mask. The GeoExplorer 3 uses this value as an upper limit to the **PDOP** value. This lets you program a desired level of positional accuracy, and make sure that any positions logged are of a certain precision. When the PDOP goes above this mask, the GeoExplorer 3 stops computing GPS positions and the satellite icon appears in the **Status bar**. This is a **Numeric entry** field. **CAUTION** Increasing the PDOP mask lets you log more positions, but the quality of these positions may be seriously degraded. It is better to retain a lower PDOP mask and use Trimble's mission planning software to identify the brief times of high PDOP, than to continue collecting data and compromise the accuracy of the positions collected. Schedule other activities during these times. Conversely, you should not set the PDOP mask too far below the default. A low setting significantly decreases the number of GPS feature positions, without significantly increasing the precision.	4.0

Use this field ...	To ...	Default value
SNR mask	Specify the signal-to-noise ratio mask (or SNR mask). This value is used to determine whether the signal strength of each satellite is sufficient for that satellite to be used by the GPS receiver. If a satellite's SNR is beneath the configured SNR mask, it is not used to compute positions. This is a **Numeric entry** field. For more information about signal-to-noise ratio see **SNR**. **CAUTION** If you lower the SNR mask, the GeoExplorer 3 data collection system uses satellites with weaker signals. This may increase GPS coverage in environments where the GPS signal is weakened (such as in forests), but it may reduce GPS precision.	6.0

Use this field ...	To ...	Default value
Elevation mask	Specify the elevation mask. The GeoExplorer 3 can only use satellites above the specified elevation in the sky to compute GPS positions. This is a **Numeric entry** field. You rarely need to use an elevation mask lower than 15°, given the number of satellites in service. If you do lower the elevation mask, be aware that the increased **ionospheric noise** associated with satellites low on the horizon will counter any improvement in PDOP given by the lower elevation mask. The effects of ionospheric noise increase as lower satellites are used. **CAUTION** Make sure that the elevation mask for a rover is set higher than that for the base station, so that the base station always tracks the same satellites that are visible to each rover. As a rover gets further from the base, the difference between the elevation mask of the rover and the base becomes more critical due to the curvature of the earth. As a rule of thumb, the difference must be at least 1° for every 100 km between the base and the rover.	15°

Use this field ...	To ...	Default value
Minimum satellites	Specify the minimum number of satellites used to compute positions. The items in the **Pop-up list** are: • 3 – Use this configuration if satellite visibility is poor and you can determine your altitude above the WGS-84 ellipsoid very accurately at all times. The GeoExplorer 3 data collection system uses four satellites to compute GPS positions when it is able to, but when the number of visible satellites falls to three, it continues to compute positions. A position computed when there are only three usable satellites is called a two-dimensional position, and the accuracy of two dimensional positions is crucially affected by the accuracy of the altitude. You can configure the GeoExplorer 3 to use the altitude of the last available 3D position, or the altitude that you have entered in the **2D altitude** field. **CAUTION** If you set the minimum number of satellites to 3, and specify an inaccurate altitude, this has a significant impact on the position computed by the GeoExplorer 3 data collection system. As a rule of thumb, every meter of error in the altitude you supply is likely to cause at least three meters of error in the horizontal position computed by the GeoExplorer 3 data collection system.	4

Use this field ...	To ...	Default value
	• 4 – Use this configuration to achieve a high level of accuracy for logged positions. The GeoExplorer 3 data collection system uses as many satellites as it can (but at least four) to compute positions. This configuration usually yields the most accurate GPS positions and is the most flexible. If more than four satellites are available, the GeoExplorer 3 computes GPS positions with an overdetermined solution. • 5 – Use this configuration when doing **Carrier phase data collection**. The GeoExplorer 3 uses as many satellites as it can to compute positions. With this setting, GPS positions are logged only if there are at least five satellites available. This ensures that all logged positions have an overdetermined solution. This configuration yields the most accurate GPS positions. **CAUTION** The Minimum satellites field fundamentally affects the operation of the GPS receiver. Only modify it when you fully understand the consequences of any proposed changes.	

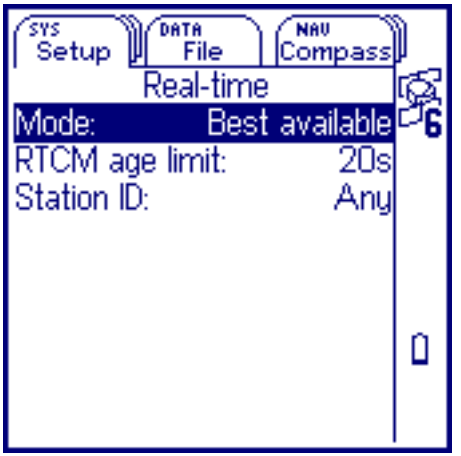
Use this field ...	To ...	Default value
2D altitude	Specify the altitude to be used for 2D positions. You can manually enter the altitude value using the **Numeric entry** field, or select the Use last 3D GPS option. The last 3D altitude recorded is shown at the bottom of the screen.  This field is only available when the minimum number of satellites is configured to 3. When the minimum number of satellites is set at 4 or 5, the 2D altitude is automatically set at N/A. **NOTE** It is important to specify the 2D altitude relative to the configured **Altitude reference**.	Use last 3D GPS

NOTE If the elevation mask is configured to 4° or below, the GeoExplorer 3 automatically uses 12 channels to receive GPS signals.

Real-time

SYS / Setup / Configurations / Real-time

Select the Real-time button from the Edit configuration screen. The Real-time form appears:



Use the this form to configure parameters for collecting data using **RTCM**.

Press CLOSE to close the Real-time form.

These fields are available in the Real-time form:

- **Mode**
- **RTCM age limit**
- **Station ID**

Use this field ...	To ...	Default value
Mode	Indicate which positions are displayed and recorded. The items in the **Pop-up list** are: • Best available – this uses RTCM corrected positions if available, otherwise uncorrected positions will be displayed and recorded. • RTCM only – only GPS positions that have been corrected in real time are displayed and recorded. The real-time icon appears in the **Status bar**.	Best available

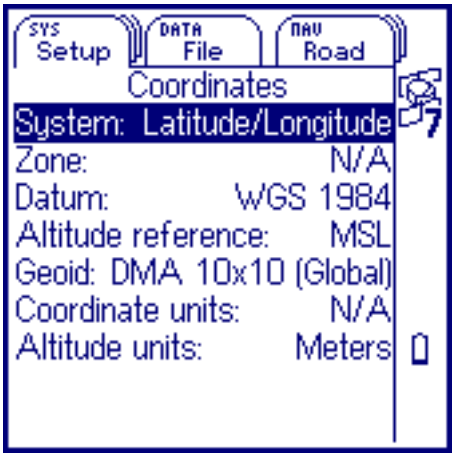
Use this field ...	To ...	Default value
RTCM age limit	Specify the RTCM age limit. This is the time for which the receiver continues to apply a projected correction (based on the most recent correction received) to each new GPS position that it computes. If no new real-time corrections are received in the specified time, the most recent correction is considered too old to provide accurate, corrected positions. When this occurs, the GPS receiver stops using the corrections, and you are warned that the real-time link is lost. Items in the **Pop-up list** are: • 5 s • 10 s • 20 s • 50 s • 100 s	20 s

Use this field ...	To ...	Default value
Station ID	Enter a specific RTCM base station ID. This must be a number between 0 and 1023. The ID number identifies the RTCM station and lets the GeoExplorer 3 data collection system locate and use a particular base station. By default, the receiver attempts to choose the “best” RTCM station (based typically on the distance to the base station). This is a **Numeric entry** field or you can select Any.	Any

Coordinates

SYS / Setup / Configurations / Coordinates

Select the Coordinates button from the Edit configuration screen. The Coordinates form appears:



Use the this form to configure parameters that affect how data is collected and displayed. Specify a datum transformation and a map projection to see the GPS position, and the position of the features that you collect displayed, in your local coordinate system. This makes it easy to check your position or navigate using a map produced by your GIS.

Press CLOSE to close the Coordinates form.

These fields are available in the Coordinates form:

- **System**
- **Zone**
- **Datum**
- **Altitude reference**
- **Geoid**
- **Coordinate units**
- **Altitude units**

Use this field ...	To ...	Default value
System	Specify the coordinate system to be used when entering and displaying coordinates. Select this field to display a list of coordinate systems currently loaded on the GeoExplorer 3 handheld. Items in the **Pop-up list** are: • Latitude/Longitude • Universal Transverse Mercator (UTM) **NOTE** To transfer other **Coordinate systems** to the GeoExplorer 3, use the Coordinate System Manager software. For more information, refer to the Pathfinder Office online Help. You cannot transfer coordinate systems from Pathfinder Office to the GeoExplorer 3c edition. **NOTE** To reset the list of available coordinate systems, press OPTION and select Reset. For more information see **Resetting coordinate systems**.	Latitude/ Longitude

Use this field ...	To ...	Default value
Zone	Specify the zone (if applicable) to be used when calculating coordinates. Select this field to display the zones that apply to the coordinate system selected in the previous field. If only one zone is available for the selected coordinate system, this field is read-only.	MSL
Datum	View (and in some cases specify) the **datum** to be used when calculating coordinates. Depending on the selected system and zone, this field may be read-only.	WGS 1984
Altitude reference	Specify the altitude reference to be used when entering and displaying altitude values. Items in the **Pop-up list** are: • **MSL** (Mean sea level) • **HAE** (Height above ellipsoid)	MSL

Use this field ...	To ...	Default value
Geoid	Specify the **geoid** model to be used for calculating the height above mean sea level. This field is only available when the selected altitude reference is MSL. The supplied geoid is the DMA 10x10 (Global) model. Use the Pathfinder Office software to upload other geoids to the GeoExplorer 3 handheld. To delete a geoid, select the Geoid field and highlight the geoid you want to delete. Press OPTION and select the Delete option. You are prompted to confirm the deletion. Configurations using this geoid default back to the DMA 10x10 geoid. **NOTE** You cannot delete the DMA 10x10 (Global) geoid or a geoid that is currently in use.	DMA 10x10 (Global)
Coordinate units	Specify the units to be used for entering and displaying coordinates when using a coordinate system other than Latitude/Longitude. Items in the **Pop-up list** are: • Meters (m) • Feet (ft) • Yards (yd) • US Survey Ft (sf) • Namibian Meters (NAm)	N/A

Use this field ...	To ...	Default value
Altitude units	Specify the units to be used for entering and displaying altitude units. Items in the **Pop-up list** are: • Meters (m) • Feet (ft)	Meters

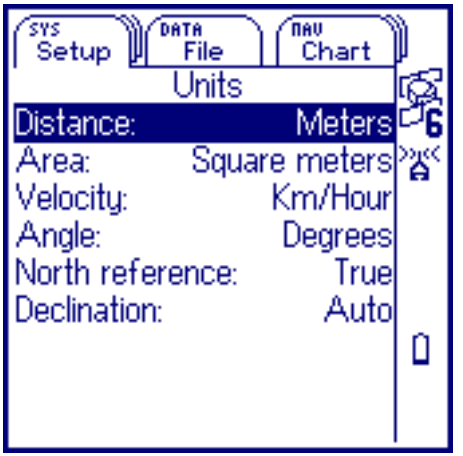
NOTE Some fields will display N/A, depending on how related fields are configured.

NOTE When you transfer a configuration file from Pathfinder Office and a coordinate system is specified, that coordinate system is displayed by default. If you do not transfer the appropriate files, system defaults are displayed.

Units

SYS / Setup / Configurations / Units

Select the Units button from the Edit configuration screen. The Units form appears:



Use this form to configure how units are to be entered and displayed.

Press CLOSE to close the Units form.

These fields are available in the Units form:

- **Distance**
- **Area**
- **Velocity**
- **Angle**
- **North reference**
- **Declination**

Use this field ...	To ...	Default value
Distance	Specify the units to be used when entering and displaying distances. Items in the **Pop-up list** are: • Meters (m) • Feet (ft) • Kilometers (km) • Miles (mi) • Nautical Miles (nm)	Meters
Area	Specify the units to be used when entering and displaying area. Items in the pop-up list are: • Square meters (m^2) • Square feet (ft^2) • Hectares (Ha) • Acres (A) • Square kilometers (km^2) • Square miles (mi^2)	Square meters

Use this field ...	To ...	Default value
Velocity	Specify the units to be used when entering and displaying **velocity**. Items in the **Pop-up list** are: • Meters/Second (m/s) • Feet/Second (ft/s) • Km/Hour (kph) • Miles/Hour (mph) • Knots (kt)	Km/Hour

Use this field ...	To ...	Default value
Angle	Specify the units to be used when entering and displaying bearing angles. Items in the **Pop-up list** are: • Degrees (°) • Gradians (gon) • Rhumbs (rh) • Mils (mil) **NOTE** Angle units only affect angles displayed when navigating and entering offsets. They do not affect: • the bearings shown in the Advanced Mode screen of the GPS tab. • the entry or display of latitudes and longitudes (which are always entered and displayed in degrees with optional minutes and/or seconds).	Degrees

Use this field ...	To ...	Default value
North reference	Specify whether bearings are displayed relative to **true north** or **magnetic north**. Items in the **Pop-up list** are: • True – useful when navigating relative to a background map. • Magnetic – useful when using a magnetic compass to navigate.	True
Declination	Specify the **magnetic declination** for your area. (This is printed on most accurate maps.) This is a numeric entry field or you can select Auto. Items in the pop-up list are: • Value – enter the declination. If you move a significant distance, it may be necessary to update the declination. • Auto – if you do not know the magnetic declination, or prefer not to update it as you move, the GeoExplorer 3 uses an internal database to determine the declination based on your current position.	Auto

Formats

SYS / Setup / Configurations / Formats

Select the Formats button from the Edit configuration screen. The Formats form appears:

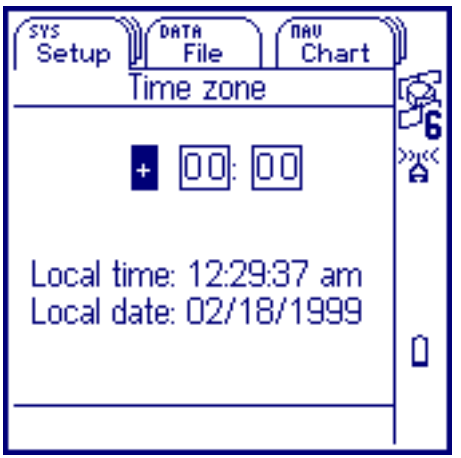
Use this form to configure the parameters that affect the formats used to enter and display data.

Press CLOSE to close the Formats form.

These fields are available in the Formats form:

- **Language**
- **Offset**
- **Degrees**
- **Date**
- **Time**
- **Time zone**
- **Coordinate order**

Use this field ...	To ...	Default value
Language	Specify the language that you want to work with. A number of languages are loaded on the GeoExplorer 3.	English
Offset	Specify the format to be used when entering offsets. Items in the pop-up list are: • Horz/Vert—horizontal and vertical distance • Slope/Incl—slope distance and inclination	Horz/Vert
Degrees	Specify the format to be used when entering angles that use degrees (including latitudes and longitudes). Items in the pop-up list are: • DD°MM'SS.ss" • DD°.ddd • DD°MM.mmm	DD°MM'SS.ss"
Date	Specify the format to be used when displaying the local date in the Time zone field. Items in the **Pop-up list** are: • DD/MM/YYYY • YYYY/MM/DD • MM/DD/YYYY	MM/DD/YYYY

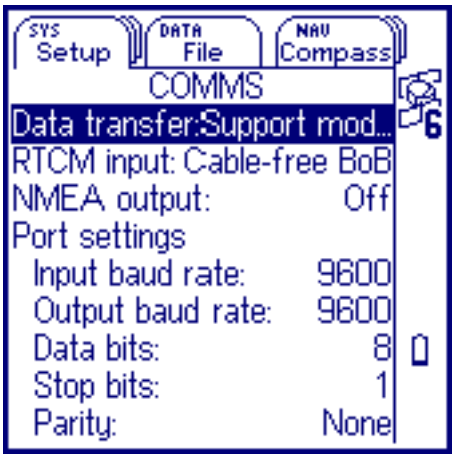
Use this field ...	To ...	Default value
Time	Specify the format to be used when displaying the local time in the Time zone field. Items in the **Pop-up list** are: • 12 hour • 24 hour	12 hour
Time zone	Specify the time zone to be used by the GeoExplorer 3 data collection system. This is a **Numeric entry** field.  Set the time zone by adjusting the value to display the correct local time and date.	00:00

Use this field ...	To ...	Default value
Coordinate order	Specify the order to be used when displaying a position's coordinates. Items in the **Pop-up list** are: • Lat/Long • Long/Lat • North/East • East/North	Lat/Long (North/East)

COMMS

SYS / Setup / Configurations / COMMS

Select the COMMS button from the Edit configuration screen. The COMMS form appears:



Use this form to set the parameters for communication with external devices. These affect data transfer to and from an office computer and communication with radios when receiving real-time corrections or NMEA Output Messages.

Press CLOSE to close the COMMS form.

These fields are available in the COMMS form:

- **Data transfer**
- **RTCM input**
- **NMEA output**

Port settings:

- **Input baud rate**
- **Output baud rate**
- **Data bits**
- **Stop bits**
- **Parity**

Use this field ...	To ...	Default value
Data transfer	Specify the device used to connect the GeoExplorer 3 to the office computer. Items in the **Pop-up list** are: • Support module – the GeoExplorer 3 must be placed in the support module for data transfer to the office computer to occur. • Serial clip – the serial clip must be attached to the rear of the GeoExplorer 3 and connected to the computer using a null modem cable for data transfer to occur. • Off – data transfer to the office computer is disabled. **NOTE** The Data transfer field cannot be set to the same value as configured in the **RTCM** input or **NMEA** output fields (except Off).	Support module

Use this field ...	To ...	Default value
RTCM input	Specify the connection device used to receive **RTCM** messages. Items in the **Pop-up list** are: • Cable-free BoB **NOTE** This option is not available with the GeoExplorer 3c edition. • Support module • Serial clip • Off **NOTE** The RTCM input field cannot be set to the same value as the Data transfer field (except Off).	Cable-free BoB or Serial clip (with GeoExplorer 3c edition)

Use this field ...	To ...	Default value
NMEA output	Specify the connection device used to output **NMEA** messages. Items in the **Pop-up list** are: • Support module • Serial clip • Off **NOTE** The NMEA output field cannot be set to the same value as the Data transfer field (except Off).	Off
Input baud rate	Specify the **baud** rate for input of RTCM data. Items in the pop-up list are: • 110 • 300 • 600 • 1200 • 2400 • 4800 • 9600 • 19200 • 38400	9600

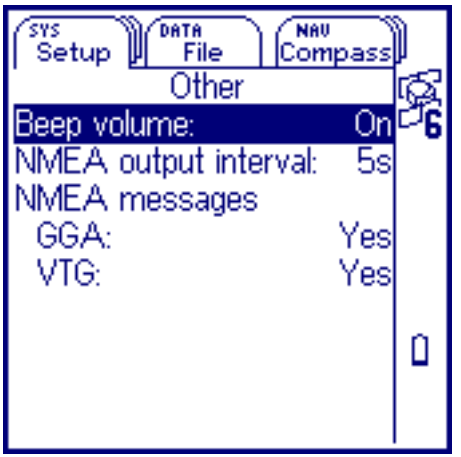
Use this field ...	To ...	Default value
Output baud rate	Specify the baud rate for output NMEA data. Items in the **Pop-up list** are: • 110 • 300 • 600 • 1200 • 2400 • 4800 • 9600 • 19200 • 38400	9600
Data bits	Specify the number of data bits used to transfer data. When data is transferred, each character is sent in a stream of single bits, but many devices transmit or receive fewer than eight bits when transferring a single character. This field is the same for data input and data output. Items in the pop-up list are: • 7 • 8	8

Use this field ...	To ...	Default value
Stop bits	Specify the number of stop bits used to indicate the end of a byte. Stop bits are part of the data that is transferred. When data is transferred, each character is sent in a stream of single bits. There are eight bits in a byte and a stop bit is used to indicate the end of a byte. This field is the same for data input and data output. Items in the **Pop-up list** are: • 1 • 2	1
Parity	Specify the **parity** used when binary digital data is transferred. For most data transfers, select the same parity as is set in the external communication device. This field is the same for data input and data output. Items in the pop-up list are: • None • Even • Odd	None

Other

SYS / Setup / Configurations / Other

Select the Other button from the Edit configuration screen. The Other form appears:



Use this form to set the parameters for the beep volume, and to configure the GeoExplorer 3 data collection system for NMEA Output Messages.

Press CLOSE to close the Other form.

These fields are available in the Other form:

- **Beep volume**
- **NMEA output interval**

NMEA messages:

- **GGA**
- **VTG**

Use this field ...	Use this field to ...	Default value
Beep volume	Specify whether the GeoExplorer 3 handheld emits a beep. Items in the **Pop-up list** are: • On – any warnings or position logging causes the GeoExplorer 3 to beep. • Off – the GeoExplorer 3 does not beep.	On
NMEA output interval	Specify the output interval at which **NMEA** messages are transmitted. This is a **Numeric entry** field.	5 s
GGA	Specify if the **GGA message** string is to be output in the NMEA message (see Messages). Items in the pop-up list are: • Yes • No	Yes

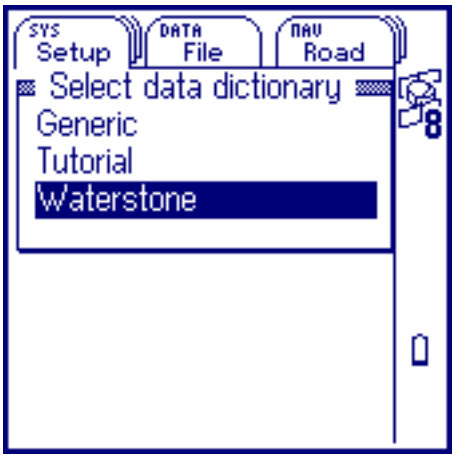
Use this field ...	Use this field to ...	Default value
VTG	Specify if the **VTG message** string is to be output in the NMEA message. Items in the **Pop-up list** are: • Yes • No	Yes

Data dictionaries

SYS / Setup / Data dictionaries

Use this list to edit an existing data dictionary or create a new one. You can create new data dictionaries that are specific to different jobs. Use the GeoExplorer 3 data collection system in the field, or the Pathfinder Office software in the office, to create or edit a data dictionary.

Select Data dictionaries from the Setup tab. The Select data dictionary list appears:



To edit an existing data dictionary, select it from the list. The **Edit data dictionary** form appears.

Press CLOSE to close the Select data dictionary list.

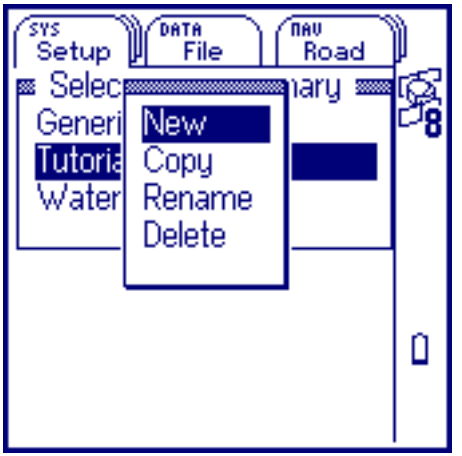
Press OPTION to display the advanced **Data dictionaries option list**.

NOTE Data dictionaries are listed in the order in which they were created. The most recent addition is at the bottom of the list.

Data dictionaries option list

SYS / Setup / Data dictionaries / OPTION

Press OPTION from the Select data dictionary list to view the available options.



The options are:

- **New**
- **Copy**
- **Rename**
- **Delete**

Use this option ...	To ...
New	Create a new data dictionary. When you select this option, the GeoExplorer 3 data collection system displays a **Text entry** field. Enter the name of the new data dictionary. Press CLOSE to save the name and go to the **Edit data dictionary** form.
Copy	Copy a data dictionary. Highlight the data dictionary to be copied. Press OPTION and select Copy. The GeoExplorer 3 displays a text entry field. Accept the default name or change it. The default name is Copy of <Data dictionary>. Press CLOSE to save the name and go to the Edit data dictionary form.
Rename	Change the name of an existing data dictionary. Highlight the data dictionary to be renamed. Press OPTION and select Rename. A text entry field appears. Change the name of the data dictionary. Press CLOSE to save the new name. **NOTE** The Rename and Delete options do not appear if Generic is highlighted in the list. You cannot rename or delete the generic data dictionary.

Use this option ...	To ...
Delete	Delete a data dictionary. Highlight the data dictionary to be deleted. Press OPTION and select Delete. You are prompted to confirm deletion. **NOTE** You cannot delete a data dictionary that is in use, or has been used by a file that is currently stored on the GeoExplorer 3.

NOTE If the dictionary name that you enter already exists, a warning message appears. You cannot create multiple data dictionaries with the same name.

Edit data dictionary

SYS / Setup / Data dictionaries / <Data dictionary name>

Select a data dictionary from the list of available dictionaries on the GeoExplorer 3. The Edit data dictionary form displays the comment, features, attributes, and values contained in the selected data dictionary.

Use this form to view information about adding, or editing the features, attributes, and values in the selected data dictionary.

Press CLOSE to close the Edit data dictionary form and save any changes. Press Fn CLOSE to close the Edit data dictionary form and abandon any changes.

Press OPTION to view the **Edit data dictionary option list**.

To edit the Comment field, select it. A **Text entry** field appears. Enter your comment. The Comment field is for reference only and it is optional.

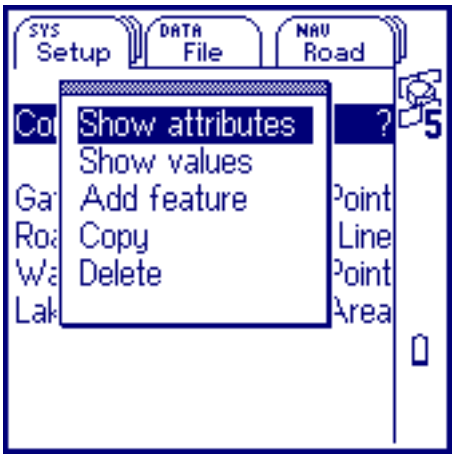
To edit a feature, attribute, or value select it from the list. The appropriate attribute entry form or **Pop-up list** appears. Enter the changes.

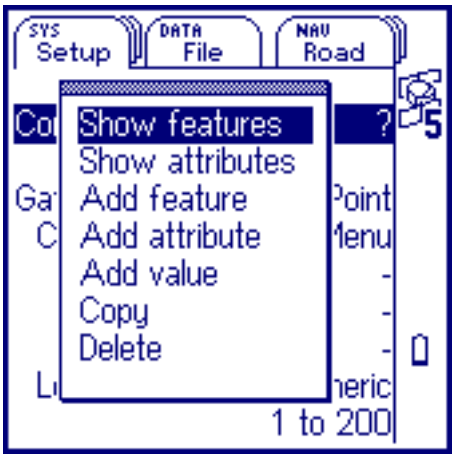
NOTE If a data file is open, there are restrictions as to what you can edit in the associated data dictionary. You can add to the end of the associated dictionary, but not delete or change any features, attributes, or values. For more information see **Dictionary**.

Edit data dictionary option list

SYS / Setup / Data dictionaries / <Data dictionary name> / OPTION

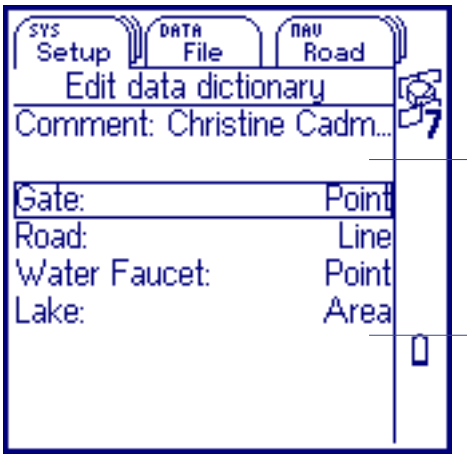
From the Edit data dictionary form, press OPTION to view the available options. The options that appear depend on what is currently displayed in the Edit data dictionary form.

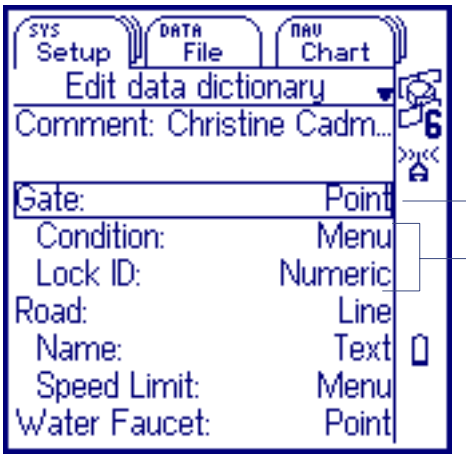


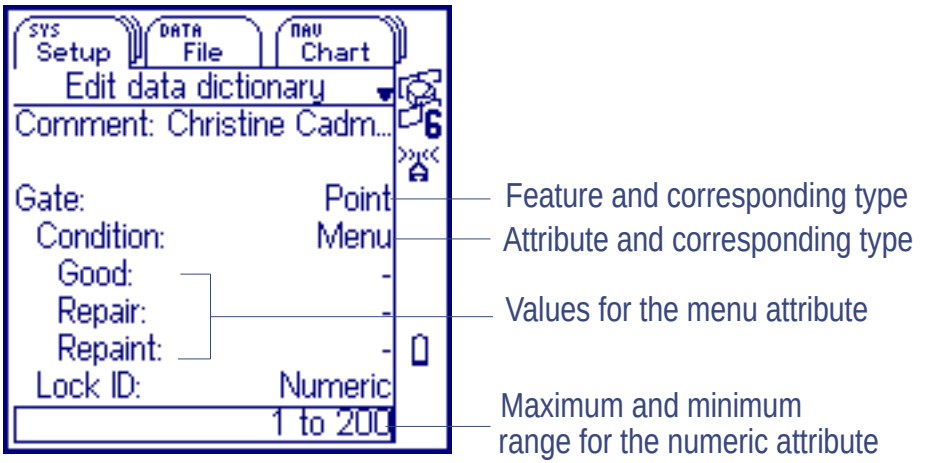


The options are:

- **Show features**
- **Show attributes**
- **Show values**
- **Add feature**
- **Add attribute**
- **Add value**
- **Copy**
- **Delete**

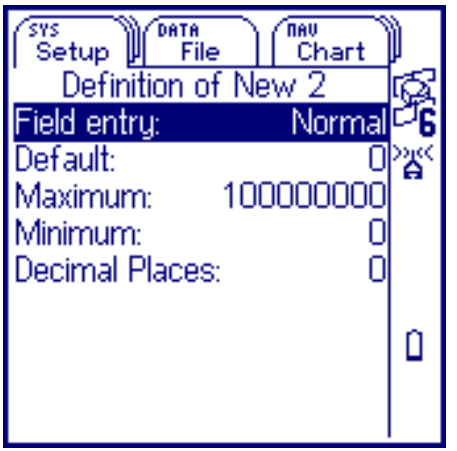
Use this option ...	To ...
Show features	Display the features and feature types that occur in the selected data dictionary. This option is only available if attributes or values are currently displayed. Select this option to hide attributes and values, and display only features and feature types.  **NOTE** When you open a data dictionary, Show features is the default option.

Use this option ...	To ...
Show attributes	Display the features, feature types, attributes, and attribute types associated with each feature. Attributes are indented to show which feature they belong to. 

Use this option ...	To ...
Show values	Display the values associated with each attribute. Values are indented to show which attribute they belong to. 
Add feature	Add a feature to the current data dictionary. When you select this option a feature is added below the selected feature. When a new feature is created, the prefix for the name is New and the suffix is a digit number (starting at 1 for the first one created), for example, New1, then New2, and so on. To edit the name, select it. A **Text entry** field appears. By default, the new feature is a point. To edit the feature type, select it. A **Pop-up list** appears.

Use this option ...	To ...
Add attribute	Add an attribute to the current data dictionary. This option is only available when attributes are displayed. When you select this option, an attribute is added below the selected attribute. When a new attract is created, the prefix for the name is New and the suffix is a digit number (starting at 1 for the first one created), for example, New1, then New2, and so on. To edit the name, select it. A **Text entry** field appears. By default, the new attribute is a text entry attribute. To edit the attribute type, select it. A **Pop-up list** appears. The attribute types are: • **Menu** – use the Add value option to create a list of values. To set a menu value as the default, highlight it and press ENTER. Only one value can be set as the default.

Use this option ...	To ...
Add attribute (continued)	• **Numeric** – use the Definition form to define the numeric attribute. Select the value field. The Definition form appears:



Use this form to specify the type of field entry, the maximum and minimum default values, and number of decimal places for the numeric attribute.

Use this option ...	To ...
Add attribute (continued)	• **Text** – use the Definition form to define the text attribute. Select the <-no.-> value. The Definition form appears. Specify the type of field entry, and the maximum number of characters allowed. • **Date** – use the Definition form to define the Date attribute. Select the DD/MM/YYYY (Manual) value. The Definition form appears. Specify the type of field entry, the auto generate options, and the format. • **Time** – use the Definition form to define the Time attribute. Select the 12 hour (Manual) value. The Definition form appears. Specify the type of field entry, the 24 hour option, and the auto generate options. • **Separator** – use this attribute type to annotate or create a break in the list of attributes. A separator is not an attribute, and you cannot enter a value for it.
Add value	Add a value to an attribute. This option is only available when values are displayed. When you select this option, a value is added below the selected value. When a new value is created, the prefix for the name is New and the suffix is a digit number (starting at 1 for the first one created), e.g. New1, then New2, and so on. To edit the value, select it. The appropriate field appears.

Use this option ...	To ...
Copy	Copy a feature, attribute, or value. Highlight the feature, attribute, or value that you want to copy. Press OPTION and select Copy. The new feature, attribute, or value appears at the bottom of the appropriate list. The default name is Copy of <feature / attribute / value>.
Delete	Delete a feature, attribute, or value. Highlight the feature, attribute, or value to delete. Press OPTION and select Delete. You are prompted to confirm the deletion. **NOTE** You cannot delete from a data dictionary any features, attributes, or values that are used by data files on the GeoExplorer 3.

Feature settings

SYS / Setup / Feature settings

Use the Select feature settings list to edit an existing feature setting or to create a new one. Use it to set logging intervals and minimum positions. These are critical parameters, so configure them to suit your application. You can also use the Select feature settings list to configure carrier phase data collection and offsets.

Select Feature settings from the Setup tab. The Select feature settings list appears:

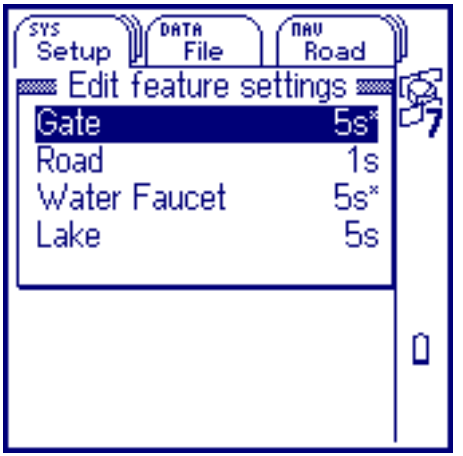
This list reflects the data dictionaries currently stored in the GeoExplorer 3. To edit the feature settings for a data dictionary, select it from the list. The **Edit feature settings** form appears.

Press CLOSE to close the Select feature settings list.

Edit feature settings

SYS / Setup / Feature settings / <Feature settings name>

The Edit feature settings list displays the feature name and the logging interval for every feature in the current data dictionary.



Use this list to view information about the settings for the features in the current data dictionary.

Press CLOSE to close the Edit feature settings list.

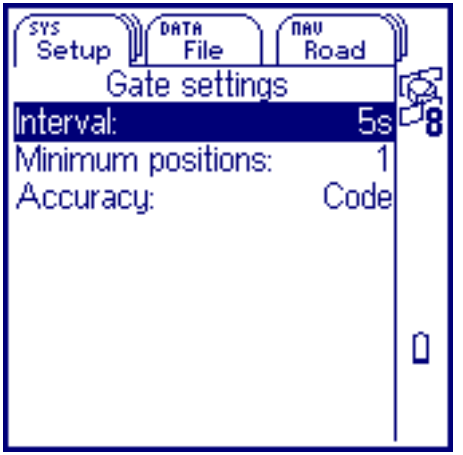
Press OPTION to view the **Edit feature settings option list**.

To edit the setting for a feature, select the feature from the list. The form that appears depends on what type of feature you select—point, line, or area.

- **Editing point features**
- **Editing line and area features**

Editing point features

When you select a point feature from the Edit feature settings list, the <Feature name> settings form appears. The name of the selected point feature is at the top of the screen.



Use this form to set or change the parameters for the selected point feature. The parameters affect the GPS positions collected for that feature.

Press CLOSE to close the <Feature name> settings form.

These fields are available in the Gate settings form:

- **Interval**
- **Minimum positions**
- **Accuracy**

Use this field ...	To ...	Default value
Interval	Specify the interval between feature GPS positions when you are collecting a point feature. For example, if you set the interval to five seconds, the GeoExplorer 3 logs GPS positions once every five seconds, from when you start the feature until you end it. This is a **Numeric entry** field or you can select Off.	5 s
Minimum positions	Specify the minimum number of positions that must be logged to achieve the required precision. (More positions means higher precision.) If you try to save a point feature before enough positions are logged, the GeoExplorer 3 warns you. You can store the feature anyway despite a possible loss of precision, or you can stay at the feature until enough positions are logged. This is a numeric entry field.	1

Use this field ...	To ...	Default value
Accuracy	Specify whether you want to collect code or carrier phase data for point features. Items in the **Pop-up list** are: • Code • Carrier For more information see **Carrier phase data collection**.	Code

Editing line and area features

When you select a line or area feature from the Edit feature settings list, the <Feature name> settings form appears. The name of the selected feature is at the top of the screen.

Use this form to set the line or area feature parameters for the selected feature. These parameters affect the GPS positions collected for that feature. You can also use this form to configure **Offsets**.

Press CLOSE to close the <Feature name> settings form.

These fields are available in the Lake settings form:

- **Interval**
- **Accuracy**

Offset:

- **Direction**
- **Slope distance**
- **Inclination**

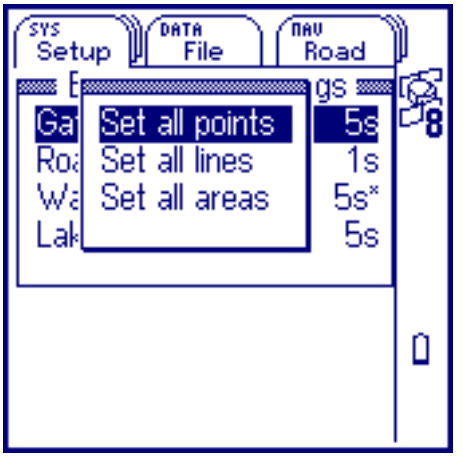
Use this field ...	To ...	Default value
Interval	Specify the interval (time or distance) between feature GPS positions when you are collecting a line or area feature. For example, if you set the interval to five seconds, the GeoExplorer 3 logs GPS positions once every five seconds, from when you start the feature until you end it. This is a **Numeric entry** field or you can select Off.	5 s
Accuracy	Specify whether you want to collect code or carrier phase data for line and area features. Items in the **Pop-up list** are: • Code • Carrier For more information see **Carrier phase data collection**.	Carrier

Use this field ...	To ...	Default value
Direction	Specify the direction to the line or area feature. The direction is relative to the direction of travel at the time the feature is recorded. Items in the **Pop-up list** are: • Right • Left	Right
Slope distance	Specify the slope distance (range) to the line or area feature. The range is the actual distance to the feature. This is a **Numeric entry** field.	0.00 m
Inclination	Specify the inclination to the line or area feature. The inclination is the angle above or below the horizon. This is a numeric entry field.	0°

Edit feature settings option list

SYS / Setup / Feature settings / <Feature settings name> / OPTION

Press OPTION from the Edit feature settings list to view the available options. Use these options to make the same change to all features of a particular type.



The options are:

- **Set all points**
- **Set all lines**
- **Set all areas**

Use this option ...	To set the parameters for all ...
Set all points	Point features in a data dictionary. When you select this, the Set all points form appears. Use it to change the settings for all point features. Press CLOSE to accept any changes and close the form. Press Fn CLOSE to close the form and abandon any changes.
Set all lines	Line features in a data dictionary. When you select this, the Set all lines form appears. Use it to change the settings for all line features. Press CLOSE to accept any changes and close the form. Press Fn CLOSE to close the form and abandon any changes.
Set all areas	Area features in a data dictionary. When you select this, the Set all areas form appears. Use it to change the settings for all area features. Press CLOSE to accept any changes and close the form. Press Fn CLOSE to close the form and abandon any changes.

About

SYS / Setup / About

Select the About button from the Setup tab. The About screen appears:

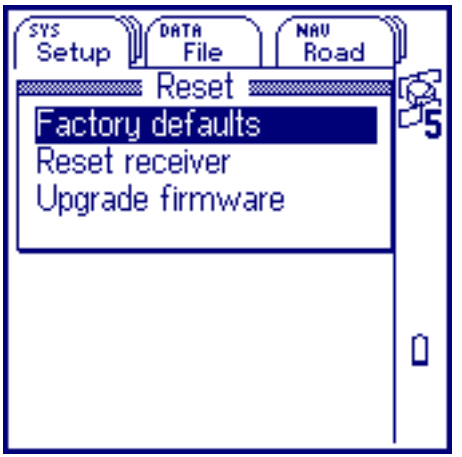
Use this screen to view information about the firmware. It displays the following information:

- Product name
- Trimble company name and logo
- Version number
- Serial number

Reset

SYS / Setup / Reset

Use the Reset list to reset the GeoExplorer 3 to factory defaults, reset the internal GPS receiver, or to prepare the GeoExplorer 3 to upgrade the firmware. Select Reset from the Setup tab. The reset list appears:



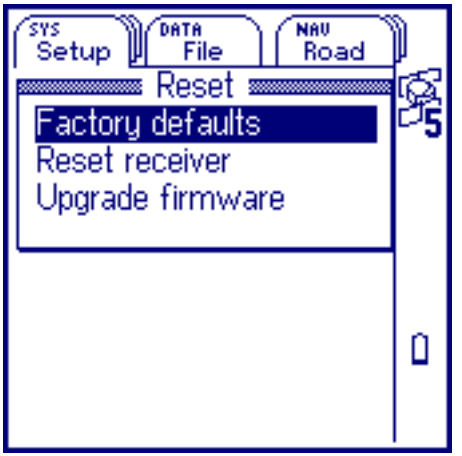
The options are:

- **Factory defaults**
- **Reset receiver**
- **Upgrade firmware**

Factory defaults

SYS / Setup / Reset / Factory defaults

Select Factory defaults from the Reset list. The following screen appears:



Use this screen to reset the firmware to Trimble factory defaults.

You are prompted to confirm the reset. If you select:

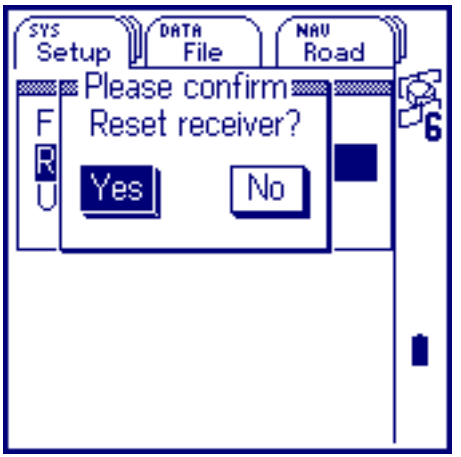
- Yes – the GeoExplorer 3 firmware resets to the factory defaults.
- No – the reset operation is cancelled.

NOTE Resetting to factory defaults does not delete data dictionaries, data files, languages, coordinate systems, or waypoints. However, it does reset the GeoExplorer 3 to the default language (English), the default coordinate system (latitude/longitude on the WGS-84 datum), and the default data dictionary (Generic). Any open data files will be closed.

Reset receiver

SYS / Setup / Reset / Reset receiver

Use the Reset receiver option to reset the receiver. Select Reset receiver from the Reset list. The reset receiver screen appears:



Use this screen to reset the receiver.

You are prompted to confirm the reset. If you select:

- Yes – the GeoExplorer 3 receiver is reset.
- No – the reset operation is cancelled.

NOTE Normally it is quite unnecessary to reset the GeoExplorer 3 internal GPS receiver, but, if for some reason the receiver malfunctions, resetting it can often fix the problem.

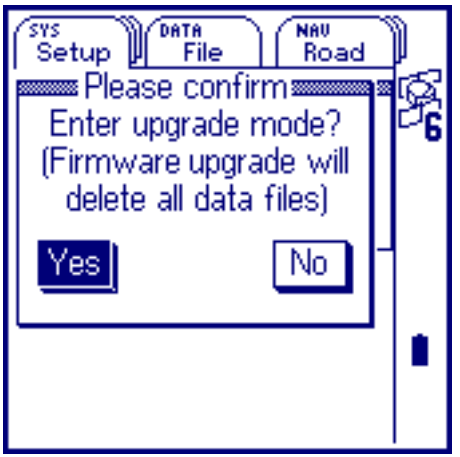
CAUTION Resetting the internal GPS receiver will delete the current almanac and perform a warm boot. The receiver may take up to three minutes to reacquire signals from the GPS satellites. If the GeoExplorer 3 fails to acquire GPS satellite signals within three minutes, you should contact your nearest Trimble Assistence Center (TAC) for advice.

NOTE Although resetting the receiver deletes the almanac file, it does not affect any other files or settings on the GeoExplorer 3.

Upgrade firmware

SYS / Setup / Reset / Upgrade firmware

Use the Reset list to prepare the GeoExplorer 3 to upgrade the firmware. Select Upgrade firmware from the Reset list. The Upgrade firmware screen appears:



Use this screen to begin the firmware installation process.

You are prompted to confirm the reset. If you select:

- Yes – the GeoExplorer 3 is placed in upgrade mode.

  For more details see **Installing the firmware**.

- No – the upgrade operation is cancelled.

WARNING Upgrading the firmware deletes all data files, waypoints, configuration settings, data dictionaries, user-loaded languages, and coordinate systems.

THE DATA SECTION

Use the DATA section to open data files, collect new data, update existing data, and view GPS data graphically.

Press DATA to move between the tabs in the DATA section.

The DATA section has four tabs:

- **The File tab**
- **The New tab**
- **The Update tab**
- **The Map tab**

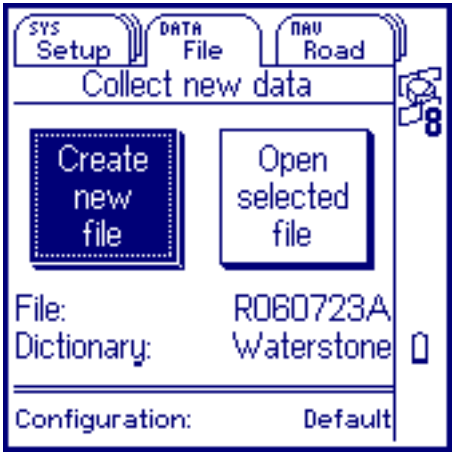
NOTE The New, Update, and Map tabs are visible only when a data file is open.

NOTE The Map tab is not available with the **GeoExplorer 3c edition**.

The File tab

DATA / File

To display the File tab, press DATA. The File tab appears if no data file is open. (When a data file is open the File tab is not available.) The Collect new data form appears:



Use this tab to create a new data file or open an existing one. Use it to change a filename and select the data dictionary that you want to use.

Press OPTION to view the **File option list**.

The Collect new data form contains:

- **Create new file**
- **Open selected file**
- **File**
- **Dictionary**
- **Configuration**

Use this button ...	To ...
Create new file	Create a new rover data file. When the Create new file button is highlighted, the Collect new data form appears. When all fields in the form are correct, press ENTER. This accepts the new **File** name and **Dictionary**. A new rover data file is created and **The New tab** appears.
Open selected file	Open a selected rover data file. When the Open selected file button is highlighted, the Update existing data form appears. Use the File field to select the file to be opened. Press ENTER. The Update tab appears. The data dictionary associated with the file is the data dictionary that was selected when that file was created. **NOTE** If a data file was created more than seven days ago, the GeoExplorer 3 data collection system will not let you reopen it for further logging of data (although you can review and edit it). This technical limitation relates to the way in which GPS times are stored. To maintain accurate storage, it is necessary to limit the time-span of a data file to seven days.

Use this field ...	To ...
File	Accept the default filename for the new file, edit the filename, or select an existing file to open. When Create new file is highlighted, press ENTER to edit the filename. When Open selected file is highlighted, press ENTER to see a list of the files stored in the GeoExplorer 3 handheld. The GeoExplorer 3 automatically generates a filename for new files. It uses the following formula: R MM DD HH X • where R is the **Filename prefix**, • MM is the current UTC month, • DD is the current UTC day of the month, • and HH is the current UTC hour of the day. The X increments within this hour, starting at 'A' for the first file in that hour, then 'B' for the second file, and so on. To edit the filename, highlight the File field and press ENTER. Use the **Text entry** field that appears to make changes to the filename. **NOTE** The auto-generated filename is only a suggestion. You can alter the suggested name or enter an entirely different one. Filenames must be not more than 20 characters long.

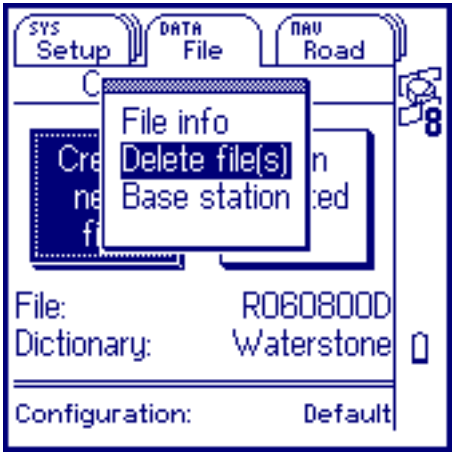
Use this field ...	To ...
Dictionary	Select a data dictionary from the list of data dictionaries currently loaded on the GeoExplorer 3 data collection system. When Create new file is highlighted, the default data dictionary is the one most recently loaded to the GeoExplorer 3 using the Pathfinder Office software. To select a dictionary, highlight the Dictionary field and press ENTER. The list of available dictionaries appears. When Open selected file is highlighted, the data dictionary is the one associated with the selected file. The "Generic" data dictionary is always available. It lets you record point, line, and area features, each with a simple descriptive attribute. You can use the GeoExplorer 3 to edit and create **Data dictionaries**. **NOTE** The data dictionary selected when creating a data file is permanently associated with that file. It determines what types of features can be recorded to the file, and what attributes the features have. **NOTE** When a file is on the GeoExplorer 3, you can only add to the associated data dictionary. You cannot make changes to existing items, or delete items from it.

Use this field ...	To ...
Configuration	View the configuration that is currently loaded in the GeoExplorer 3 data collection system. This configuration is Default configuration, or the one most recently uploaded to the GeoExplorer 3 using the Pathfinder Office software. You can use the GeoExplorer 3 data collection system to edit the configuration. For more information see **Configurations**.

File option list

DATA / File / OPTION

When the File tab is active, press OPTION to display the available options.



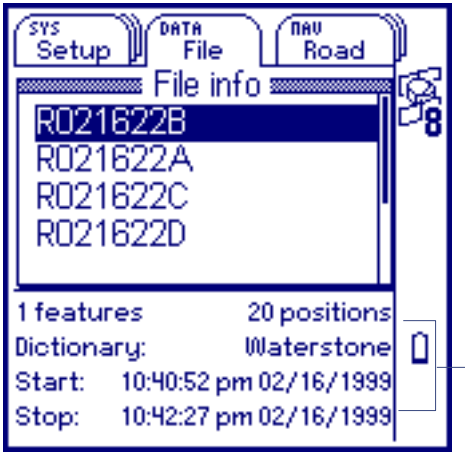
The options are:

- **File info**
- **Delete file(s)**
- **Base station**

File info

DATA / File / OPTION / File info

Select File info from the File option list. The File info list appears:



Use this list to view information about all data files stored on the GeoExplorer 3 data collection system, and edit or change the name of a data file.

The File info list displays the following:

- **List of files**
- **Dictionary**
- **Number of features**
- **Start**
- **Number of positions**
- **Stop**

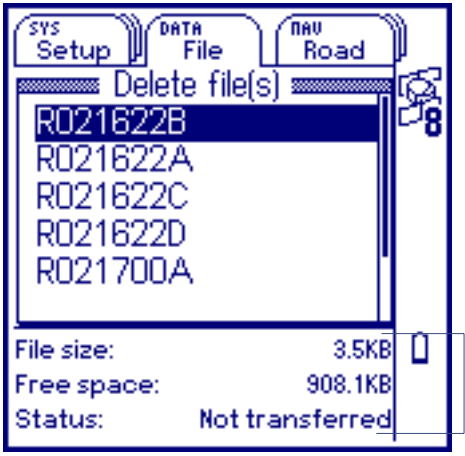
To edit a file name, select it from the list. A **Text entry** field appears. Edit the file name.

Information	Description
List of files	Use the list to select a file. The relevant information is displayed in the message box. As you scroll through the list, the displayed information changes accordingly.
Number of features	This number indicates the number of features that are recorded in the highlighted file.
Number of positions	This number indicates the total number of GPS positions that are stored in the highlighted file.
Dictionary	This field indicates the data dictionary that is associated with the highlighted file.
Start	This field shows the time and date of the first GPS position logged to the highlighted file.
Stop	This field shows the time and date of the last GPS position logged to the highlighted file.

Delete file(s)

DATA / File / OPTION / **Delete file(s)**

Select Delete file(s) from the File option list. The Delete file(s) list appears:



Use this list to delete rover and base data files. To delete a file, highlight it and press ENTER. You are prompted to confirm the deletion.

Press OPTION to display the **Delete file(s) option list**.

The Delete file(s) screen displays the following:

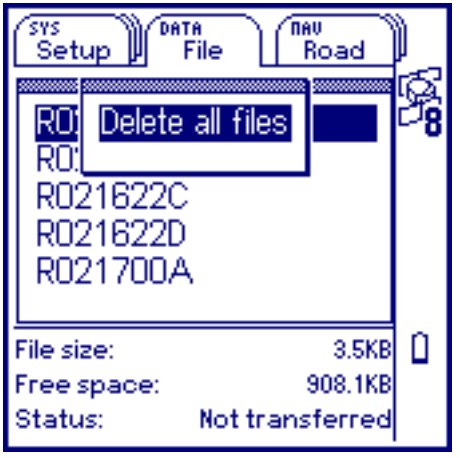
- **List of files**
- **File size**
- **Free space**
- **Status**

Information	Description
List of files	Use this list to select the file(s) to be deleted. Information about the highlighted file is displayed in the message box. As you scroll through the list of files, the displayed information changes accordingly.
File size	The size of the highlighted file, in kilobytes (KB).
Free space	The amount of free space remaining in the GeoExplorer 3 data collection system, in kilobytes (KB).
Status	Indicates whether the highlighted file has been transferred from the GeoExplorer 3 data collection system to an office computer.

Delete file(s) option list

DATA / File / OPTION / Delete file(s) / OPTION

Press OPTION from the Delete file(s) list to display the available options.

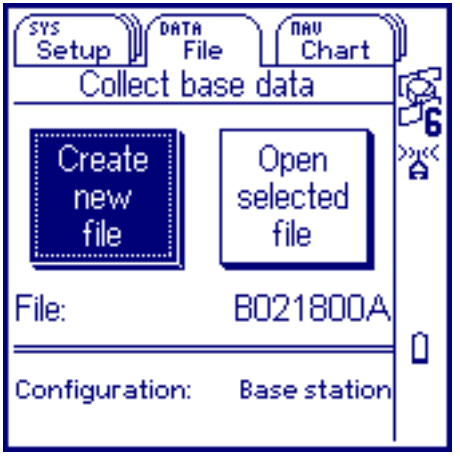


Use the Delete all files option to delete all rover and base files from the GeoExplorer 3 handheld. You are prompted to confirm the deletion. The GeoExplorer 3 displays a warning when you delete files which have not been transferred to the office computer.

Base station

DATA / File / OPTION / Base station

Select Base station from the option list. The Collect base data form appears:



Use this form to create a new base file or open an existing one. A base station is used to collect base data.

The Collect base data form displays the following:

- **Create new file**
- **Open selected file**
- **File**
- **Configuration**

NOTE The Open selected file button only appears if there are base files in the GeoExplorer 3 data collection system.

Plan carefully for the roving unit(s) and the base station. Make sure the base station is recording data at the same time that the roving unit is recording positions. The satellites tracked by the rover must be included among the satellites tracked by the base station.

The further a rover is from the base, the greater the risk that it will track a satellite that the base station cannot see. Think about potential obstructions such as hills or buildings that can block a satellite signal to the base station.

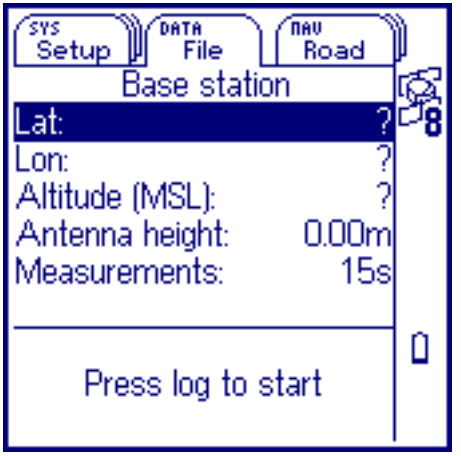
While the GeoExplorer 3 handheld is logging data to a base station file, you cannot create a new rover data file or open an existing one.

NOTE The GeoExplorer 3 data collection system automatically uses 12 channels to receive GPS signals when you use it as a base station.

Create new file

DATA / File / OPTION / Base station

To create a new base data file with the name indicated in the File field, select the Create new file button. The Base station form appears:



Use this form to enter the base station reference position and the logging information that controls how the GeoExplorer 3 logs base station data.

Press LOG to start **Logging base file data**.

Press OPTION to view the **Base station option list**.

The following fields are available in the Base station form:

- **Lat**
- **Lon**
- **Altitude (MSL)**
- **Antenna height**
- **Measurements**

When you create a new base file the GeoExplorer 3, by default, automatically uses the last reference position entered. If no position has been entered, Lat, Lon, and Altitude values appear as “?”.

If you provide a reference position for the base station, you must enter values for all position fields (Lat, Lon, and Altitude).

You can enter the reference position from a map, or from the results of a previously conducted control survey.

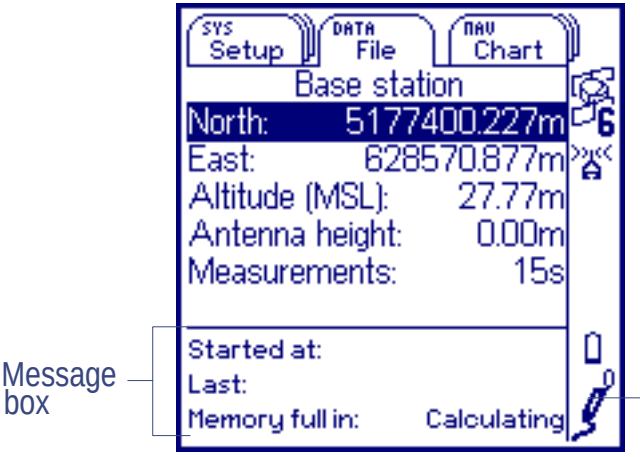
TIP For greatest accuracy, make sure that the position logging interval for each GPS rover is an exact multiple of the measurement logging interval at the base station. If you set the position logging interval to a value that is not an exact multiple of the base station’s measurement logging interval, the differential correction program has to compute interpolated differential corrections. These are less accurate than those computed when the logging intervals of the base station and rover(s) are synchronized.

Use this field...	To...	Default value
Lat	Enter the latitude of the base station. This is a **Numeric entry** field.	Last value entered
Lon	Enter the longitude of the base station. This is a numeric entry field.	Last value entered
Altitude (MSL)	Enter the altitude (**MSL**) of the base station. This is a numeric entry field.	Last value entered
Antenna height	Enter the antenna height. This is a Numeric entry field. **NOTE** It is important that you enter the antenna height correctly, as the Pathfinder Office software uses this height to transform the reference position (on the ground) into the position of the GPS receiver's Antenna Phase Center (APC). This APC is used by the Differential Correction utility in Pathfinder Office.	0.0 m

Use this field...	To...	Default value
Measurements	Enter the measurement logging interval of the base station. The primary task of a GPS base station is to log raw GPS measurements from satellites for use when differentially correcting rover files. To provide accurate differential corrections, raw measurements should be logged reasonably often. The maximum permitted measurement logging interval is 30 seconds. You can reduce the interval to a minimum of one second, but this will result in up to 30 times as much data being logged by the GeoExplorer 3. The default setting of 15 s provides a good compromise between the quality of postprocessed positions and the storage space and processing time required.	15 s

Logging base file data

To start logging base file data, press LOG. Logging information is displayed in the message box.

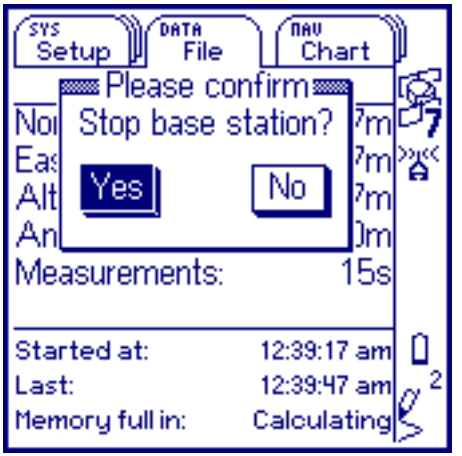


The message box at the bottom of the screen displays information about the base file. The logging icon appears in the **Status bar**. It indicates how many GPS positions have successfully been logged to the file.

The message box displays the following:

- **Started at**
- **Last**
- **Memory full in**

To stop using the GeoExplorer 3 as a base station, press CLOSE. You are prompted to confirm whether you want to stop logging base station data.



Information	Description
Started at	The time that the base station started logging to the data file.
Last	The time that the base station stopped logging to the data file.
Memory full in	The time remaining before the data storage space is full. This value is computed after every 10 measurements logged.

Open selected file

DATA / File / OPTION / Base station

To open an existing base file, highlight the Open selected file button in the Collect base data form. Select the File field. A list of base files appears. Select the file to be opened. Highlight the Open selected file button and press ENTER. The Base station form appears. Use this form to enter the base station reference position, antenna height, and measurement logging interval. For more information about the Base station form see **Create new file**.

NOTE When you open an existing base file, the GeoExplorer 3 automatically uses the reference position that was entered when the file was created.

NOTE Changing the reference position while logging a base file will overwrite the previously entered reference position.

File

DATA / File / OPTION / Base station

Use the File field to edit (change) the name of a base data file, or to view the list of base data files currently loaded on the GeoExplorer 3 data collection system.

When the Create new file button is highlighted, the GeoExplorer 3 automatically generates a file name for a new base data file. It is uses the formula: B MM DD HH X

- Where the B is the **Filename prefix**,
- MM is the current **UTC** month,
- DD is the current UTC day of the month, and
- HH is the current UTC hour of the day.

The X increments within this hour, starting at 'A' for the first file in that hour, then 'B' for the second file, and so on. For example, B052523C is the name assigned to the third file ('C') created on May 25th, between 23 00 and 24 00 hours.

The auto-generated file name is only a suggestion. You can change it or enter an entirely different name. To edit the file name, highlight the File field and press ENTER. Use the **Text entry** field that appears to change the filename.

When the Open selected file button is highlighted, select File. A list of base files appears. Use this list to select the file to be opened.

Configuration

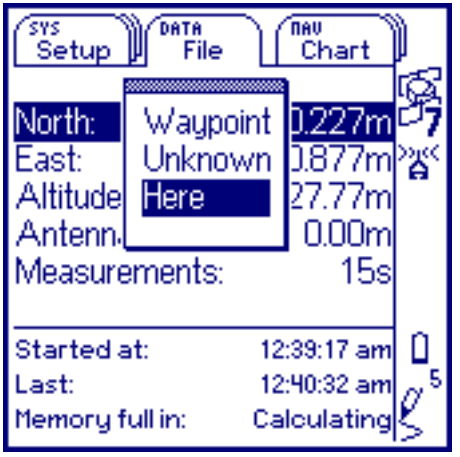
DATA / File / OPTION / Base station

Use the Configuration field to view the name of a configuration file that is used with the base data file. This field cannot be changed and the configuration cannot be edited.

Base station option list

DATA / File / OPTION / Base station / OPTION

Press OPTION from the Base station form to display the available options.



The options are:

- **Waypoint**
- **Unknown**
- **Here**

Use this option...	To...
Waypoint	Automatically fill in the reference position fields with the location of a previously recorded waypoint. Select this option to display a list of waypoints. Use the list to select the waypoint that you want to assign as the base station reference position.
Unknown	Assign null values to the base station reference position fields. **NOTE** You do not have to enter a reference position in the field, but a reference has to be entered in the Differential Correction utility in the Pathfinder Office software.
Here	Automatically fill in the reference position fields with the current GPS position (if any).

The New tab

DATA / **New**

To display the New tab, press DATA until the New tab is active. If no data file is open, **The File tab** appears. If a data file is open, the New feature list appears:

To start a new feature, press △ or ▽ to highlight it in the list. Then press ◁ or ▷ to highlight the **Now** or **Later** button, depending on when you want the GeoExplorer 3 to start logging GPS positions for that feature. Press ENTER. An attribute entry form appears.

Use this form for **Entering attribute values**.

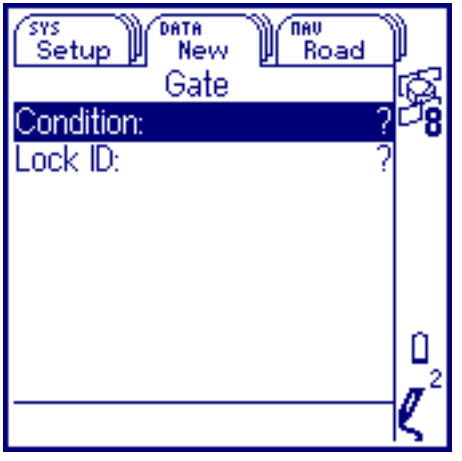
TIP Use the **Advanced datalogging options** function to start logging GPS positions before selecting a feature.

Use this option ...	To ...
Now	Start logging GPS positions for the selected feature. The selected feature and GPS data collection are started simultaneously. The logging icon appears in the **Status bar** when the GeoExplorer 3 is logging GPS positions. The default for logging GPS positions is Now.
Later	Log GPS positions for the selected feature. The selected feature is started first. The GPS positions are collected later and assigned to that feature. The pause logging icon in the status bar flashes to indicate that the GeoExplorer 3 is not currently storing GPS positions for the selected feature. To start logging, press LOG. For more information see **Pause and resume logging**. The Later option is useful if you want to enter the attributes for a feature, but you are not yet at the feature. For example, if you see a tree feature in the distance, select the Later option and enter the attributes for the tree as you walk towards it. When you reach the tree, press LOG to start logging positions. When you are finished, press CLOSE to store the attributes and positions.

Entering attribute values

DATA / New / <Feature>

When you select a feature from the New feature list, an appropriate attribute entry form appears:



Use the <feature name> form to enter attribute values for the feature.

Press OPTION to view the **Attribute entry form option list**.

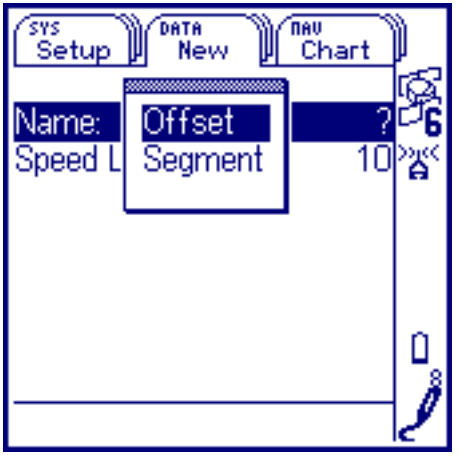
To enter a value for an attribute, select the attribute. The appropriate data entry field appears—**Pop-up list**, **Numeric entry**, or **Text entry**. Use this field to enter the value. When you have entered attribute data and collected positions for the feature, press CLOSE. The feature is stored and the New feature list reappears. (See **Storing features**.)

To discard a feature, press Fn CLOSE. You are prompted to confirm that you want to abandon changes. This will discard the feature attributes and positions.

Attribute entry form option list

DATA / New / <Feature> / OPTION

Press OPTION to display the options available in the attribute entry form.



The options that appear depend on the type of feature selected. When a point or area feature is selected the only option is Offset. When a line feature is selected, Offset and Segment are both available.

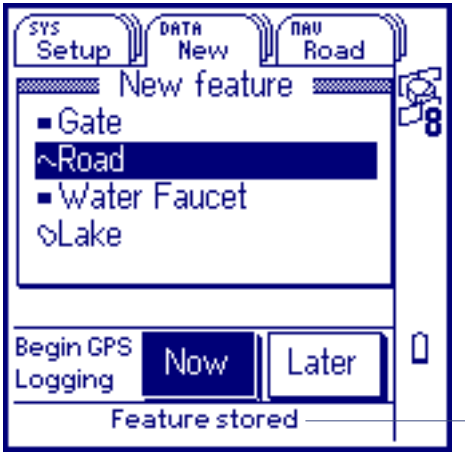
The options are:

- **Offset**
- **Segment**

Use this option ...	To ...
Offset	Create an offset for this feature only. Press OPTION and select Offset. The Offset form appears. Use this form to enter the offset information. For more information see **Advanced data collection**.
Segment	Segment a line feature. Press OPTION and select Segment. For more information see **Advanced data collection**.

Storing features

To save the contents of an attribute entry form and store the positions for the feature, press CLOSE. A message is displayed briefly in the message bar, at the bottom of the New feature list. The message indicates that the feature was stored successfully.



To abandon a feature and return to the New feature list, press Fn CLOSE.

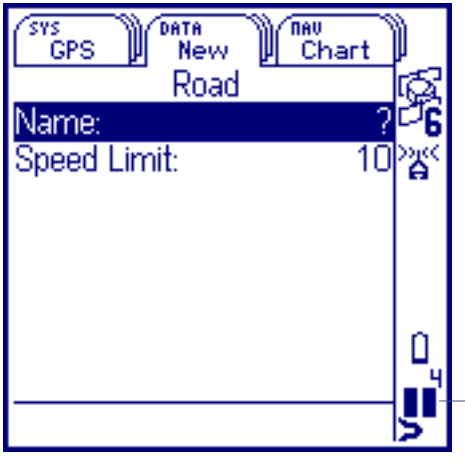
You may not want to press CLOSE as soon as you have entered attributes for a feature. While the feature is 'active' (while you are in the attribute entry form), any GPS positions that are logged are associated with that feature. If recording a point feature, remain stationary at the feature until the minimum number of positions has been logged before pressing CLOSE. If recording a line or area feature, continue to walk or drive along the feature or around the perimeter until you have traversed the feature completely before pressing CLOSE.

If you are collecting a feature and you press CLOSE before the minimum number of positions has been logged, the GeoExplorer 3 prompts you to confirm whether you want to store the feature.

If you select Yes, the GeoExplorer 3 stores the current number of GPS positions. If you select No, the attribute form reappears, and the GeoExplorer 3 continues to record GPS positions for the selected feature.

Pause and resume logging

When the GeoExplorer 3 handheld is logging GPS positions, the logging icon appears in the **Status bar**. Press LOG to pause logging. While paused, the GeoExplorer 3 stops logging GPS positions and the pause icon flashes over the logging icon in the status bar.



Use the pause function to stop briefly or if you are collecting a line or area feature and have to travel around some obstacle before picking up the line or area perimeter again.

When GPS logging is paused, the GeoExplorer 3 does not record GPS positions, or velocities. It does continue to record carrier measurements (if the feature is configured for high **Accuracy**) and certain critical GPS information required for postprocessing.

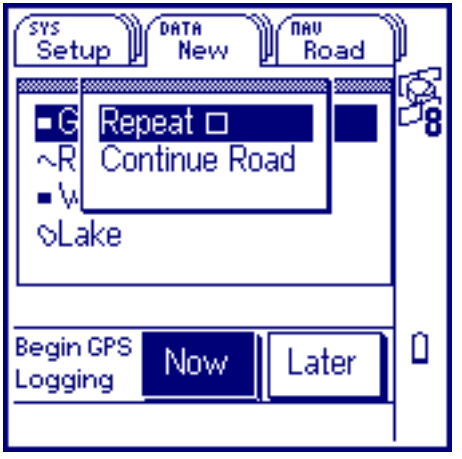
To resume logging GPS, press LOG again. The pause icon stops flashing and the logging icon appears again. Each time you resume logging while collecting a line or area feature, the GeoExplorer 3 data collection system logs a GPS position (regardless of the logging interval that you have set for line/area features).

NOTE Pause and resume logging can only be used when you are logging to a rover data file. You cannot do this when logging GPS data to a base station file.

New feature option list

DATA / **New** / OPTION

Press OPTION from New feature list to display the available options.



The options are:

- **Repeat**
- **Continue <feature>**

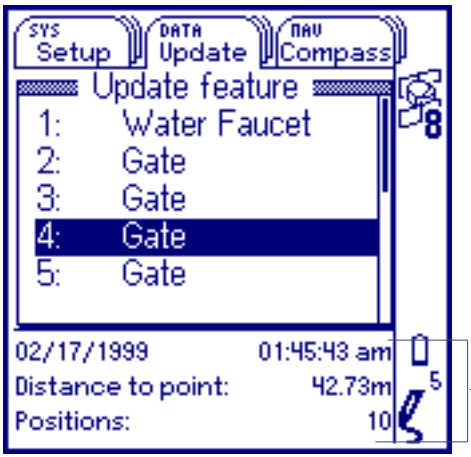
Use this option ...	To ...
Repeat	Repeat a feature. Press OPTION and select Repeat. A ✓ appears in the check box to the right of the Repeat option. For more information see **Repeating features**.
Continue <feature>	Continue a line or area feature. Press OPTION and select Continue <feature>. The attribute entry form reappears. **NOTE** While traversing a line or area feature you can collect point features using the Continue option. For more information see **Continuing line and area features**.

The Update tab

NOTE Data update, using transferred .ssf files, is not available with the **GeoExplorer 3c edition**.

DATA / Update

To display the Update tab, press DATA until the Update tab is active. If a data file is not currently open, **The File tab** appears. When a data file is open, the Update feature list appears:



To update a feature, select it from the list. An attribute entry form appears.

The message box at the bottom of the screen displays:

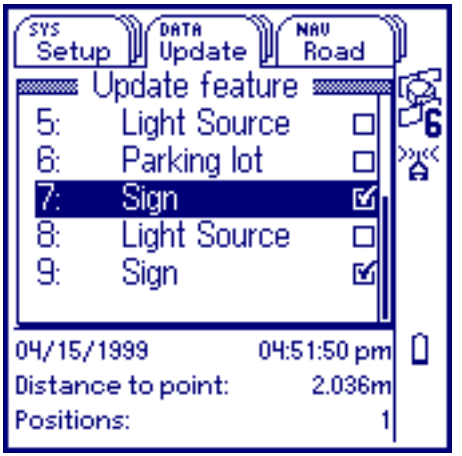
- **Date and Time**
- **Distance to point**
- **Positions / Length / Area**

Information	Description
Date and Time	The date and time when the highlighted feature was collected or last updated.
Distance to point	The distance from your current position to the highlighted feature.
Positions / Length / Area	The number of positions logged for the highlighted **point** feature. The computed length of the highlighted **line** feature. The computed area of the highlighted **area** feature.

Updating attribute values

DATA / **Update** / **<Feature>**

When a file is transferred from the Pathfinder Office software a check box appears to the right of each feature.



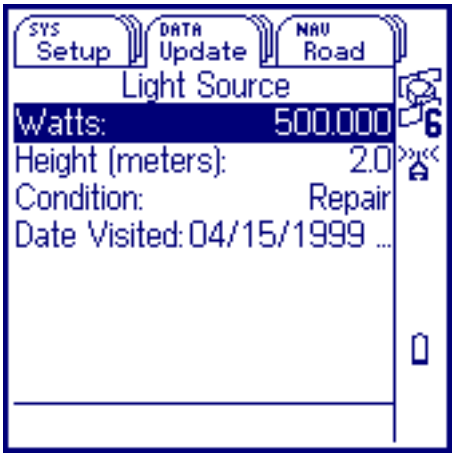
If a check box is empty, the feature is not updated.

If the check box contains a ✓, the feature is updated.

NOTE When no features are stored in the file, the Update feature list is empty. A message indicates that there are no features.

NOTE The ✓ and ☐ symbols will not appear on the GeoExplorer 3c edition. The GeoExplorer 3c edition does not support transferred .ssf files from Pathfinder Office.

To update a feature select it from the Update feature list. An attribute entry form appears:



Use the form to edit the attribute values for the feature.

Press OPTION to display the **Update attribute option list**.

To edit the value for an attribute, select it. The appropriate data entry field appears—**Pop-up list**, **Numeric entry**, or **Text entry**.

When you have edited the attribute data, press CLOSE. The updated information is stored and the Update feature list reappears. A ✓ indicates that the feature has been updated.

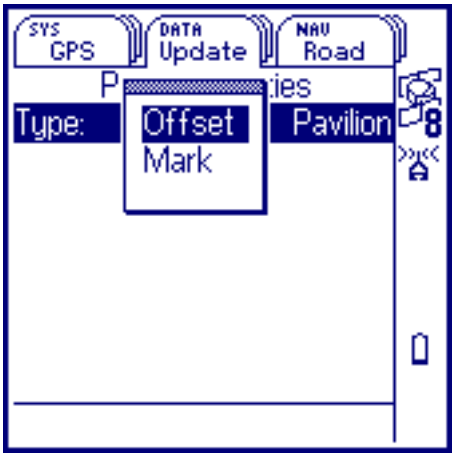
To abandon a feature, press Fn CLOSE. You are prompted to confirm this cancellation.

NOTE The ✓ that indicates that a feature has been updated only applies to files transferred from Pathfinder Office. No ✓ appears when you update features collected during a current data collection/update session.

Update attribute option list

DATA / Update / <Feature> / OPTION

Press OPTION from the attribute entry form to display the option list.



The options are:

- **Offset**
- **Mark**

NOTE The Mark option only appears when the updated file has been transferred from Pathfinder Office.

Use this option ...	To ...
Offset	Create an offset for the selected feature in the update feature list (see **Offsets**).
Mark	Place a ✓ in the check box next to the selected feature. When you update the attributes or GPS data for a feature, a ✓ automatically appears in the check box. Use this option to manually insert a ✓ to mark the feature as updated.

Updating GPS data

To update the GPS data for a feature, select it from the list. The attribute entry form appears. Press LOG. The GeoExplorer 3 data collection system starts logging GPS positions. Depending on how the **Allow GPS update** and **Warning distance** fields are configured, the GeoExplorer 3 prompts you to confirm the GPS update. (Use the **Data** form in the Setup tab to configure these fields.)

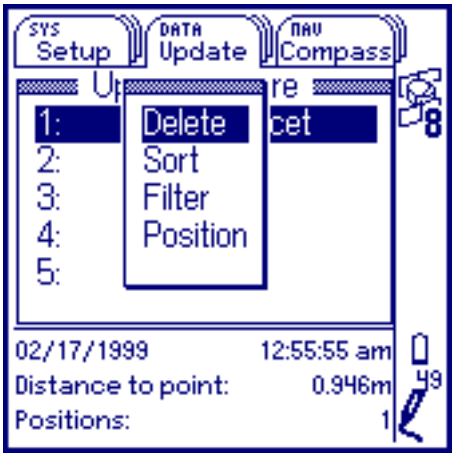
If you select Yes, the GeoExplorer 3 starts logging GPS data and replaces the existing GPS data. If you select No, it does not log new GPS data.

When you have finished collecting positions for a feature, press CLOSE. The updated information is stored and the Update feature list reappears. The new GPS positions replace the existing position for the selected feature and a ✓ appears next to the feature to indicate that it is updated.

Update feature option list

DATA / **Update** / OPTION

Press OPTION from the Update feature list to display the option list.

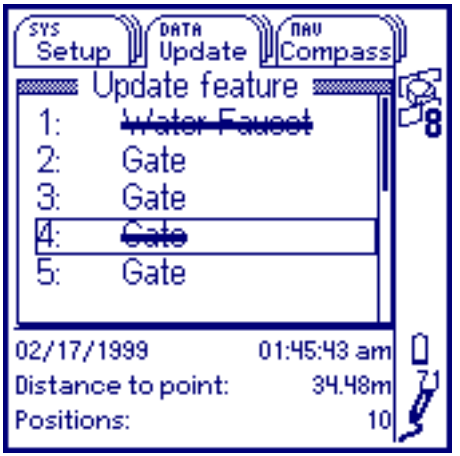


The options are:

- **Delete / Undelete**
- **Sort**
- **Filter**
- **Position / Summary**

Delete / Undelete

To delete a feature from the **Update feature option list**, highlight it. Press OPTION and then select Delete. A line appears through the deleted feature.



In this example, features 1 and 4 are deleted. This is indicated by the line through the feature name.

To restore a deleted feature from the Update feature list, highlight it. Press OPTION and select Undelete. The line disappears from the feature name.

NOTE Deleted features do not appear on the Map or the Chart.

NOTE The Pathfinder Office software transfers deleted features to the office computer, but it does not export them to the GIS.

Sort

To sort the **Update feature option list**, press OPTION and select Sort. A sublist appears (see **Sublists**). The options are:

- **Feature**
- **Time**
- **Distance**

NOTE Sort is applied at the time you select it. New features appear at the end of the list regardless of the sorting order.

Use this option ...	To ...
Feature	Sort by feature name.
Time	Sort by the time recorded, from first to last.
Distance	Sort by distance to start of feature, from closest to furthest away.

Filter

Filtering on the GeoExplorer 3 is a method of selectively viewing features based on a set of criteria set out below.

To filter the **Update feature option list**, press OPTION and select Filter. A sublist appears (see **Sublists**). The options are:

- **Feature**
- **Time**
- **Status**
- **None**

NOTE A filter remains in effect until a file is closed. New features may not appear in the update feature list, depending on how the list is filtered.

NOTE Each new filter replaces the previous one.

Use this option ...	To ...
Feature	Filter the Update feature list based on feature type. Select the Feature option. A checklist appears (see **Checklists**). Select the feature type(s) that you want to filter. If you select the Gate feature, for example, the Update feature list is filtered and only Gate features are displayed.
Time	Filter the Update feature list based on the time or date that a feature was started. For example, you can display only those features collected on May 26th, between 9:00 am and 12:00 pm. Select the Time option. A form appears with the four fields: Start time, Start date, End time, and End date. Filter the list using one or more of these fields. To edit a field, select it and use the **Numeric entry** field to enter a value.

Use this option ...	To ...
Status	Filter the Update feature list based on the current status of the features. For example, you can use this option to display only those features that are new (collected during the current session). Select the Status option. A checklist appears with the options: • Deleted • Not deleted • New • Imported • Updated Select the status that you want to filter. The Update list is filtered and only features with that status appear.
None	Remove all filters from the Update feature list.

Position / Summary

To view the GPS position of the feature highlighted in the **Update feature option list**, press OPTION and select Position. The coordinates of the highlighted feature appear in the message box at the bottom of the screen. For point features, the position displayed is the average GPS position. For line and area features, the position displayed is the start point of the feature.

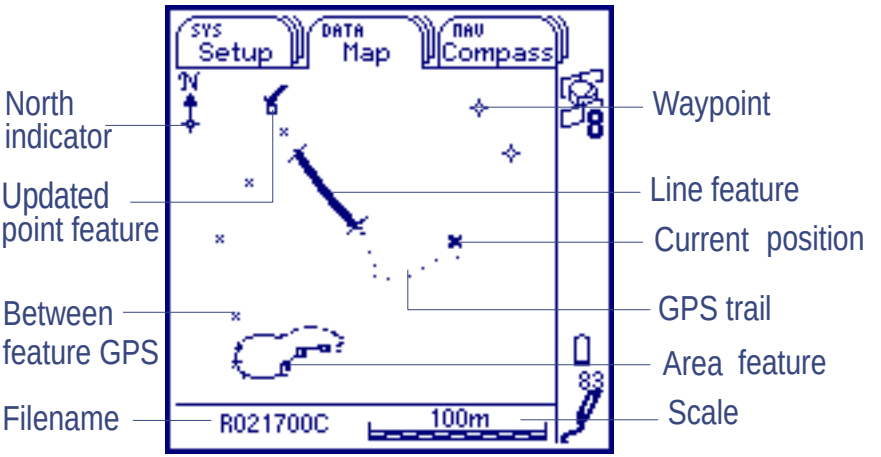
When the Position option is selected, you can change the message box display to show summary information. To do this, press OPTION and select Summary.

The Map tab

NOTE The Map tab is not available with the **GeoExplorer 3c edition**.

DATA / **Map**

To display the Map tab, press DATA until the Map tab is active. If no data file is open, the **The File tab** appears. If a data file is open, the Map tab appears:



Use this tab to view and select features for update. It is a graphical view of the Update feature list that you access from **The Update tab**.

Press OPTION to view the **Map option list**.

The Map screen displays:

- North indicator (N)
- Current position
- Features
- GPS trail
- Filename
- Between feature GPS
- Waypoint
- Scale

NOTE There are two map screens available on the GeoExplorer 3, the DATA Map and the NAV Chart. Use the Map tab, in the DATA section, to view, select, and update features. Use the Chart tab, in the NAV section, to navigate to features and waypoints.

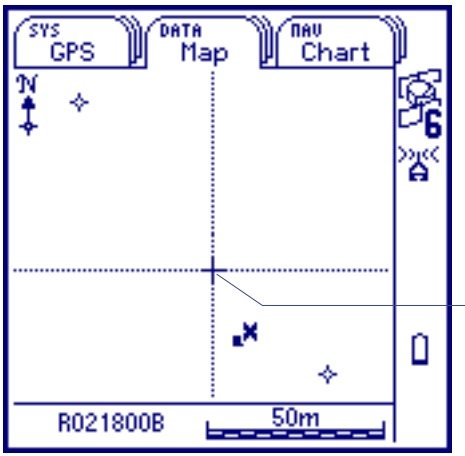
Item	Description
North indicator (N)	North direction.
Current position	Your current GPS position.
Features	Point, line, and area features. Each feature type appears as a different symbol on the map. The ✓ on a feature indicates that the feature is updated.
Scale	The scale of the screen. As you zoom in/out, the scale changes accordingly.
Filename	The name of the data file that is currently open.
Waypoint	Waypoints on the GeoExplorer 3.
GPS trail	A trail of dots that shows the path you have taken.
Between feature GPS	A trail of small crosses that show all positions logged between features.

Using the Map tab

The Map tab is similar to **The Update tab**. You can perform all the same tasks using it as you can using the Update feature list. The Map tab and Update feature list are related. When you select a feature on the map, the same feature is selected in the Update feature list, and vice versa. If you delete a feature on the map, that feature is deleted from the list.

TIP To move between these two tabs, press DATA.

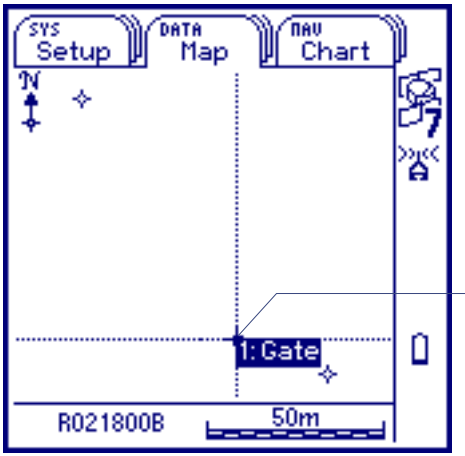
To display the cursor, press an arrow key.



If the selected feature is visible, the cursor initially appears over it. If the selected feature is not visible, the cursor appears at the last location on the screen (if that is visible). Otherwise, the cursor appears in the center of the screen.

To move the cursor, press the arrow keys. To move it diagonally, press two arrow keys at the same time.

Use the cursor to select a feature on the map. When the cursor is close to a feature, the symbol for that feature is highlighted and the name of the feature displayed. The feature is selected. As the cursor moves away from a highlighted feature, the name disappears. However, the feature remains selected (highlighted) until another feature is selected.



Selected feature

In this example, the Gate feature is currently selected.

When the cursor moves to the edge of the map, the map automatically pans (half a screen width) in the direction of the cursor movement. The cursor remains in the same geographic position. In these circumstances, the current GPS position may not be visible.

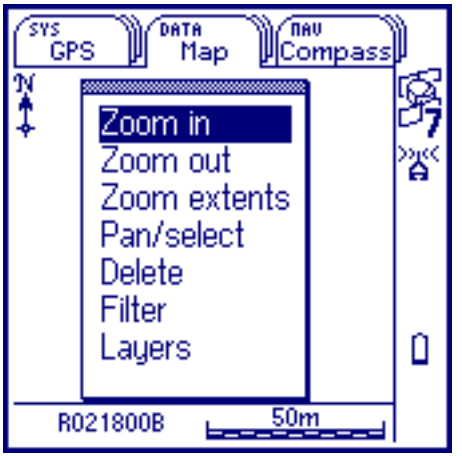
Alternatively, press Fn ◁, Fn ▷, Fn △, or Fn ▽ to pan the screen (half a screen width). You cannot pan across the screen unless the cursor is visible.

To remove the cursor, press CLOSE. If the current GPS position is not visible, the screen automatically pans until the current GPS position symbol is in the center of the screen.

Map option list

DATA / **Map** / OPTION

Press OPTION to display the available options for the Map.



The options are:

- **Zoom in**
- **Zoom out**
- **Zoom extents**
- **Pan/select**
- **Delete**
- **Filter**
- **Layers**

Use this option ...	To...
Zoom in	zoom in to the map screen. Press OPTION and select Zoom in. This magnifies the display (by decreasing the scale). The scale on the bottom of the screen adjusts accordingly. When the cursor is active, the screen zooms in on the cursor. When the cursor is not active, the screen zooms in on the current GPS position.
Zoom out	zoom out of the map screen. Press OPTION and select Zoom out. This lets you see a greater area (by increasing the scale). The scale on the bottom of the screen adjusts accordingly. When the cursor is active, the screen zooms out relative to the cursor. When the cursor is not active, the screen zooms out relative to the current GPS position.
Zoom extents	change the scale so that all selected layers are visible on the map screen. The Zoom extents option varies. What it shows depends on what layers are selected and whether the features are filtered. If nothing is displayed on the screen, the Zoom extents option does not affect the map scale.

Use this option ...	To...
Pan/select	activate the on-screen cursor. Use the on-screen cursor to pan the screen in the direction of the cursor movement. You can also use the cursor to select features on-screen.
Delete	Delete a feature from the map. To do this, highlight it, press OPTION and select Delete. A line appears through the deleted feature in the Update feature list and the feature is deleted from the map. **NOTE** To restore deleted features use the **Update feature option list**.

Use this option ...	To...
Filter	Filter the features that appear on the map screen. Select the Filter option. A sublist appears with the options: • Feature – Filters the feature based on the feature names. • Time – Filters the features based on the time or date a feature was started, or the time or date it was ended. • Status – Filters the features based on the current status of the features. • None – Removes all filters. For more information see **Filter**.

Use this option ...	To...
Layers	Specify the layers displayed on the map screen. Select the Layers option. A checklist appears with the layers: • Feature – Displays the features stored in the current data file. When this is selected, features are displayed on the map screen. • Waypoint – Displays the waypoints stored on the GeoExplorer 3. When this is selected, waypoints are displayed on the map screen. • GPS trail – Displays a trail of dots that shows the path you have taken. When this is selected, a trail of dots is displayed on the map screen. This trail grows to a length of 60 positions. Old positions then drop off as new ones are added. • Between feature GPS – Displays a trail of small crosses that show all positions logged between features (see **Log between features**). • Updated – Displays a ✓ on features that are updated. For line and area features the ✓ appears at the start point. For more information see **The Update tab**. By default, all layers are selected except GPS trail.

THE NAV SECTION

Use the NAV section to navigate to features and waypoints. Each tab in the NAV section provides a different way of navigating. With the Road tab, you navigate using a road screen; with the Compass tab, a compass; and with the Chart tab, you use a map to navigate to a feature or waypoint. Choose the navigation method that suits your current situation or personal preference.

Press NAV to move between the tabs in the NAV section.

The NAV section has three tabs:

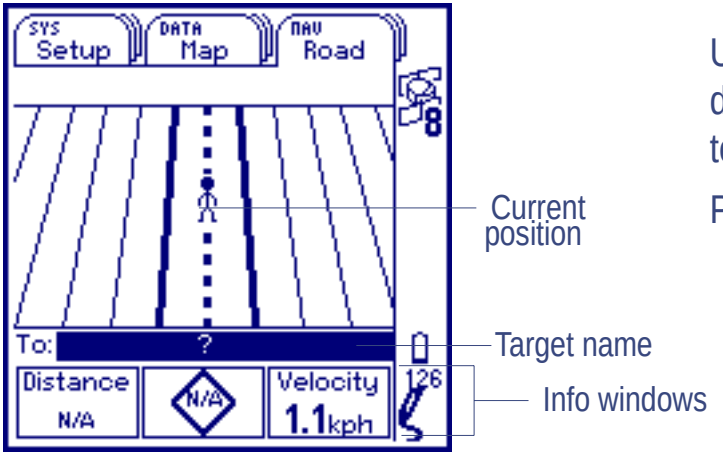
- **The Road tab**
- **The Compass tab**
- **The Chart tab**

NOTE The Chart tab is not available with the **GeoExplorer 3c edition**.

The Road tab

NAV / Road

To display the Road tab, press NAV until the Road tab is active. The road navigation screen appears:



Use this tab to navigate to targets and to display information about your location relative to the location of the target.

Press OPTION to view the **Road option list**.

The Road screen contains:

- **Current position**
- **Target name**
- **Info windows**

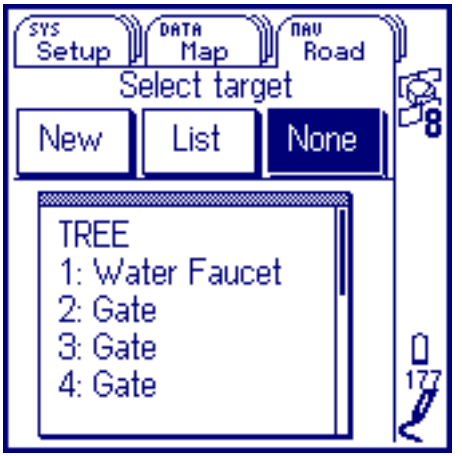
WARNING The Road tab represents a direct line-of-sight path between yourself and the target. ***Do not*** attempt to navigate a vehicle using the information displayed on this screen.

Item	Description
Current position	The person symbol represents your location relative to the target. The person symbol always heads straight ahead, towards the top of the screen. This is your **heading**.
Target name	The target name is the name of the target you are navigating to. A '?' appears when no target is selected.
Info windows	You can configure the Info windows (at the bottom of the screen) to provide navigational information. The Info window is only displayed if one or more items are selected. For more information about configuring Info windows see **Road option list**.

Using the Road tab

Use the Road tab to navigate to targets. To activate navigation, select a target.

To select a target press ENTER. The Select target screen appears:



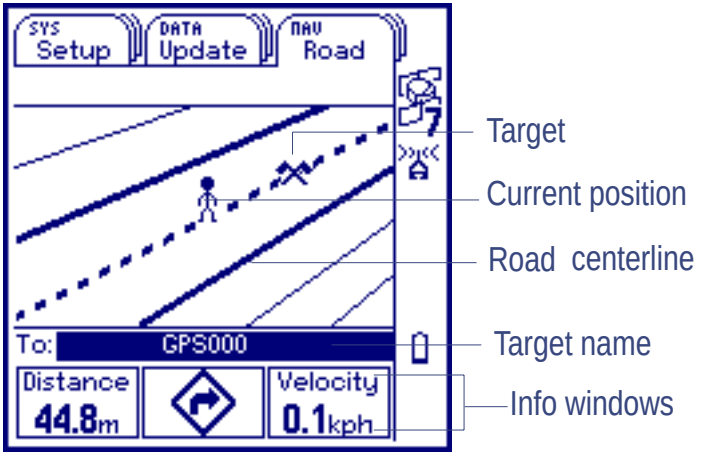
Use this screen to select a feature or a waypoint as your target.

The Select target screen has three buttons:

- **New**
- **List**
- **None**

NOTE You can also select a target using the **Road option list**.

When you select a target, the Road screen animates to navigate you to it. The graphical display shows where you are and where the target is. The animation of the screen shows what action is required. The Info windows, at the bottom of the screen, display navigational information that you can use to navigate to the target.

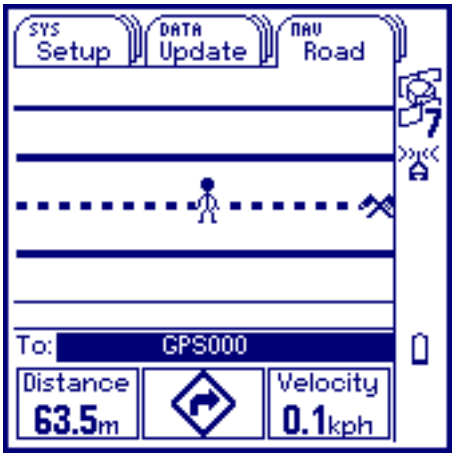


Use the information displayed in this screen to navigate to the selected target.

The heading, or direction you are going, is always towards the top of the screen. To understand this perspective, imagine you are the person symbol and that the view on the screen is from a camera balanced on your shoulder.

When you are on course, the road is displayed vertically in the screen. When you are off course, the road is skewed (at an angle) on the screen. The angle (clockwise or counter-clockwise) that the road is turned depends on how far off course you are.

If you are seriously off course, the screen will look similar to this.

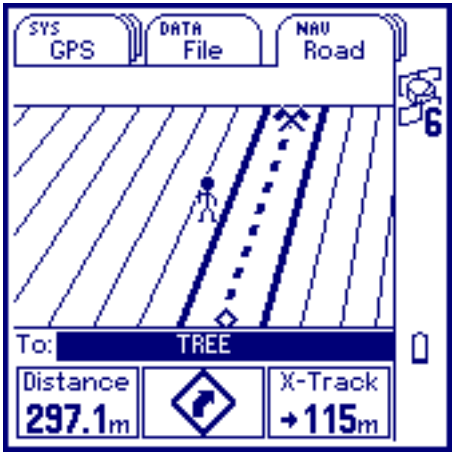


If you are moving in the opposite direction to the target, the person symbol will be ahead of the target symbol.

As you move closer to the target the road width increases and eventually the target moves away from the edge towards the center of the screen. You know that you have reached the target by using the Distance in the Info windows. This is the distance between you and the target.

NOTE The default setting for the Info windows is Distance, Road sign, and Velocity. To change this, see **Info windows**.

In situations where a start waypoint or feature has been specified the road screen will display the cross-track error graphically. When the person symbol moves off the road this means that you have moved away from the line that represents the shortest distance between the start point and the target. The following screen appears:

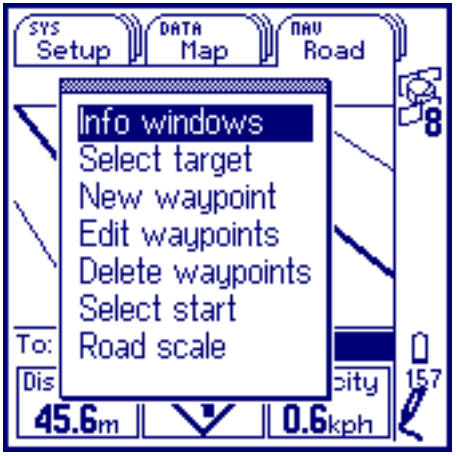


Use this button ...	To ...
New	Enter a new target. When you select this button, the **New waypoint** form appears. Enter the new waypoint information, and press CLOSE. The screen animates and navigates you to the target. For more information see **Using the Road tab**.
List	Select a target from a list of waypoints and features on the GeoExplorer 3. Highlight a feature or waypoint, and press CLOSE. The screen animates and navigates you to the target. For more information see Using the Road tab. **NOTE** Features available in the list are those stored in the open data file. When no data file is open, no features are available in this list.
None	Indicates that no target is selected.

Road option list

NAV / **Road** / OPTION

Press OPTION to view the available options.

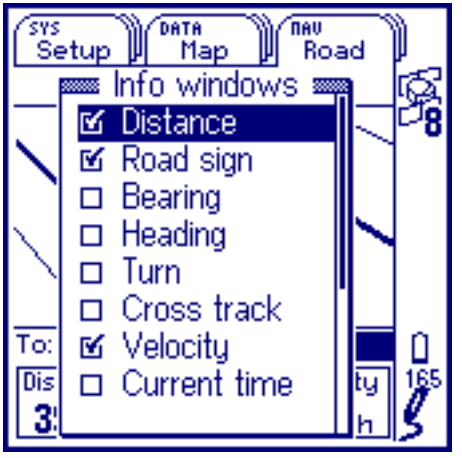


The options are:

- **Info windows**
- **Select target**
- **New waypoint**
- **Edit waypoints**
- **Delete waypoints**
- **Select start**
- **Road scale**

Info windows

To configure the Info windows display at the bottom of a navigation screen, select the Info windows option from the option list (Road, Compass, or Chart). A checklist appears:



The items are:

- **Distance**
- **Road sign**
- **Bearing**
- **Heading**
- **Turn**
- **Cross track**
- **Velocity**
- **Current time**
- **Arrive in**
- **ETA**
- **Coordinates**
- **Altitude**
- **Go N/E**
- **Go up**

When an item is selected there is a ✓ in the check box beside it. To add an item to the display, highlight it, and press ENTER. A ✓ appears in that check box. To remove an item from the display, highlight it, and press ENTER. The ✓ disappears.

NOTE You can display zero, one, two, or three items. To change the items display, first remove those currently selected. If you select no items, no information is displayed at the bottom of the navigation screen. If you select Coordinates or Go N/E, you can only display one other item.

NOTE Not all items in the checklist fit on the screen at one time. Scroll up and down to see them all. **Checklists** scroll in a cyclical fashion.

Checklist item	This item displays ...
Distance	The distance remaining between the current GPS position and the target. This is the shortest **great-circle distance** to the target, computed on your local datum. If no target is selected, the value displayed is N/A.
Road sign	The direction in which you need to turn. If no target is selected, the value displayed is N/A.
Bearing	The **bearing** to the target. This is the angle that you should follow to take the shortest path between the current GPS position and the target. If no target is selected, the value displayed is N/A.

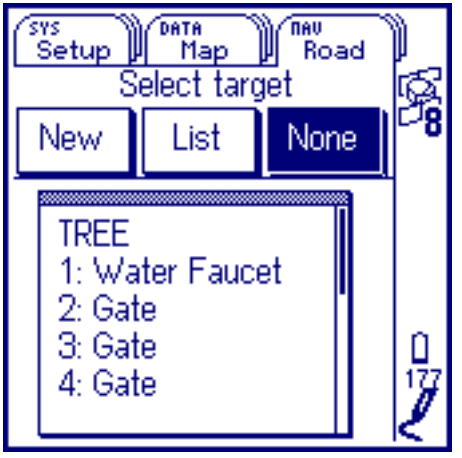
Checklist item	This item displays ...
Heading	The direction in which you are traveling or, if you are stationary, the direction in which you are pointing the GeoExplorer 3 handheld to. When you are stationary GPS cannot give an accurate heading so the internal digital compass is used. Heading can be displayed whether or not a target or start point is selected.
Turn	The difference between the bearing and the heading. The direction you need to turn to face the target. Adjust your heading (left or right) by the amount shown. If no target is selected, the value displayed is N/A.
Cross track	The direction and distance of the shortest line between the start point and the target. The direction (left or right) is indicated by '←' or '→'. The numeric value indicates the distance you need to travel in that direction to get back on track. When you are on track, you are traveling straight towards the target. When you are off track, the person symbol appears some distance from the centerline. The distance away from the centerline (left or right) indicates how far off track you are. Select a start point and target to display the cross track. When no start point or target is selected, the value displayed is N/A.

Checklist item	This item displays ...
Velocity	Your current **velocity**. This value takes into account change in altitude as well as horizontal velocity. The velocity can be displayed whether or not a target or start point is selected.
Current time	The current time configured on the GeoExplorer 3 data collection system. Configure the current time using the **Formats** form. The current time can be displayed whether or not a target or start point is selected.
Arrive in	The time remaining until you reach the target. This value takes your current heading into account and shows a larger value if you are not heading directly towards the target. If no target is selected, the value displayed is N/A.
ETA	The expected time of arrival at the target. This is based on the Arrive in time and the Current time. If no target is selected, the value displayed is N/A.
Coordinates	The current GPS position. The coordinate system that is displayed depends on the configuration. To configure the coordinate system, use the **Coordinates** form. Coordinates can be displayed whether or not a target or start point is selected. When the GeoExplorer 3 is unable to compute GPS positions, the value displayed is N/A.

Checklist item	This item displays ...
Altitude	The altitude between you and the target. If no target is selected, the value displayed is N/A.
Go N/E	The direction to the target as a north and east component. If no target is selected, the value displayed is N/A.
Go up	The vertical distance (up or down) to the target. If no target is selected, the value displayed is N/A.

Select target

To select a target waypoint, choose the Select target option from the option list (Road, Compass, or Chart). The Select target screen appears:



Use this screen to select a feature or a waypoint as your target.

The Select target screen has three buttons:

- **New**
- **List**
- **None**

New waypoint

To create a new waypoint, select the New waypoint option from the option list (Road, Compass, or Chart). The New waypoint form appears:

Use this form to enter new waypoint information. The New waypoint form requires **Text entry** and **Numeric entry**.

Press OPTION to display the Here option. Use the Here option to automatically update the Lat, Lon, and Altitude fields with the current GPS position.

The GeoExplorer 3 automatically generates a name for the new waypoint. When a new waypoint is created using the current GPS position, the prefix for the name is **GPS** and the suffix is a three-digit number (starting at 000 for the first one created). For example, GPS004. When a new waypoint is created using the cursor, the prefix for the name is **Cursor** and the suffix is a three-digit number (starting at 000 for the first one created). For example, Cursor017.

When you have completed data entry, press CLOSE to save the changes.

Press Fn CLOSE to close the form and abandon any changes.

NOTE The GeoExplorer 3 handheld can store 1000 waypoints.

Edit waypoints

To edit a waypoint, select the Edit waypoints option from the option list (Road, Compass, or Chart). An Edit waypoints list appears:

This list shows all waypoints on the GeoExplorer 3 data collection system. Select the one to be edited. The Edit waypoints form appears.

Use this form to edit the waypoint information. The Edit waypoint form requires **Text entry** and **Numeric entry**.

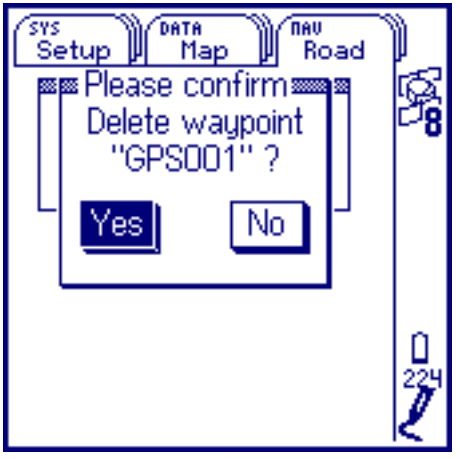
Press OPTION to display the Here option. Use the Here option to automatically update the Lat, Lon, and Altitude fields with the current GPS position.

When you have completed data entry, press CLOSE to save the changes. Press Fn CLOSE to close the form and abandon any changes.

Delete waypoints

To delete a waypoint, select the Delete waypoints option from the options list (Road, Compass, or Chart). A Delete waypoints list appears:

Press OPTION to display the Delete all option. Use the Delete all option to delete all waypoints stored on the GeoExplorer 3.



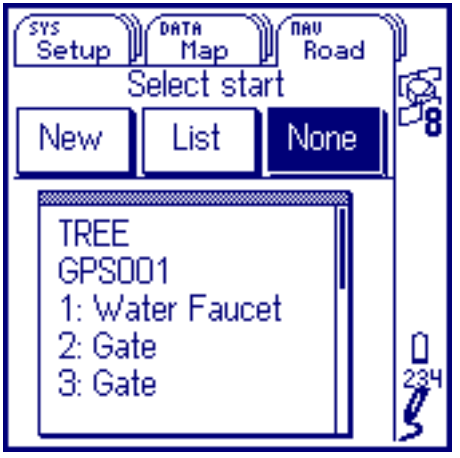
This list shows all waypoints on the GeoExplorer 3 data collection system. Select the one to be deleted. You are prompted to confirm the deletion.

Select Yes to delete the waypoint indicated.

Select No to go back to the Delete waypoints list.

Select start

To select a start point choose the Select start option from the option list (Road, Compass, or Chart). The Select start screen appears:



Use this screen to select the waypoint or feature that you want to start navigating from.

The Select start screen has three buttons:

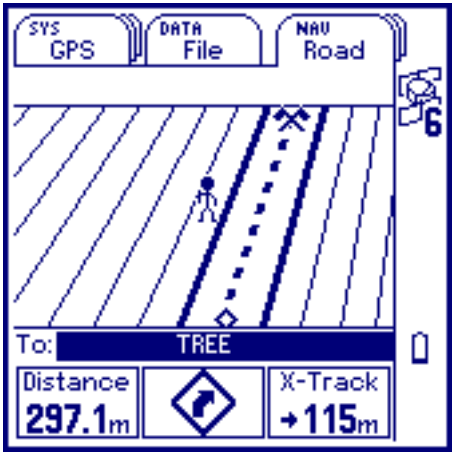
- **New**
- **List**
- **None**

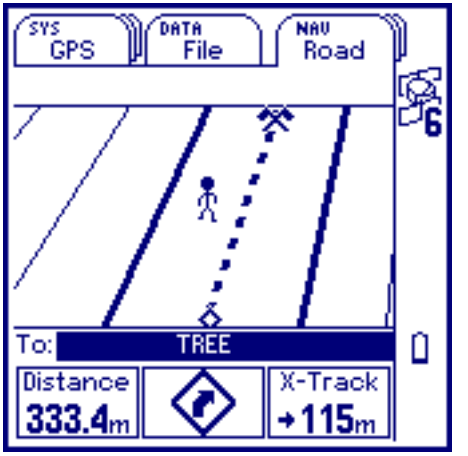
NOTE You do not have to select a start point before navigating to a target. If no start point is specified, some navigational information in the Info windows is displayed as N/A.

Use this button ...	To ...
New	Enter a new waypoint. When you select this button, the **New waypoint** form appears.
List	Select the start point from the list of available waypoints and features on the GeoExplorer 3 handheld. **NOTE** Features available in the list are those stored in the open data file. When no data file is open, no features are available.
None	Indicate that there is no start point.

Road scale

To change the scale of the Road screen that is displayed, choose the Road scale option from the Road option list. Set the road scale according to how accurately you want to follow a path. For example, if you are walking and you want to stay close to the path you are traveling, set a small road scale, for example, 10. If traveling by vehicle in an open field, and staying on track is less important, set a larger road scale, for example, 90.

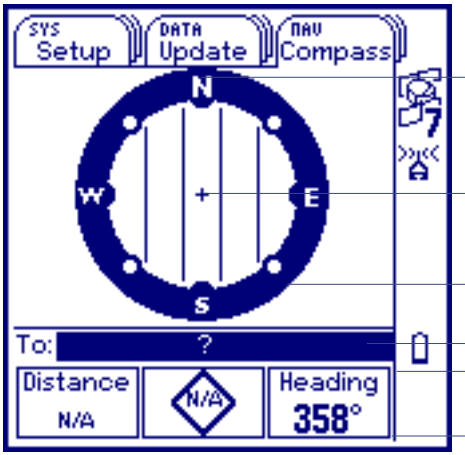




The Compass tab

NAV / Compass

To display the Compass tab, press NAV until the Compass tab is active. The Compass tab appears:



Your heading

Current position

Compass rose

Target name

Info windows

This tab is a combined internal and GPS compass. Use it to orient yourself, and to navigate to a target.

Press OPTION to view the **Compass option list**.

NOTE When you receive your GeoExplorer 3 the internal compass may require **Calibration**.

The Compass screen contains:

- **Your heading**
- **Target name**
- **Current position**
- **Info windows**
- **Compass rose**

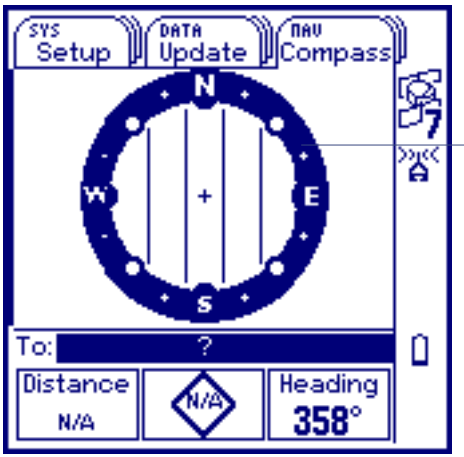
Item	Description
Your heading	The top of the compass indicates your direction or heading.
Current position	The + symbol represents your location relative to the target. Your heading is always straight ahead (towards the top of the screen).
Compass rose	The compass rotates to indicate the direction in which you are heading.
Target name	The target name indicates the name of the target you are navigating to. When no target is selected a ? appears.
Info windows	You can configure the Info windows at the bottom of the screen to provide navigational information. The Info window is only displayed if one or more items are selected. For more information about configuring Info windows see **Compass option list**.

Using the Compass tab

Use the Compass tab to orient yourself and to navigate to targets. The bearings are calculated by a internal compass and GPS information. The GeoExplorer 3 automatically switches between these at a certain **velocity**. This provides an accurate heading at all times, whether you are moving or stationary.

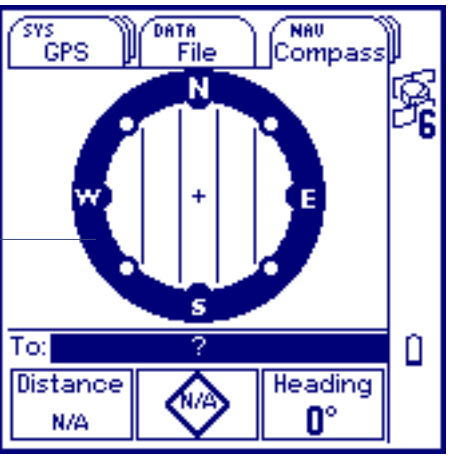
The compass always points towards the configured **North reference**.

The type of compass that is displayed indicates which mode of compass the GeoExplorer 3 is using. The GPS compass is the more detailed one.



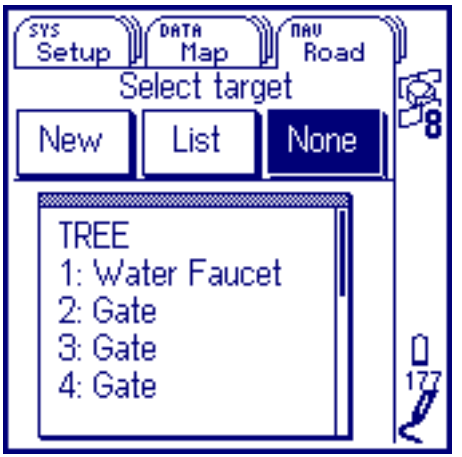
GPS compass

Internal compass



When the internal compass is being used, make sure the GeoExplorer 3 data collector is held level to give an accurate reading. The internal compass has an accuracy of 1 in 8, that is, it can display the eight main compass headings. The GPS compass will accurately display all compass headings.

To navigate to a target, first select a feature or waypoint. To select a target press ENTER. The Select target screen appears:



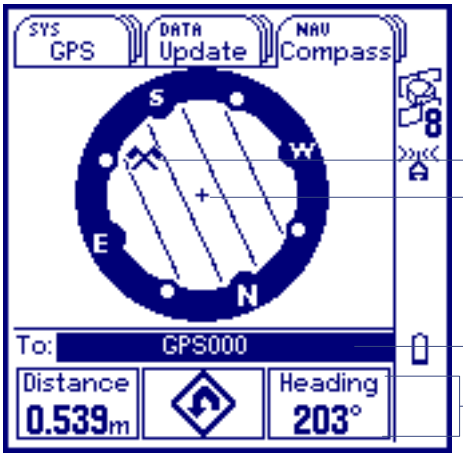
Use this screen to select the target.

The Select target screen has three buttons:

- **New**
- **List**
- **None**

NOTE You can also select a target using the **Compass option list**.

When a target is selected the target symbol appears on the inside of the compass diagram.



Use this screen to navigate to the target.

The **Info windows** at the bottom of the screen, display information that you can use to navigate to the target.

The top of the compass shows your heading. The target that you selected appears as a crossed-flag symbol on the inside of the compass diagram. Its position within the compass diagram indicates the bearing to the target. Use your heading and the bearing to the target to navigate to the target. Navigate by lining up the target symbol, which represents the direction to the target (bearing), with the top of the compass, which represents your current direction (heading).

NOTE By default, the Info window shows Distance, Road sign, and Heading.

To change this, see **Info windows**.

Use this button ...	To ...
New	Enter a new target. When you select this button, the **New waypoint** form appears. Enter the new target information, and press CLOSE. The screen animates and you can use it to navigate to the target.
List	Select the target waypoint from the list of available waypoints and features in the GeoExplorer 3. Highlight a waypoint or feature, and press ENTER. The waypoint or feature becomes the new target. The screen animates and you can navigate to the target. **NOTE** Features available in the list are those stored in the open data file. When no data file is open, no features are available.
None	Indicate that there is no target is selected.

Compass option list

NAV / Compass / OPTION

Press OPTION to display the available options for the Compass screen.

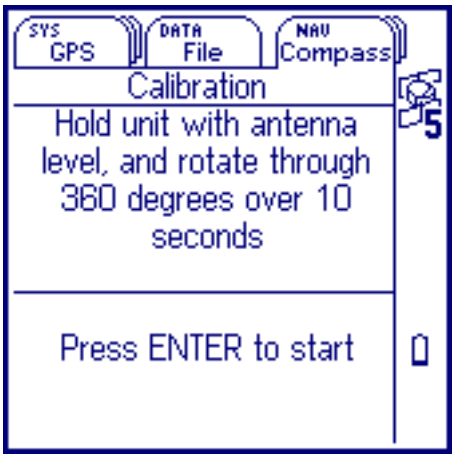
The options are:

- **Info windows**
- **Select target**
- **New waypoint**
- **Edit waypoints**
- **Delete waypoints**
- **Select start**
- **Calibration**

Calibration

Local changes in magnetic fields can effect the accuracy of the GeoExplorer 3 compass at low speeds. In order to take account of local conditions you must calibrate the internal compass. To do this:

1. Highlight calibration in the compass options list and press ENTER. The following screen appears:
2. Follow the instructions and make sure that the antenna of the GeoExplorer 3 is level. The antenna is located in the top portion of the unit under the Trimble logo.
3. Press ENTER, and as the countdown takes place, rotate smoothly through a full circle.



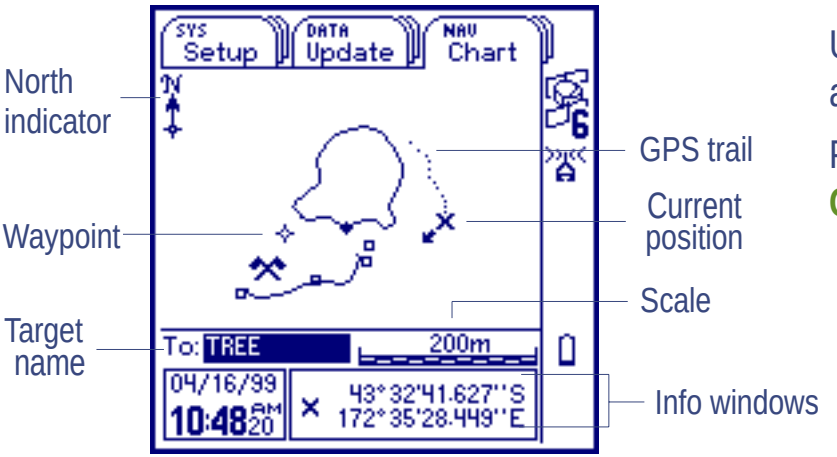
For best results you should finish facing in the direction that you started from. A message will be displayed indicating if calibration is successful.

The Chart tab

NOTE The Chart tab is not available with the GeoExplorer 3c edition.

NAV / Chart

To display the navigation Chart tab, press NAV until the Chart tab is active. The Chart screen appears:



Use this tab to navigate to waypoints and features.

Press OPTION to display the **Chart option list**.

The Chart screen contains:

- **North indicator**
- **Waypoint**
- **Target name**
- **Info windows**
- **Scale**
- **GPS trail**
- **Current position**

NOTE There are two map screens available on the GeoExplorer 3: the DATA Map and the NAV Chart. Use the Map tab, in the DATA section, to view, select, and update features. Use the Chart tab, in the NAV section, to navigate to features and waypoints.

Item	Description
North indicator	The 'N' arrow indicates north.
Waypoint	The waypoint symbol represents the position of the waypoints stored on the GeoExplorer 3.
Target name	The Target name indicates the name of the target you are navigating to. When no target is selected, a ? appears.
Info windows	The Info windows at the bottom of the screen provide navigational information. The default for the Chart tab is Current time and Coordinates. To change the Info windows configuration use the **Chart option list**. The Info window is only displayed if one or more items are selected.
Scale	The scale indicates the scale of the screen. As you zoom in/out the scale changes accordingly.
GPS trail	The GPS trail displays a trail of dots that shows the path you have taken.
Current position	The current position cross indicates your current GPS position. The arrow points to the direction in which you are heading.

Using the Chart tab

Use the Chart tab to navigate to targets (waypoints and features). To activate navigation, select a target.

To select a target, press ENTER. The Select target form appears:

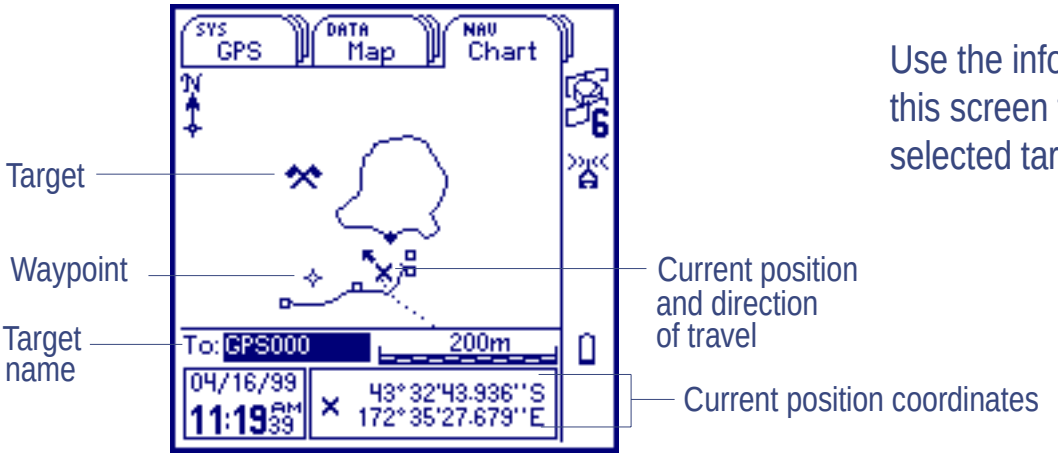
Use this form to select the target that you want to navigate to.

The Select target form has three buttons:

- **New**
- **List**
- **None**

NOTE You can also select a target using the **Chart option list** or a cursor. For more information see **Using the cursor**.

When you select a target, the chart displays information to assist you to navigate to it. The chart graphically displays your current position, your heading, the GPS trail positions, the target, the bearing to the target, and all waypoints on the GeoExplorer 3 data collection system. The Info windows at the bottom of the screen can be configured to display relevant information, or removed completely to increase the chart size. The Chart screen display also indicates the actions required.



Use the information displayed on this screen to navigate to the selected target.

In this example, you are navigating from the current position (the cross and arrow symbol) to target GPS000 (the cross-flag symbol). The direction in which the current position arrow is pointing indicates your current heading.

When the scale is set so that the target is not visible on the screen, a bearing to the target arrow is displayed from your current position, to the target. To navigate to the target, line up your current heading with the bearing to the target. As you get closer to the target, the current position symbol gets closer to the target symbol. You have reached the target when the current position symbol is over the top of the target symbol.

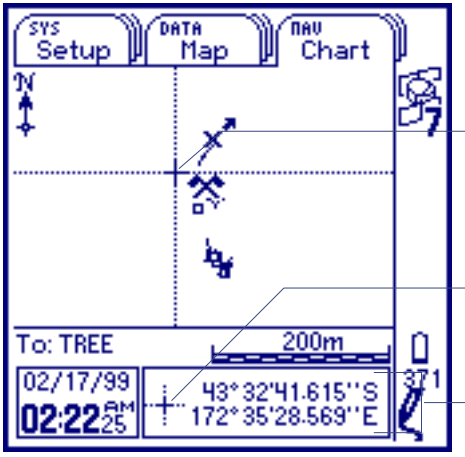
The scale bar at the bottom of the chart screen, indicates the scale of the chart. In the example above, the scale of the screen is 500 m. To change this, press OPTION and select Zoom in, Zoom out, or Zoom extents.

For more information see **Chart option list**.

Using the cursor

Use the cursor to select targets and create new waypoints.

To activate the cursor, press an arrow key. The cursor appears:



The cursor initially appears over the target. If no target is selected, the cursor appears in the center of the screen.

To move the cursor around the screen, press an arrow key. To move the cursor diagonally, press two arrow keys at the same time. When the cursor moves too close to the edge of the chart, the chart automatically pans in the direction of the cursor movement. The cursor remains in the same geographic position.

When the cursor is visible and coordinates are displayed in the Info windows, these coordinates reflect the current cursor position. The symbol to the left of the coordinate indicates whether the coordinates shown are for your current GPS position or the current position of the cursor. In the example above, the symbol to the left of the coordinates is a dotted line cross. It represents the current GPS position of the cursor. An 'X' symbol represents your current GPS position.

NOTE You cannot pan across the screen if the cursor is not visible.

When the cursor is close to a waypoint or feature (if features are displayed), the symbol for that waypoint is highlighted (in reverse video). In addition, the name of the waypoint is displayed beside it. As you move the cursor away from the waypoint, the name and highlight disappear.

To select a target using the cursor, press an arrow key until the waypoint (or feature) is highlighted and the name appears. Press ENTER. The Select target form appears, with the selected waypoint or feature highlighted in the list. Press ENTER to accept the waypoint or feature that is highlighted. It becomes the new target.

To remove the cursor, press CLOSE.

TIP To pan the screen, press Fn and one of the arrow keys. This will pan the map one screen width in the direction of the arrow key you pressed. The cursor remains in the same position on the screen, not in the same geographic position.

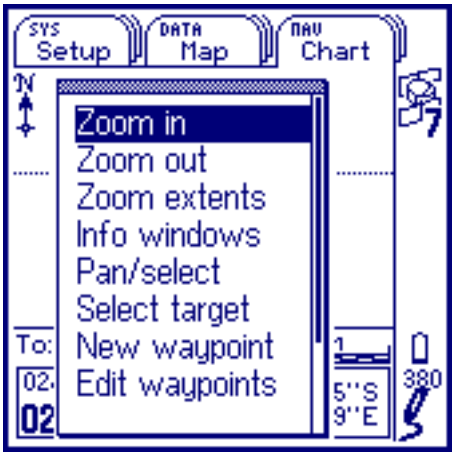
Using the cursor to create a new waypoint

Use the arrow keys to move the cursor to a place on the chart where you want to create a new waypoint. Press ENTER. The Select target form appears. Select the New button. The New waypoint form appears. Use it to enter information about the new waypoint. For more information about the Select target form see **Using the Chart tab**.

Chart option list

NAV / Chart / OPTION

Press OPTION to display the Chart options.



The options are:

- Zoom in
- Zoom out
- Zoom extents
- Info windows
- Pan/select
- Select target
- New waypoint
- Edit waypoints
- Delete waypoints
- Select start
- Layers

Use this option ...	To ...
Zoom in	zoom in to the chart screen. Press OPTION and select Zoom in. This magnifies the display by decreasing the scale. The scale at the bottom of the screen adjusts accordingly. When the cursor is active, the screen zooms in on the cursor. When the cursor is not active, the screen zooms in on the current GPS position.
Zoom out	zoom out of the chart screen. Press OPTION and select Zoom out. This lets you see a greater area by increasing the scale. The scale at the bottom of the screen adjusts accordingly. When the cursor is active, the screen zooms out relative to the cursor. When the cursor is not active, the screen zooms out relative to the current GPS position.
Zoom extents	change the scale so that the chart displays all selected layers. The Zoom extents option varies according to the layers selected and whether the features are filtered. If nothing is displayed on the screen, the Zoom extents option does not affect the chart scale.
Info windows	configure the **Info windows** at the bottom of the screen.

Use this option ...	To ...
Pan/select	activate the on-screen cursor. Use the on-screen cursor to pan the screen in the direction of the cursor movement. You can also use the cursor to select features and waypoints on-screen.
Select target	access the **Select target** screen. Select a waypoint or a feature as the target.
New waypoint	create a **New waypoint**.
Edit waypoints	access the **Edit waypoints** screen.
Delete waypoints	access the **Delete waypoints** list.
Select start	access the **Select start** screen. You can select a waypoint or a feature as the start point.

Use this option ...	To ...
Layers	specify the layers displayed on the chart. Select the Layers option. A checklist appears with the following layers: • Features – Displays the features stored in the open data file. When this is selected, features are displayed on the chart. • Waypoints – Displays the waypoints stored on the GeoExplorer 3. When this is selected, waypoints are displayed on the chart. • GPS trail – Displays a trail of dots which shows the path you have taken. When this is selected, a trail of dots is displayed on the chart. The trail grows to a length of 60 positions. Old positions drop off as new ones are added. • Between feature GPS – Displays a trail of small crosses that show all positions logged between features. • Updated – Displays a ✓ on features that are updated. For line and area features the ✓ appears at the start point. For more information see **The Update tab**. **NOTE** You can only display features in the data file that is currently open. **NOTE** All layers are selected by default except Updated.

Troubleshooting

This section lists potential problems and describes how to solve them. It then lists the messages that can appear on the screen of the GeoExplorer 3 handheld. Each list is arranged in alphabetical order.

- **Potential problems**
- **GeoExplorer 3 messages**

Potential problems

Listed here are problems that you could encounter when using the GeoExplorer 3 data collector. Select one from the list to view its possible causes and solutions.

- Automatically generated Time attributes are incorrect
- Cannot differentially correct the rover GPS positions when postprocessing
- Coordinates displayed by the GeoExplorer 3 appear to be incorrect
- GeoExplorer 3 is not displaying a GPS position within one minute of being turned on
- GeoExplorer 3 is not tracking satellites within three minutes of being turned on
- GeoExplorer 3 will not turn on, or turns off immediately after being turned on
- The GeoExplorer 3 screen is hard to read
- The internal compass does not appear to be working
- The precision of recorded GPS positions is less than was expected
- The real-time differential correction link is not working
- You are having problems using Beacon-on-a-Belt (BoB) receiver with the GeoExplorer 3

Automatically generated Time attributes are incorrect

Possible cause	Fix
The internal clock of the GeoExplorer 3 is set incorrectly.	Reset it by adjusting the Time zone field (in the **Formats** configuration menu). **NOTE** Automatically generated file names are derived from UTC time, not local time.
The GeoExplorer 3 has not received GPS time yet.	Take the GeoExplorer 3 outside and check that it can track at least one satellite. If not, see **GeoExplorer 3 is not tracking satellites within three minutes of being turned on**.

Cannot differentially correct the rover GPS positions when postprocessing

Possible cause	Fix
The rover unit used satellites that were not visible to the base station.	In future make sure that the **Elevation mask** on the rover is set high enough. The rover must only use satellites that are also visible to the **Base station**.
The Base station file started too late or too soon.	Check to see if there are other Base files collected adjacent to your current base file. or Check to see if you can use Base station data from another provider. or In future, make sure the Base file is started before the rover is started, and stopped after the rover file has been closed.

Coordinates displayed by the GeoExplorer 3 appear to be incorrect

Possible cause	Fix
You are using the Latitude/ Longitude coordinate system and have selected the wrong **datum**.	Check **Coordinates** and make sure that the correct datum is selected.
You are using the UTM coordinate system and have selected the wrong UTM zone or datum.	Check Coordinates and specify the correct zone and datum. **NOTE** Two datums are commonly used in the USA: **NAD-27** and **NAD-83**.
You have selected the wrong coordinate system, zone, or coordinate units.	Check Coordinates and specify the correct coordinate system, zone, and coordinate units. For more information see **Coordinate systems**.

Possible cause	Fix
You have defined a custom coordinate system, datum, and/or zone incorrectly using the Coordinate System Manager in the Pathfinder Office software.	Check the definition of the coordinate system, datum, and/or zone carefully. Make sure that values such as the scale factor are specified correctly (as a parts-per-million value), that rotations are specified in the correct sense (a positive rotation is counter-clockwise), and that Latitudes and Longitudes are specified in the correct hemisphere (North/South or East/West, respectively).

GeoExplorer 3 is not displaying a GPS position within one minute of being turned on

Possible cause	Fix
Not enough satellites are available. A minimum of four is required to compute GPS positions.	Use mission planning to check that there are sufficient satellites at this time. or Use the **GPS** slider bar to adjust the configured GPS precision.
The current PDOP value is too high. (The geometry of the satellite constellation is poor)	Use mission planning to check that the current PDOP value is below the configured mask. or Use the GPS slider bar to adjust the configured GPS precision.
There is no real-time link.	Use the **Real-time** form to check if the Mode field is configured for RTCM only. When the GeoExplorer 3 is configured for RTCM only and there is no real-time link, no GPS positions are displayed or recorded.

GeoExplorer 3 is not tracking satellites within three minutes of being turned on

Possible cause	Fix
Satellites are being obstructed.	Identify the obstruction and move away from it. The obstruction may be a building, tree, or vehicle. **NOTE** GPS does not work indoors.
The external antenna (or antenna cable) has not been connected, has been connected incorrectly, or is faulty.	Check **The Status tab** or **Status bar** to make sure that the external antenna is connected and working properly. If the GeoExplorer 3 still fails to track signals, the antenna and/or antenna cable may need to be serviced. **NOTE** If the external antenna is not working properly GeoExplorer 3 reverts to the internal antenna.

Possible cause	Fix
The almanac is too old. The GeoExplorer 3 has not recorded and stored a current almanac.	Wait (for up to 15 minutes) until the GeoExplorer 3 records an **Almanac**.

GeoExplorer 3 will not turn on, or turns off immediately after being turned on

Possible cause	Fix
The internal power source is not charged.	Recharge the internal power source or use an external power source.
The GeoExplorer 3 firmware has locked up and is not responding to any keys.	Perform a **Warm boot** of the system.

The GeoExplorer 3 screen is hard to read

Possible cause	Fix
The screen has been left in direct sunlight.	Remove the handheld from direct sunlight and wait until the screen returns to normal.
The GeoExplorer 3 internal power source is low.	Check the internal power level. Use the **The Status tab** or the **Status bar**. If the internal power is low, recharge the battery or use an external power source with the GeoExplorer 3 handheld.
The screen display contrast needs adjusting.	Adjust the **Screen contrast**.
The screen backlight needs adjusting	Adjust the **Backlight** brightness.

The internal compass does not appear to be working

Possible cause	Fix
The compass has not been calibrated, or needs to be re-calibrated.	Use the **Calibration** option from the **Compass option list** to calibrate the compass.
The GeoExplorer 3 is not being held in a level position.	The GeoExplorer 3 needs to be held level for the compass to display accurate readings.

The precision of recorded GPS positions is less than was expected

Possible cause	Fix
You did not record sufficient positions to achieve the required precision (for a point feature).	Use **Feature settings** to increase the minimum number of positions required (for a point feature).
You are operating in an area of high **multipath** interference.	Move away from obstructions, such as buildings, and use **Offsets** to record features.
The GPS slider bar is set too low.	Adjust the **GPS** slider bar.
The PDOP mask is too high.	Lower the **PDOP mask** or move the GPS slider to the right.
The SNR mask and/or Elevation mask is too low.	Increase the **SNR mask** and/or **Elevation mask** or move the GPS slider to the right.

Possible cause	Fix
The GeoExplorer 3 is configured to use a minimum of three satellites and the 2D altitude specified is not accurate.	Change the **2D altitude**.

The real-time differential correction link is not working

Possible cause	Fix
The RTCM connection is not connected, has been connected incorrectly, or is faulty.	Use **The Status tab** or the **Status bar** to check if real-time corrections are being received. Make sure that the cable is connected properly.
The RTCM communication parameters are configured incorrectly.	Use the **COMMS** form to change the RTCM parameters. Consult the documentation for your radio for the correct parameters.
The Station ID is incorrect.	Change the **Station ID** setting.
The GeoExplorer 3 is not receiving corrections from the BoB receiver via the cable-free link.	In the COMMS form make sure the RTCM input field is set to Cable-free BoB. Also, check that the BoB receiver has been enabled for cable-free transmission. For more information refer to the Beacon-on-a-Belt (BoB) Receiver Manual.

You are having problems using Beacon-on-a-Belt (BoB) receiver with the GeoExplorer 3

Possible cause	Fix
The BoB receiver is set to the wrong frequency.	Use the BoB receiver to change the frequency being used to receive real-time corrections.
The BoB receiver is too far away when operating using the cable-free link.	Move the GeoExplorer 3 closer to the BoB receiver.

NOTE There may be other reasons why you are having problems using the BoB receiver with the GeoExplorer 3.

For more information refer to the troubleshooting section in the Beacon-on-a-Belt (BoB) Receiver Manual.

GeoExplorer 3 messages

This section lists error, confirmation, and information messages that can be displayed by the GeoExplorer 3 data collection system. The cause(s) of each message is(are) described and, where relevant, suggestions are made how you should proceed.

- **Error!**
- **Please confirm...**
- **Other messages**

Error!

Cannot change mode with custom settings

You are in the custom mode of the GPS slider bar and you try to change the mode. You cannot view the Standard mode of the **GPS** slider bar if you are in Custom mode. To change mode, use the arrow keys to highlight the slider bar. Then press OPTION and select Standard.

Cannot exceed 1000 waypoints

You attempted to create a waypoint when the limit of 1000 waypoints stored on the GeoExplorer 3 has been reached. You can delete unnecessary waypoints using the option list in the **The Road tab**, **The Compass tab**, or **The Chart tab**. If you want to save any waypoints first, you can transfer them to your office computer.

Compass calibration cannot proceed if a data file is open or data transfer is occurring

You are attempting to calibrate the internal compass while a data file is open or data transfer is occurring. Close any open data files and wait until data transfer is completed, then attempt the calibration.

<Dictionary file name> is in use and cannot be deleted

If a data dictionary cannot be deleted because a data file on the GeoExplorer 3 uses it. Delete the data file before deleting the dictionary.

Data dictionary currently in use

You have tried to open a file using a data dictionary that is currently open for edit in **The Setup tab**. To open a file using this dictionary you must first complete any changes, then close the dictionary, before proceeding to open your file.

Data dictionary too large to edit

You have tried to open a data dictionary that requires more memory than is available on the GeoExplorer 3. To edit the data dictionary use the Data Dictionary Editor in the Utilities menu of Pathfinder Office. For more information on using the Data Dictionary Editor refer to the Pathfinder Office online Help.

Duplicate file names are not allowed

You have attempted to give a file the same name as an existing file. All file names and identifiers on the GeoExplorer 3 must have a unique name. Case (upper or lower) is ***not*** significant when comparing two names.

<field>: out of range “min” to “max”

The number entered is too large or too small. Enter a number within the specified range.

<field/attribute name>: Entry required

You are editing a field or attribute that requires a value, but have not entered a value.

Failed to load configuration file

The transfer of a configuration file to the office computer was unsuccessful. Make sure that the configuration file is valid and it contains no errors, and that there is enough memory on GeoExplorer 3.

Failed to load coordinate system

The transfer of a coordinate system file from the office computer was unsuccessful. Make sure that the coordinate system file is valid and contains no errors, and that there is enough memory on the GeoExplorer 3.

File in use by data transfer

You have attempted to open or delete a file that is currently being transferred to your office computer or is being overwritten by an transfer from your office computer. Either cancel the data transfer from your office computer or wait until transfer is complete before opening/deleting the data file.

Inappropriate location for map projection

You have entered a coordinate (North/East) that is outside the bounds of the configured coordinate system zone. Use **Coordinates** to check that you have selected the appropriate coordinate system and zone. Make sure that you have entered the coordinate correctly (pay particular attention to the hemisphere—N, S, E, or W). If using a custom coordinate system and/or zone, make sure that you defined the coordinate system, **datum**, and/or zone correctly.

Invalid date

The date entered is invalid. Make sure that you entered the date in the correct format as configured in **Formats**.

Invalid time

The time entered is invalid. Make sure that you entered the time in the correct format as configured in **Formats**. You can enter time in either the 12 or 24 hour format. If using the 12 hour clock, remember to specify pm if the time is after midday.

Memory nearly full

This warning message appears if you try to create or open a file when less than 10 KB of data storage space remains. Use **The Status tab** to see how much memory is left. To create memory space, use **The File tab** to delete data files.

<number>: Floating point number too large

The numeric value entered in a field is too large to be stored or displayed on the GeoExplorer 3.

The GeoExplorer 3 can store and display large numeric values. If this message appears, you have probably entered a wrong value or coordinate in the wrong coordinate system.

Please charge the internal battery before upgrading

You are attempting to upgrade the firmware while the unit has a low power supply. To proceed with the upgrade place the unit in the support module with the power connected. The upgrade can take place when the power level has reached 10%.

Start time is later than end time

This message appears when the GeoExplorer 3 is filtering features based on logging time, and the specified End time is not later than the Start time. Enter correct Start and End times.

Too many info windows selected

You have checked more Info window options than can be displayed. Typically three windows can be displayed at once. However, if Coordinates or Go N/E are checked you can only display one other Info window. Uncheck the excess Info windows before closing the list.

Unable to append to a file over one week old

You attempted to log data to a file created more than one week ago. Create a new data file to collect data.

Unable to go to standby mode if a data file is open

You have attempted to place the unit in standby mode while a data file is open. Before entering standby mode all data files must first be closed. Use the CLOSE key in the Data section to close any open features and then the file itself. Press ⏻, once the file is closed, to place the GeoExplorer 3 in standby mode.

Warning! Position is out of the current coordinate system boundaries

You attempted to enter or display a geographic position outside the boundaries of the current coordinate system. Use **Coordinates** to see if you selected the appropriate coordinate system and zone. Make sure that you entered the coordinate correctly. Pay particular attention to the hemisphere—N, S, E, or W. If using a custom coordinate system and/or zone, make sure that you have defined the coordinate system, datum, and/or zone correctly.

This message is most likely to appear when you use a coordinate system transferred from the Pathfinder Office software, as the default Lat/Long and UTM coordinate systems have a global scope.

For more information refer to the Pathfinder Office online Help.

You have entered an incorrect password. Operation not allowed.

The field you have tried to change has been password locked by the office software. The password you have entered is incorrect. If you have forgotten the password check the password settings for your Configuration file in Configuration Manager.

Zoom limit reached

You have reached the maximum or minimum zoom magnification that can be displayed by the map or chart.

Please confirm...

Abandon changes?

Select Yes to discard any changes made to the open attribute or form. Select No to cancel the operation and return to the form without losing your changes.

Close rover file?

Select Yes to close and save the rover file you currently have open. Select No to cancel the close and continue with the file open.

Close file and reset to factory defaults?

Select Yes to reset the GeoExplorer 3 data collection system to factory default values. Select No to cancel the operation.

GeoExplorer 3 cannot be reset to factory defaults if a data file (base or rover) is open. If you select Yes, GeoExplorer 3 will close the file first and then reset the values.

Delete all?

Select Yes to delete all waypoints that are stored on the GeoExplorer 3. Select No to cancel the operation.

Delete all files?

Select Yes to delete all data files (rover and base) that are stored on the GeoExplorer 3. Select No to cancel the operation.

Delete attribute <attribute name>?

Select Yes to delete the selected attribute. Select No to cancel the operation.

Delete base file <filename>?

Select Yes to delete the selected base file. Select No to cancel the operation.

Delete dictionary <dictionary filename>?

Select Yes to delete the selected data dictionary. Select No to cancel the operation.

Delete feature <feature name>?

Select Yes to delete the selected feature. Select No to cancel the operation.

Delete geoid?

Select Yes to delete the specified geoid. Select No to cancel the operation.

Delete rover file <filename>?

Select Yes to delete the selected Rover file. Select No to cancel the operation.

Delete value <value name>?

Select Yes to delete the selected value. Select No to cancel the operation.

Delete waypoint <waypoint name>?

Select Yes to delete the selected waypoint. Select No to cancel the operation.

Distance to feature exceeds warning distance: Replace GPS data anyway?

You are updating the GPS position of a feature and your current position is further than the configured **Warning distance** from the feature's previously recorded position. Select Yes to overwrite the previous position with the current GPS position. Select No to cancel the operation.

Enter upgrade mode? (Firmware upgrade will delete all data files)

Select Yes to enter upgrade mode. The GeoExplorer 3 must be in upgrade mode for installation of different firmware versions using the WinFlash software. Installing new firmware will delete all files on the GeoExplorer 3. Select No to abandon the firmware upgrade and return to **The Setup tab**.

File <filename> has not been transferred to the PC: Delete anyway?

The selected data file has not been transferred to the office computer. If you delete it from the GeoExplorer 3, it will not be recoverable. Select Yes to delete the selected file. Select No to cancel the operation.

Insufficient carrier: Close anyway?

You have attempted to close a data file that is logging carrier phase data, and the amount of data required (10 minutes) has not been collected. Select Yes to close the file. Select No to continue collecting carrier-phase data.

Insufficient GPS positions: Do you want to store this feature now?

You have attempted to close the current point feature before the GeoExplorer 3 could record the configured **Minimum positions**. Select Yes to store the point feature anyway. Select No to continue collecting positions for the selected feature.

Reset coordinate systems?

Select Yes to remove all coordinates loaded on GeoExplorer 3, except Latitude/Longitude and UTM. Select No to cancel the operation.

Stop base station?

Select Yes to stop logging base station data and close the base file. Select No to continue logging data.

Update GPS data in feature <feature name>?

Select Yes to replace the previous GPS position with the current GPS position. Select No to cancel the operation.

Other messages

Calibration failed, Try again?

Select Yes to attempt calibration again. Select No to return to the compass screen without calibrating the compass.

Calibrate digital compass

The internal compass requires calibration to return an accurate heading under local conditions. To calibrate the compass select Calibration from the Compass options list. The internal compass effects the use of the Skyplot, Road, Chart, and Compass screens at low velocities. For more information see **Using the Compass tab**.

Calibration successful

You have successfully calibrated the compass. Press ENTER to close the message. For more information see Using the Compass tab.

Fn + OPTION to display the main menu

For an overview of the GeoExplorer 3 system, access the main menu using this combination of keys.

OLD position

This message flashes over the GPS position if no current GPS position is available. (This occurs, for example, if there are too few satellites or the geometry is poor.)

Please wait... Filtering

The GeoExplorer 3 is filtering the features according to the specified parameters.

Please wait... Processing

The GeoExplorer 3 has a large amount of processing to do and further operation is suspended until the current task is completed. Pressing Fn CLOSE cancels the current task.

Please wait... Rebuilding file

The GeoExplorer 3 is checking and repairing files. These files were not closed properly because of a sudden power failure or similar event.

Please wait... Sorting

GeoExplorer 3 is sorting the features according to the specified parameters.

Poor geometry

The current satellite geometry does not meet the precision configured on the **GPS** slider bar.

The current **PDOP** is higher than the configured **PDOP mask**.

Some files have not been transferred to the PC: Continue?

Select Yes to continue with the firmware upgrade. All data files on the GeoExplorer 3 will be permanently deleted. Select No if you want to abandon the firmware upgrade. You may transfer the necessary files and then upgrade your firmware.

Too few satellites

The number of satellites being tracked does not meet the precision configured on the **GPS** slider bar.

There are too few satellites with an **SNR** value that is higher than the configured **SNR mask**.

Undefined GPS error

The GeoExplorer 3 is not tracking satellites for an unknown reason. If this message persists please contact your Trimble dealer to have the GPS equipment serviced.

Upgrading firmware from WinFlash (Hold down power key to abort)

The GeoExplorer 3 is now able to communicate with Winflash. If you have not done so already, connect the GeoExplorer 3 to your office computer and run WinFlash to upgrade the firmware to a different version. If you want to abandon the upgrade hold down the power key  for approximately 10 seconds. Restart using the power key  .

Validating

The GeoExplorer 3 is validating the attribute values that have been entered for the current feature.

This message also appears if you change fields in a configuration form and then press CLOSE.

Installing the firmware

If you have received the complete GeoExplorer 3 or GeoExplorer 3c data collection system, then it already contains the GeoExplorer 3 firmware. In this case, you can disregard this chapter.

Please read and follow these instructions carefully, if you need to:

- change your GeoExplorer 3c firmware to the GeoExplorer 3 firmware or vice versa
- update the GeoExplorer 3 or GeoExplorer 3c firmware
- install or reinstall the GeoExplorer 3 or GeoExplorer 3c firmware

These instructions cover:

- **Equipment required for installation**
- **Changing to a different edition of the GeoExplorer 3 firmware**
- **Installing the GeoExplorer 3 or GeoExplorer 3c firmware**

Equipment required for installation

For the upgrades and installation to proceed, the WinFlash software, which is used to install the GeoExplorer 3 firmware onto your GeoExplorer 3 data collector, must be installed on your office computer. It is available, along with the GeoExplorer 3 firmware, from the World Wide Web (http://www.trimble.com). If you do not have access to the World Wide Web, contact your local Trimble dealer to receive the GeoExplorer 3 installation disks.

To use the WinFlash software with the GeoExplorer 3 data collector you need the following equipment:

- an IBM-compatible personal computer running Windows 95, Windows 98, or Windows NT, with at least one available serial RS232 port and at least 10 MB of free hard disk space.
- your GeoExplorer 3 data collector
- a 9-pin to 25-pin converter (this is only required if your computer has a 25-pin serial port connector on its COM1: or COM2: ports)
- a Trimble GeoExplorer 3 Support Module

  This is used to provide an external source of power for the installation process, rather than using the internal battery of the GeoExplorer 3. Alternatively, you can upgrade the firmware using the GeoExplorer 3 serial clip, however, you should make sure that the internal battery is at least 50% charged.

- CD-ROM drive (if you do not have access to the World Wide Web)

CAUTION It is crucial that you have all of the equipment listed above ***before*** you start to perform the option upgrade or to install the firmware. ***Do not*** attempt to substitute other equipment. By using the recommended equipment and following the instructions provided in this section you will be able to quickly and reliably perform the process. If you use inappropriate equipment, or fail to follow the instructions, it is likely that you will be unable to install the firmware or upgrade the options successfully. In addition, the risk of erasing the current firmware in your GeoExplorer 3 without replacing it, is greatly increased. If this occurs, you will need to return your GeoExplorer 3 to Trimble for servicing.

Although the GeoExplorer 3 firmware installation and option upgrade can be accomplished by using power from the internal lithium battery of the GeoExplorer 3, it is recommended that you use the Trimble GeoExplorer 3 Support Module as an external source of power. This prevents accidental termination of the installation process while running off a discharged battery.

Before you start the installation process, make sure that you have transferred any data files and waypoints to your office computer. If you do not, these files will be deleted.

Changing to a different edition of the GeoExplorer 3 firmware

Before you load a different edition of the firmware (GeoExplorer 3 or GeoExplorer 3c) onto the data collector, the GeoExplorer 3 data collector must be ‘enabled’. To enable the GeoExplorer 3 data collector to install either edition requires an option upgrade.

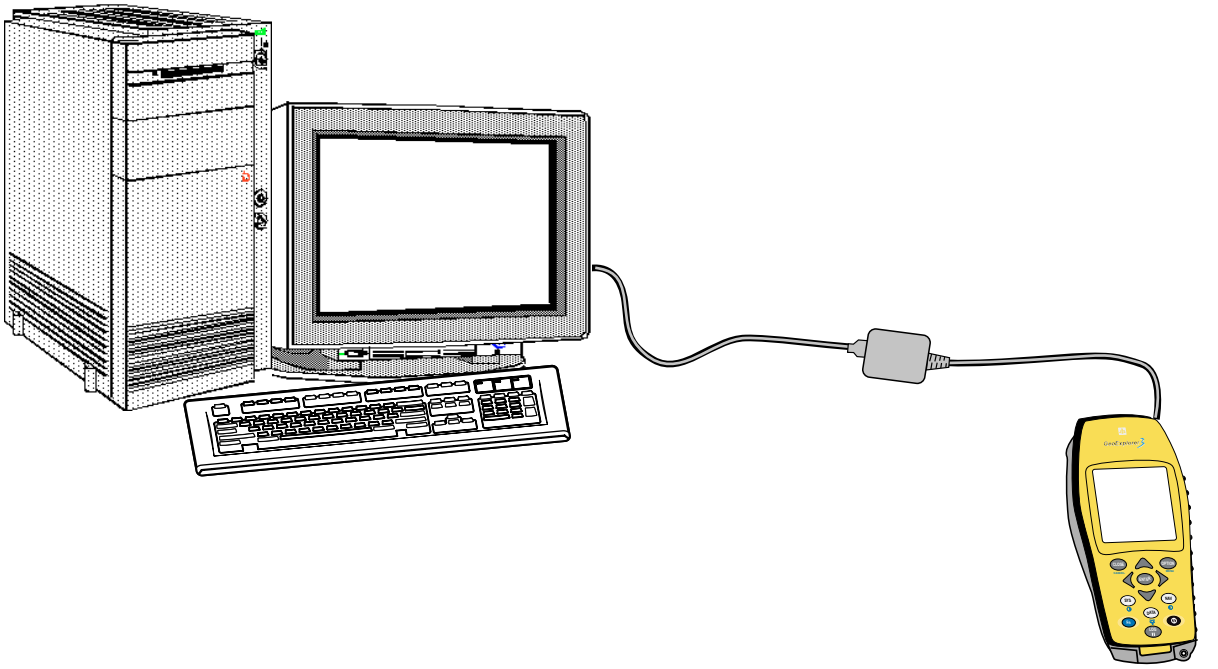
The option upgrade program simply changes internal settings on the data collector. Once the internal settings have been changed, you then need to install the new firmware edition.

To perform an option install using the GeoExplorer 3 Support Module as an external power source

To perform an option install using the internal lithium battery of the GeoExplorer 3 as the power source

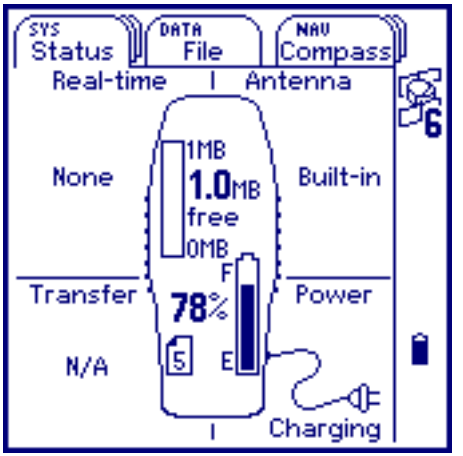
To perform an option install using the GeoExplorer 3 Support Module as an external power source:

1. Connect the equipment listed in **Equipment required for installation**:



2. Plug the GeoExplorer 3 Support Module into the wall current (mains).

3. Connect the GeoExplorer 3 Support Module to the COM1 or COM2 serial port of your computer using the supplied null modem cable (part number 18532).
4. Place your GeoExplorer 3 data collector into the GeoExplorer 3 Support Module.
5. Turn on the GeoExplorer 3 and office computer, if they are not already on. Check the Status screen on the GeoExplorer 3 to make sure the unit is being powered externally:

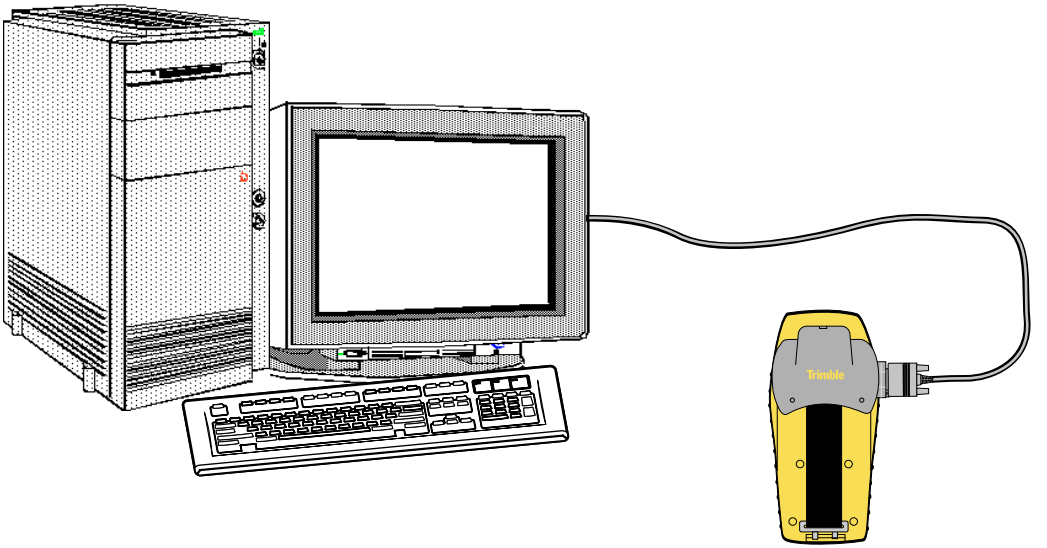


You are now ready to option upgrade the firmware.

See **To proceed with the option upgrade**.

To perform an option install using the internal lithium battery of the GeoExplorer 3 as the power source:

1. Connect the serial clip (part number 38595-00) to swipes on the rear of the GeoExplorer 3 data collector.



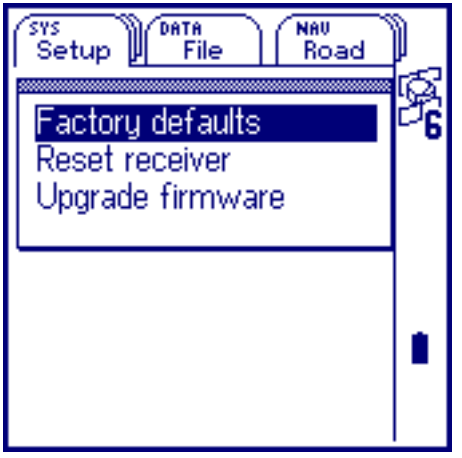
2. Connect one end of the null modem cable (part number 18532) to the serial clip. Connect the other end of the null modem cable to the COM1 or COM2 serial port of your computer.

You are now ready to option upgrade the firmware.

See **To proceed with the option upgrade**.

To proceed with the option upgrade

1. Turn on the GeoExplorer 3. Go to the Setup tab and select **Reset**. The following menu appears:



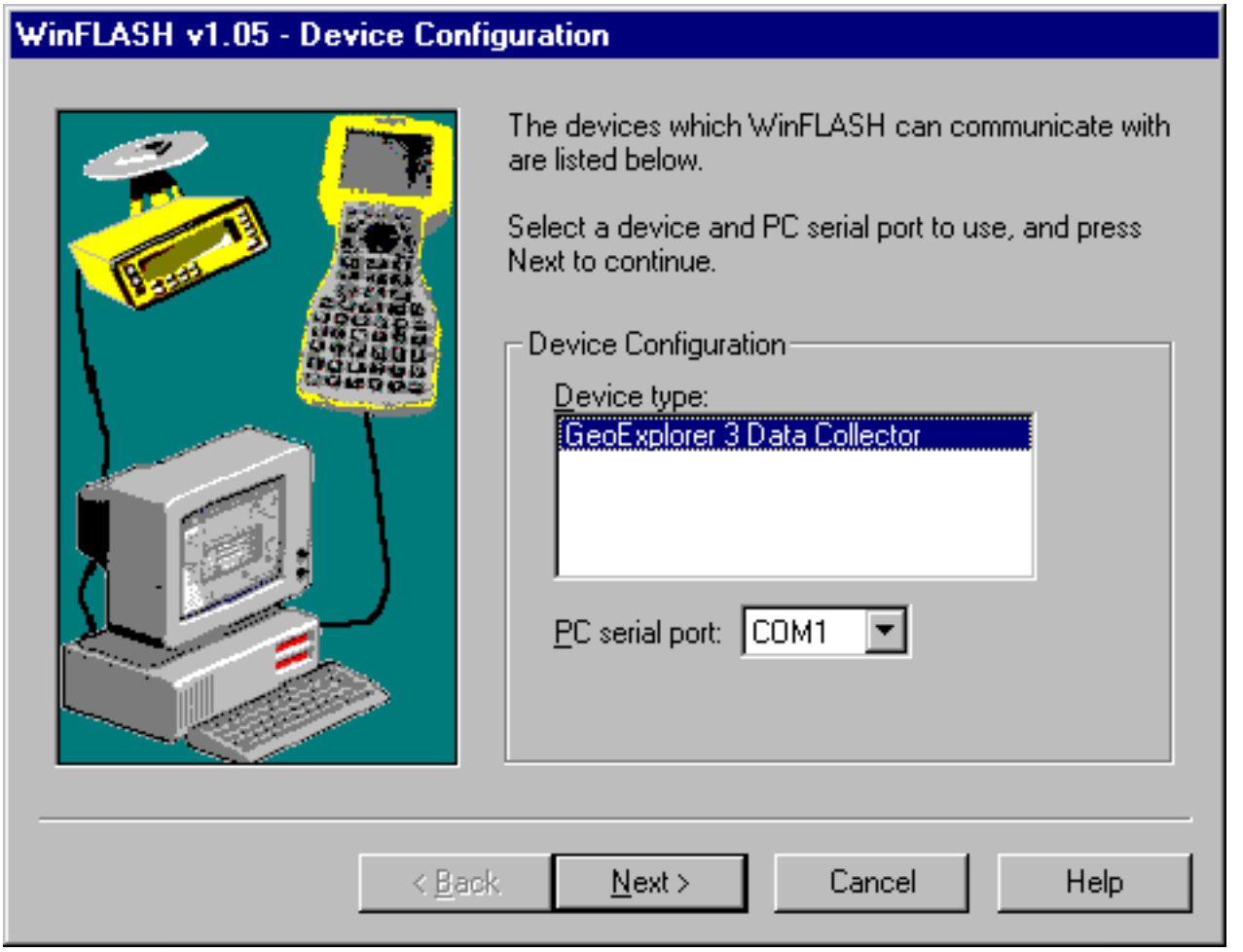
2. Select Upgrade firmware. You will be asked to confirm this action. You can begin the option upgrade when the following screen appears:

3. Turn to your office computer.

   For the firmware upgrade to proceed, the WinFlash program, which is used to install the GeoExplorer 3 firmware onto your GeoExplorer 3 data collector, must be installed on your office computer, along with the GeoExplorer 3 firmware you want to install. The WinFlash program and GeoExplorer 3 firmware can be installed from the World Wide Web or from the installation disk (if you do not have Internet access).

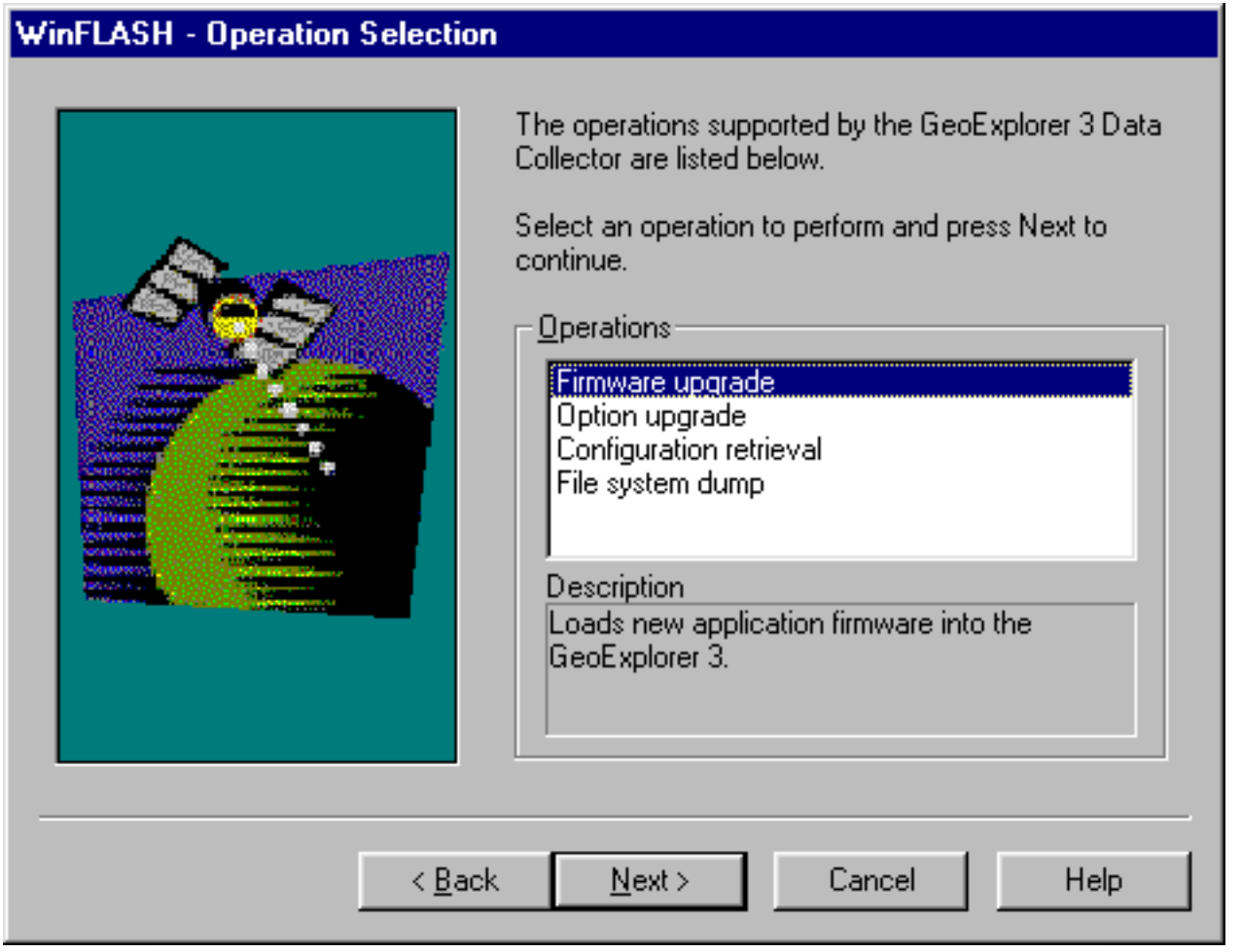
4. Start the WinFlash software. To do this, from the Windows Start menu select Programs / WinFlash / WinFlash.

A dialog similar to the following appears:



5. Select the GeoExplorer 3 data collector as the device type and specify the personal computer serial port that your GeoExplorer 3 is connected to.
6. Click **Next**.

The Operation Selection dialog appears:



7. Select the Option upgrade option and click **Next**.

The following dialog appears:

8. At this point, the WinFlash software asks you to enter your option password. Enter the password exactly (including matching case) as provided by Trimble and click **Next**.

   The program initiates communication with the GeoExplorer 3 and the option installation completes automatically.

WARNING Do not stop the option upgrade process on the computer or on the GeoExplorer 3 once it has started. Doing so may corrupt the firmware. If this occurs, you may need to return your GeoExplorer 3 to Trimble for servicing.

You are now ready to install the firmware.

See **Installing the GeoExplorer 3 or GeoExplorer 3c firmware**.

Installing the GeoExplorer 3 or GeoExplorer 3c firmware

This section describes installing the GeoExplorer 3 firmware onto the GeoExplorer 3 data collector. The instructions are identical those for the GeoExplorer 3c edition.

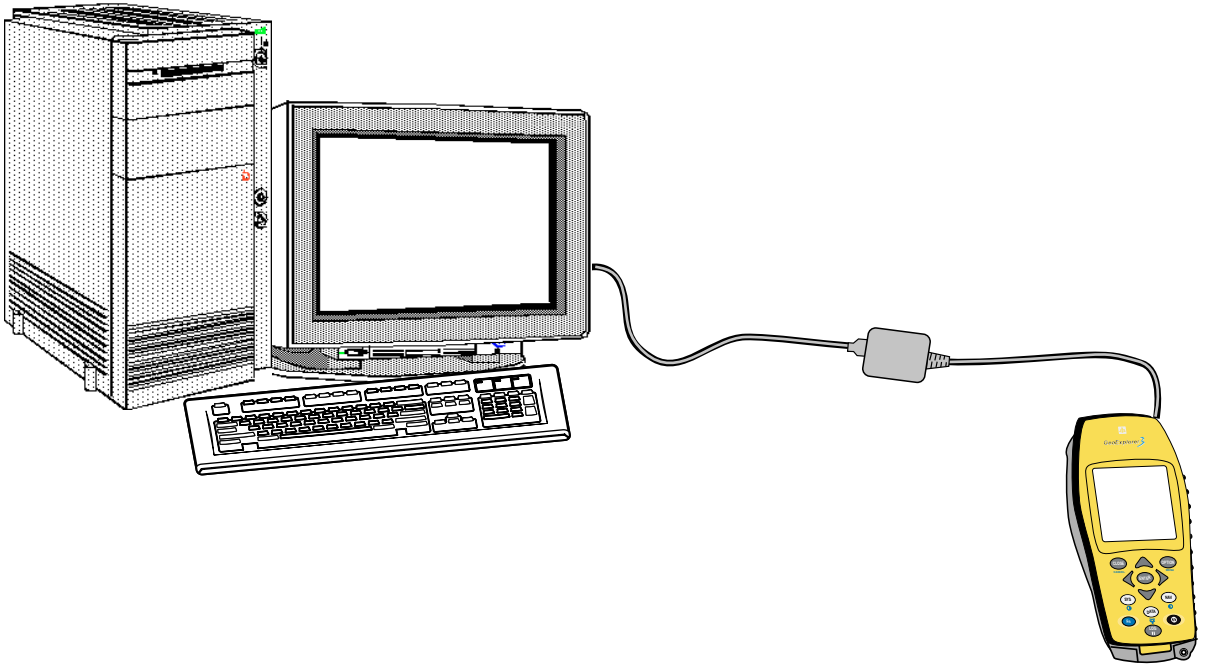
If you are installing an edition of the GeoExplorer 3 firmware not previously installed, you must upgrade the GeoExplorer 3 option onto the data collector as described in **Changing to a different edition of the GeoExplorer 3 firmware**. When you have completed the option upgrade, you can proceed with the GeoExplorer 3 firmware installation.

The following instructions enable you to install the GeoExplorer 3 firmware onto the GeoExplorer 3 data collector.

CAUTION The firmware installation process completely erases the contents of the GeoExplorer 3's memory. Make sure that all data files and waypoints are transferred to your computer before installing the firmware.

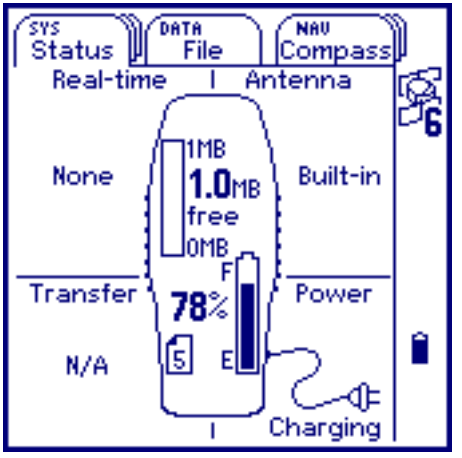
To install the GeoExplorer 3 firmware using the GeoExplorer 3 Support Module as an external source of power:

1. Connect the equipment listed in **Equipment required for installation**:



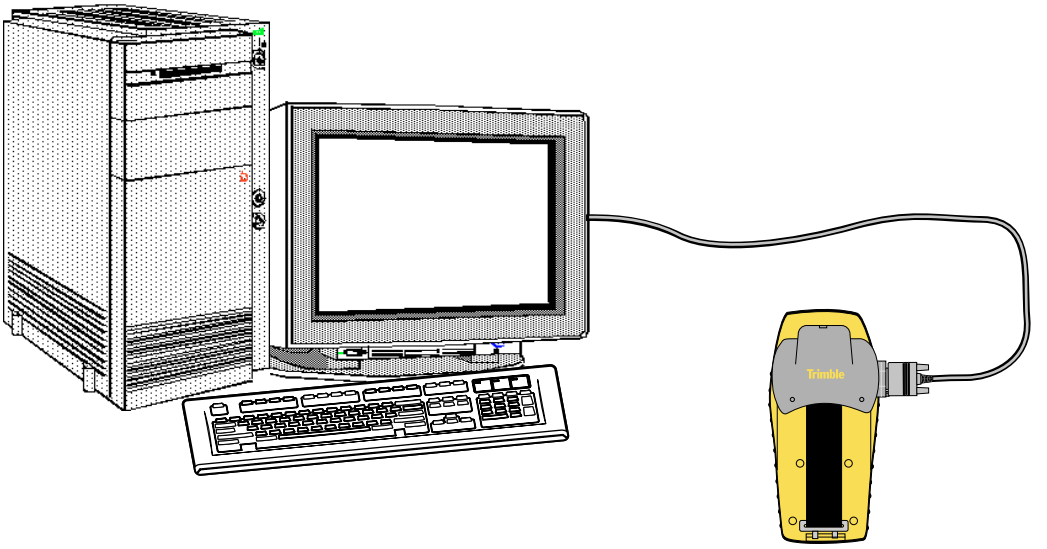
2. Plug the GeoExplorer 3 Support Module in to the wall current (mains).

3. Connect the GeoExplorer 3 Support Module to the COM1 or COM2 serial port of the computer using the supplied null modem cable (part number 18532).
4. Place your GeoExplorer 3 data collector into the GeoExplorer 3 Support Module.
5. Turn on the GeoExplorer 3 and computer, if they are not already on. Check the Status screen on the GeoExplorer 3 to make sure the unit is being powered externally:



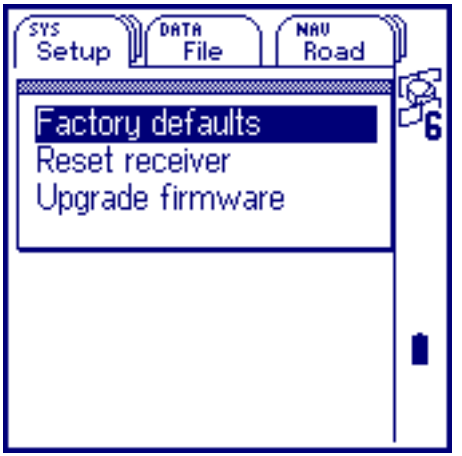
To install the GeoExplorer 3 firmware using the internal lithium battery of the GeoExplorer 3 as the power source:

1. Connect the equipment listed in **Equipment required for installation** as shown in the following diagram:

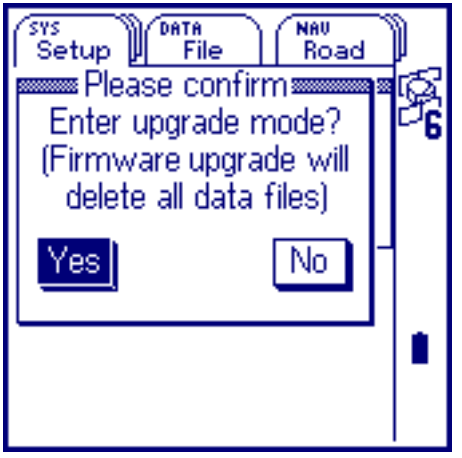


2. Connect one end of the null modem cable (part number 18532) to the serial clip. Connect the other end of the null modem cable to the COM1 or COM2 serial port of your computer.
3. Turn on the GeoExplorer 3.

4. Turn on the GeoExplorer 3. Go to the Setup tab and select **Reset**. The following menu appears:



5. Select Upgrade firmware. You are asked to confirm this action. Begin the option upgrade when the following screen appears:

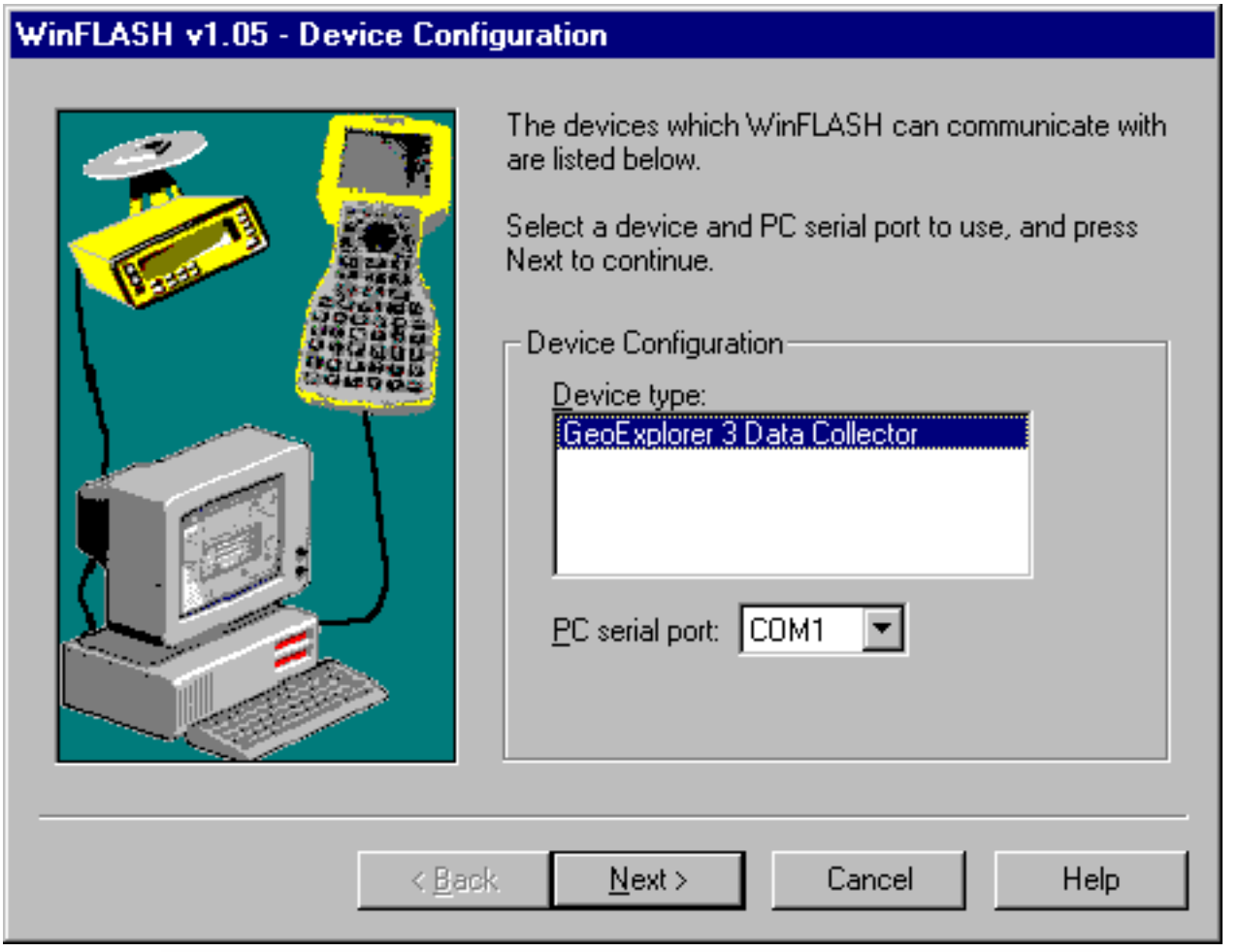


6. Turn to your office computer.

   For the firmware installation to proceed, the WinFlash software, which is used to install the GeoExplorer 3 firmware onto your GeoExplorer 3 data collector, must be installed onto your office computer, along with the GeoExplorer 3 firmware you want to install. The WinFlash program and GeoExplorer 3 firmware can be installed from the World Wide Web or from the installation CD (if you do not have Internet access).

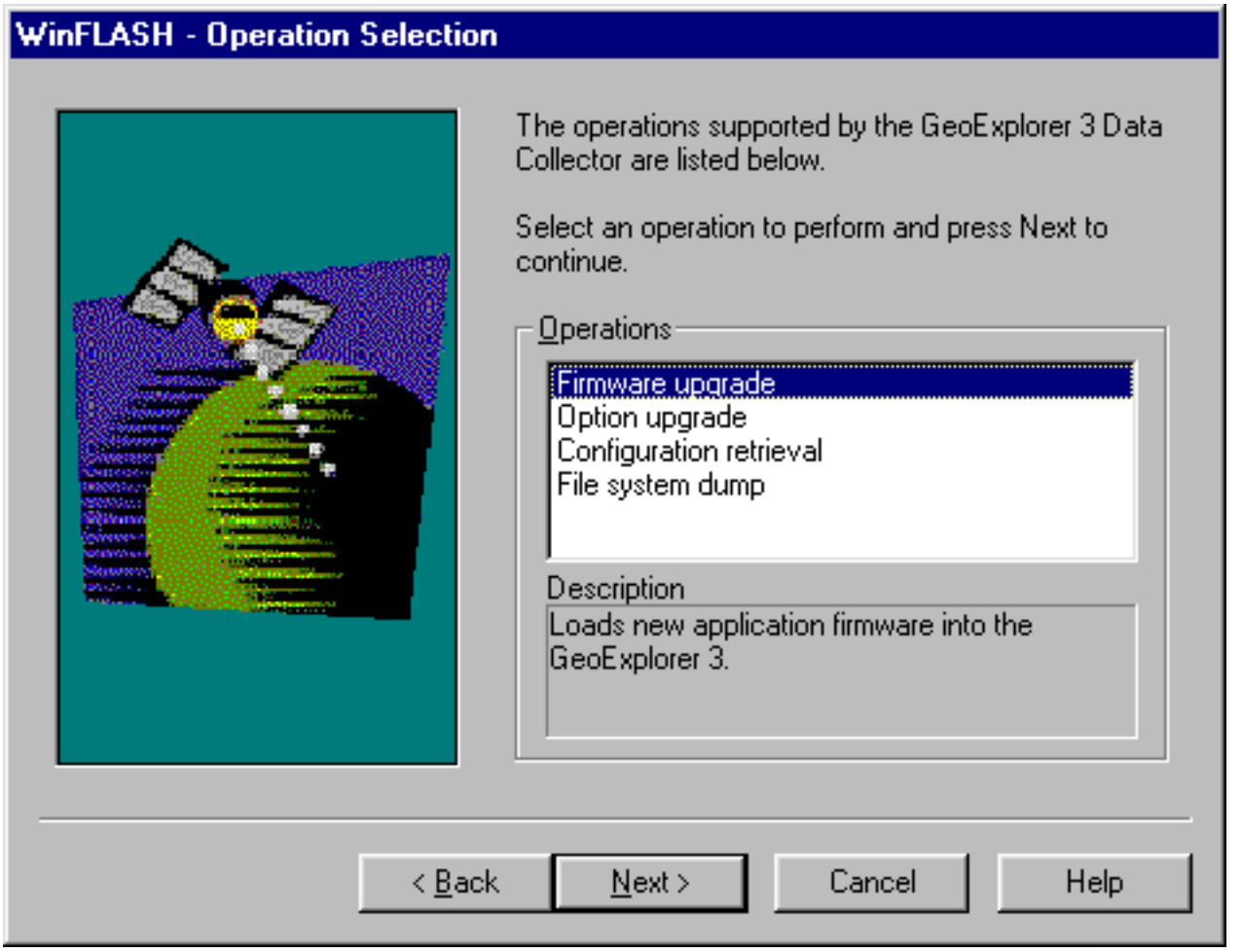
7. Start the WinFlash software. To do this, from the Windows Start menu select Programs / WinFlash / WinFlash.

A dialog similar to the following appears:



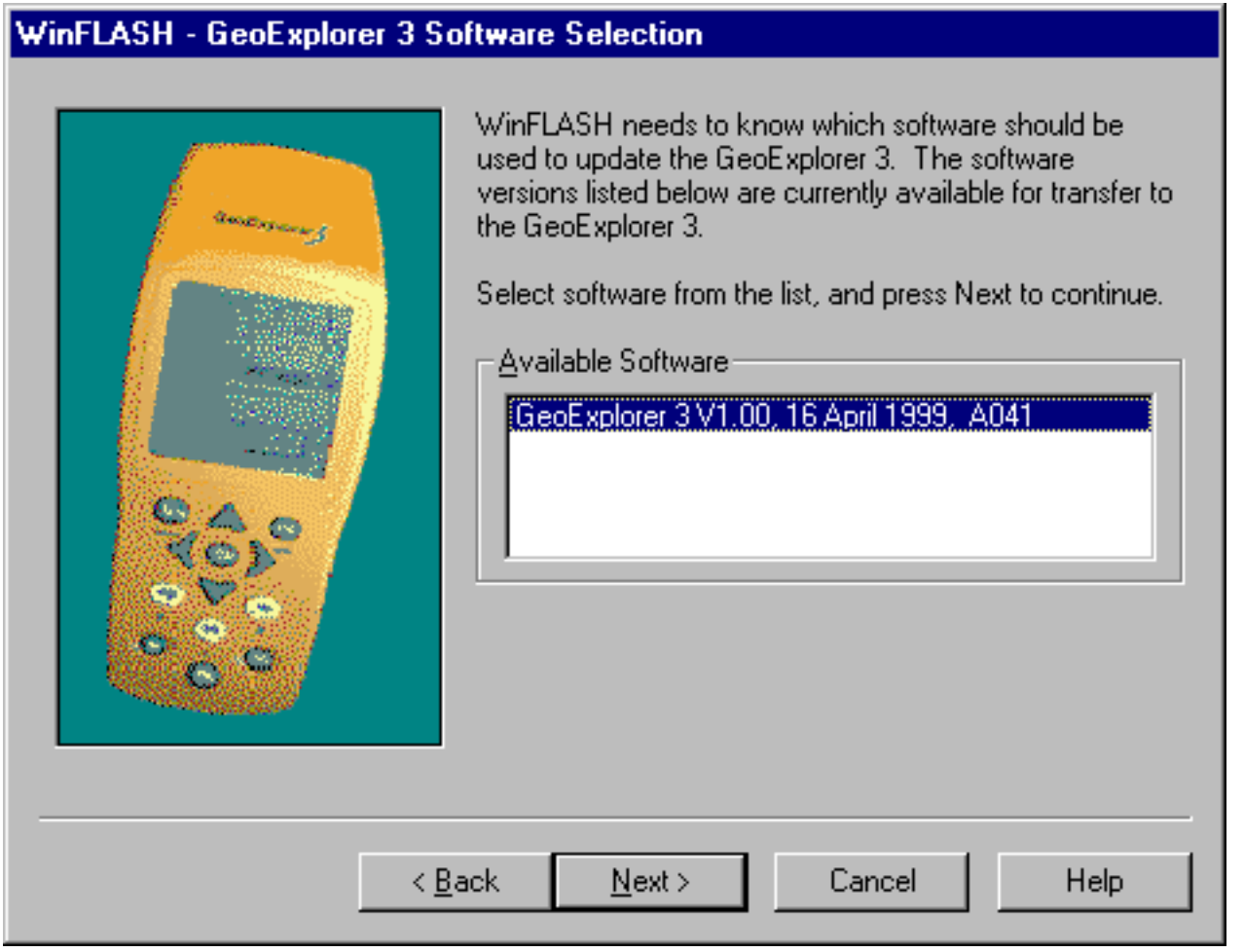
8. Select the GeoExplorer 3 data collector as the device type and specify the personal computer serial port that your GeoExplorer 3 is connected to.
9. Click **Next**.

The Operation Selection dialog appears:



10. Select the Firmware upgrade option and click **Next**.

The GeoExplorer 3 Software Selection dialog appears similar to the following:

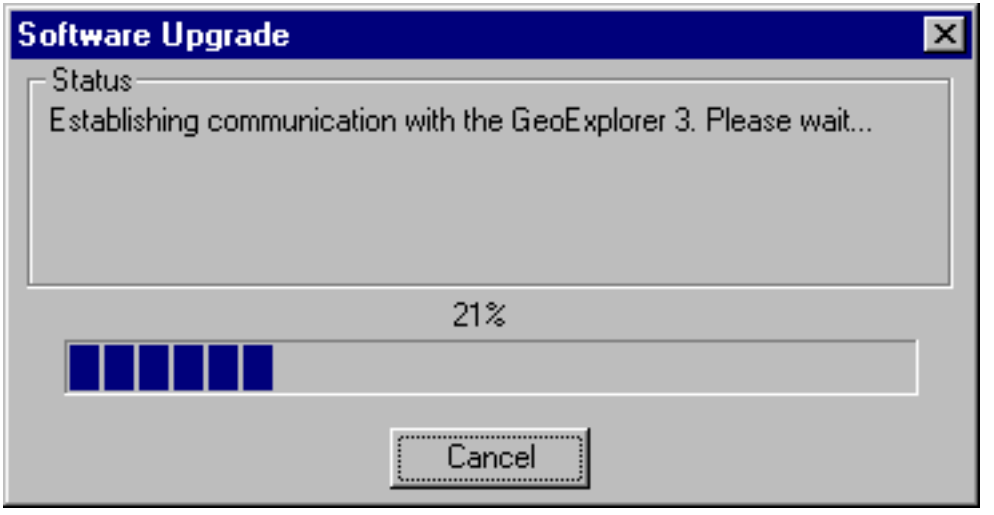


11. Select the firmware version you want to install onto your GeoExplorer 3 and click **Next**.

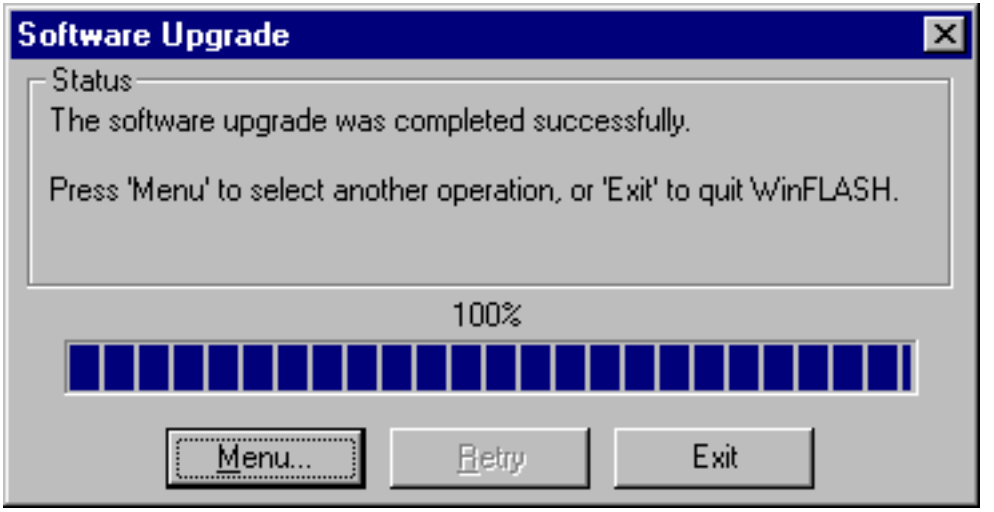
The Settings Review dialog appears similar to the following:

12. Review the current settings and click **Finish**. The program initiates communication with the GeoExplorer 3.

    A dialog similar to the following appears, indicating the progress status of the software installation:



The installation takes about five minutes. Typically, the transfer of the GeoExplorer 3 firmware to the data collector proceeds automatically. When the installation has completed, the following dialog appears on your computer:



13. Click **Exit** to close the WinFlash program.
14. Your GeoExplorer 3 reboots and automatically starts the newly installed firmware.

    The Trimble logo screen appears just after rebooting, identifying the new GeoExplorer 3 firmware and also showing the software version number.

WARNING Do not stop the firmware installation process on the office computer or the GeoExplorer 3 once it has started. Doing so may corrupt the firmware. If this occurs you may need to return your GeoExplorer 3 to Trimble for servicing.

GLOSSARY

Select a word from the following list to view its definition.

- almanac
- attributes
- base station
- baud
- bearing
- carrier phase
- code phase (C/A code)
- data dictionary
- datum
- declination
- differential correction
- ellipsoid
- feature
- geoid
- GGA message
- great-circle distance
- HAE
- heading
- horizon
- ionospheric noise
- latitude
- longitude
- magnetic declination
- magnetic north
- MSL
- multipath
- NAD-27
- NAD-83
- NMEA
- parity
- postprocessing
- pseudorandom number
- real-time differential GPS
- rover
- RTCM
- S/A
- selective availability
- .SSF file
- true north
- UTC
- UTM
- velocity
- VTG message
- waypoint
- WGS-84

almanac

An almanac is data, transmitted by a GPS satellite, which includes orbit information on all the satellites, clock corrections, and atmospheric delay parameters. The almanac is stored on the GeoExplorer 3. It is used to facilitate rapid acquisition of GPS signals when you turn the GeoExplorer 3 on, or when you have lost track of satellites and are trying to regain GPS signals.

attributes

Attributes are the characteristics of a **feature** in a Geographic Information System (GIS). For example a road may have a name or designation number, surface type, width, or a number of lanes. Each of these factors are attributes of the road feature, and could have a range of possible values.

The value chosen to describe a particular feature is called the attribute value. In our example of a road feature. For example, PINE ROAD could be the name value of the attribute and ASPHALT could be the surface type attribute.

base station

A base station is a GPS antenna and receiver positioned on a known location specifically to collect data for **differential correction**. Base data needs to be collected at the same time as you collect data on a rover unit. Base stations can be permanent stations that collect base data for provision to multiple users, or a rover unit that you locate on known coordinates for the duration of your datalogging session.

baud

Baud is a unit used to measure the speed of electronic code transmissions, generally one bit per second. The higher the baud rate, the faster the transfer of data. However, both the input and output device must be configured to the same baud rate for data to be successfully transferred.

bearing

A bearing is the direction from one point to another, usually measured clockwise from north. On the GeoExplorer 3, the bearing indicates the direction from your current position to the target waypoint or feature.

carrier phase

Carrier phase is the difference between the radio wave signal generated by your GeoExplorer 3 and the radio wave signal coming in from the satellite.The carrier phase is used to very accurately compute the distance to a satellite, which increases the accuracy of your position.

GPS satellites transmit on a frequency of 1575.42 MHz.

code phase (C/A code)

(also known as Course Acquisition code)

The difference between the **pseudorandom number** code generated by your GeoExplorer 3 and the pseudorandom number code coming in from the satellite. The code phase data is used to quickly compute the distance to a satellite and therefore calculate your position.

data dictionary

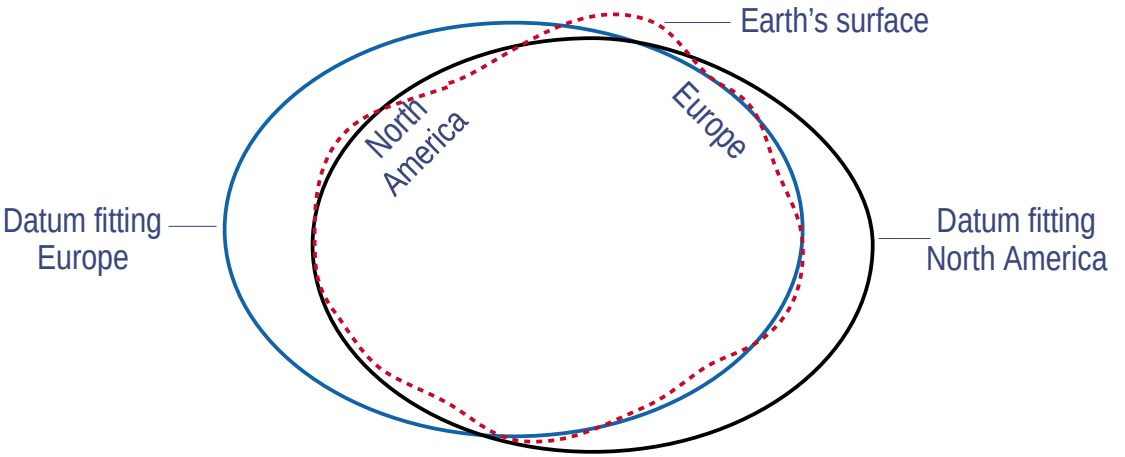
A data dictionary is a description of the objects to be collected for a particular project or job. It is used in the field to control the collection of the spatial and attribute information about these objects. The elements of a data dictionary could include a point, line, and area **feature**.

datum

A datum is a mathematical model of the earths surface. World geodetic datums are typically defined by the size and shape of an **ellipsoid** and the relationship between the center of the ellipsoid and the center of the earth.

Because the earth is not a perfect ellipsoid any single datum will provide a better model in some locations than others. Therefore, various datums have been established to suit particular regions. For example, maps in Europe are often based on the european datum of 1950 (ED-50).

Maps in the United States are often based on the North American datum of 1927 or 1983 (NAD-27, NAD-83). All GPS coordinates are based on the WGS-84 datum surface.



For more information refer to the GPS Mapping Systems General Reference or see **Coordinate systems**.

declination

See **magnetic declination**.

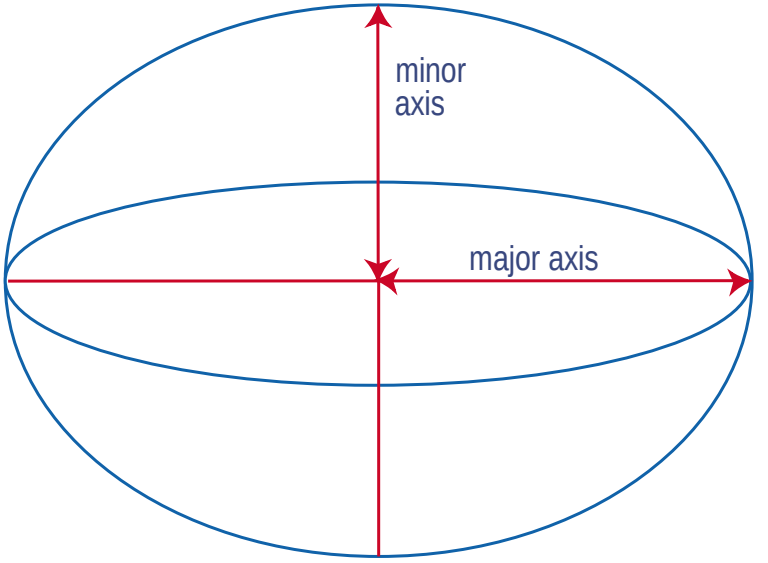
differential correction

Differential correction is the process of correcting GPS data collected on a **rover** with data collected simultaneously at a **base station**. Because it is on a known location any errors in data collected at the base station can be measured, and the necessary corrections applied to the rover data.

Differential correction can be done in **real-time differential GPS** or after the data has been collected by **postprocessing**.

ellipsoid

An ellipsoid is the 3D shape that is used as the basis for mathematically modeling the earths surface. The ellipsoid is defined by the lengths of the minor and major axes. The earths minor axis is the polar axis and the major axis is the equatorial axis.



For more information refer to the GPS Mapping Systems General Reference or see **Coordinate systems**.

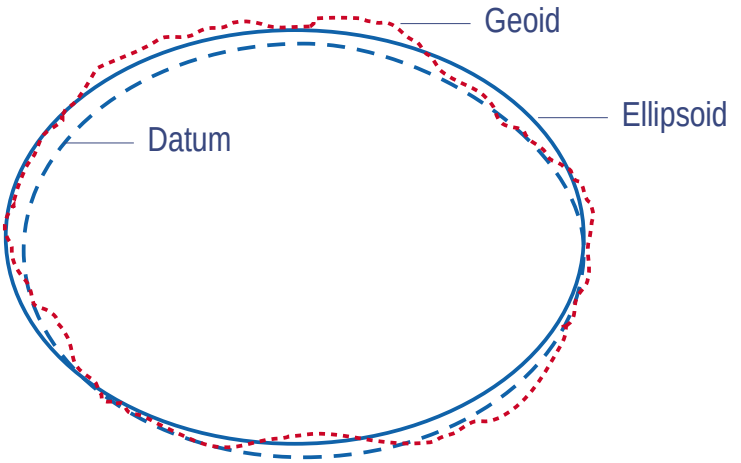
feature

A feature is a physical object or event that has a location in the real world, and which we want to collect position and/or descriptive information about. Features can be divided into points, lines and areas. For example, a water faucet is a point feature, a road is a line feature and a lake is an area feature.

Features are defined in a **data dictionary**.

geoid

A geoid is a 3D surface representing mean sea level (MSL) if it was projected to extend through the continents. Unlike an **ellipsoid** or **datum**, which have a symmetrical surface, the geoid undulates perpendicular to the force of gravity.



For more information refer to the GPS Mapping Systems General Reference or see **Coordinate systems**.

GGA message

A GGA message is a **NMEA** message containing GPS time, position, and 'fix' (type of position) information. GGA messages can be used to pass GPS positions from a GPS datalogger to marine navigation equipment.

great-circle distance

The great-circle distance is the shortest distance between two points on the surface of a sphere.

HAE

Height Above Ellipsoid

HAE is a method for referencing altitude. Altitudes expressed in HAE are actually giving the height above the **datum**. GPS uses the **WGS-84** datum and all heights are collected in relation to this surface. It is important to use the same datum when comparing altitudes in HAE.

heading

The heading is the direction you are facing or traveling, usually measured clockwise from north.

horizon

The line at which the earth and sky seem to meet.

ionospheric noise

The effects that the ionosphere has on GPS signals. The ionosphere is the band of charged particles 100 to 200 kilometers (60 to 125 miles approximately) above the surface of the earth.

latitude

Latitude is an angular measurement made from the center of the earth to north or south of the equator. It comprises the north/south component of the latitude/longitude coordinate system, which is used in GPS data collection.

Traditionally, north is considered positive, and south is considered negative.

longitude

Longitude is an angular measurement made from the center of the earth to the East or west of the Greenwich meridian (London, England). It comprises the east/west component of the latitude/longitude coordinate system, which is used in GPS data collection.

Traditionally, east is considered positive, and west is considered negative.

magnetic declination

Magnetic declination is the difference between magnetic north and **true north**. Declination is expressed as an angle and differs between locations.

magnetic north

Uses the north magnetic pole as the reference to north.

MSL

Mean Sea Level

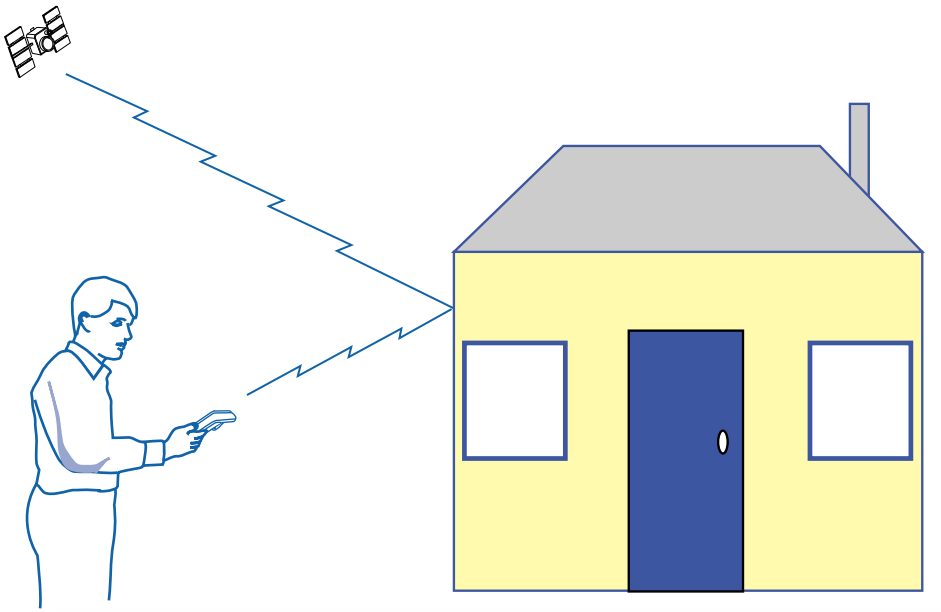
MSL is a method of altitude reference. Altitudes expressed in relation to MSL actually give a height above the **geoid**.

It is important to use the same geoid when comparing altitudes in MSL.

multipath

Multipath occurs when GPS signals arrive at the datalogger having traveled different paths. For example, this may happen if some signals are reflected off a building, before reaching the datalogger. If a signal takes a longer path it will show a larger distance to the satellite and therefore decrease position accuracy.

For more information refer to the GPS Mapping Systems General Reference.



NAD-27

North American Datum of 1927. A horizontal **datum** employing the Clarke 1866 **ellipsoid**. Height values of this era are expressed in NGVD (National Geodetic Vertical Datum) of 1929.

NAD-83

North American Datum of 1983. A horizontal **datum** employing the GRS-80 **ellipsoid**. Its geometric definition is almost identical to the **WGS-84**. For GPS purposes, the NAD-83 and WGS-84 datums are identical.

NMEA

NMEA is a standard, established by the National Marine Electronics Association (NMEA). The standard defines electrical signals, data transmission protocol, timing and sentence formats for communicating navigation data between marine navigation instruments.

The GeoExplorer 3 uses these standards to communicate to marine navigation instruments.

parity

A digital message is composed of 0's and 1's. Parity is a form of error checking that sums the 0's and 1's of the digital message. A parity error results when one of the bits is changed so that the parity calculated at message reception is not the same as it was at message transmission. Options for parity checking include even, odd, and none.

Typically you should have the same parity setting on your GeoExplorer 3 as on the external device you are communicating with.

postprocessing

Postprocessing is the processing of satellite data after it has been collected, in order to eliminate error. This involves using PC software to compare data from the rover to data collected at the base station.

Because the base station is on a known location any errors can be determined and removed from the rover data.

pseudorandom number

The pseudorandom number (PRN) is the code of 0's and 1's transmitted by GPS satellites, which appears to be random 'noise', but is actually a complex pattern that can be exactly reproduced.

Each satellite has its own unique PRN code, which together are used by the GeoExplorer 3 to calculate **code phase (C/A code)** positions.

real-time differential GPS

(also known as real-time differential correction, DGPS)

Real-time differential GPS is the process of correcting GPS data as you collect it. This is achieved by having corrections calculated at a base station sent to the datalogger a few seconds in advance via a radio link. As the rover receives the position it applies the corrections to give you a very accurate position in the field.

Real-time differential correction is usually applied to **code phase (C/A code)** positions.

rover

A rover is any mobile GPS datalogger collecting or updating data in the field, typically at an unknown location. Data collected on a rover can be differentially corrected relative to base station data.

RTCM

Radio Technical Commission for Maritime Services (RTCM)

A commission established to define a differential data link for the real-time differential correction of roving GPS receivers. There are two types of RTCM differential correction message. However, all Trimble GPS receivers use the newer version 2 RTCM protocol.

S/A

See **selective availability**.

selective availability

(also known as S/A)

Selective availability is the artificial degradation of the GPS satellites signal by the US Department of Defense (DoD) to control the accuracy of position measurements. The program causes the user to receive a false measurement with up to 100 meters error.

differential correction techniques can reduce these effects on a local scale.

.SSF file

A Trimble Standard Storage Format (SSF) data file that stores GPS data from a mapping receiver.

true north

Uses the north celestial pole as the reference to north.

UTC

Universal Time Coordinated.

UTC is a time standard based closely on local solar meantime at the greenwich meridian (GMT). GPS time is directly related to UTC.

UTM

Universal Transverse Mercator Map Projection.

A special case of the Transverse Mercator projection. Abbreviated as UTM, it consists of 60 north/south zones, each 6 degrees wide in longitude.

velocity

Velocity is essentially a measure of speed, that takes into account direction of travel as well as the distance traveled over a period of time.

VTG message

An **NMEA** message containing actual track made good and speed over ground.

waypoint

A waypoint is a geographical point that, unlike a feature, holds no attribute information beyond a name and location. Typically waypoints are used to denote objects whose locations are of primary interest, such as a survey mark. Waypoints are most often used for navigation.

WGS-84

WGS-84 is an abbreviation for World Geodetic System 1984. WGS-84 has superceded WGS-72 as the **datum** used by GPS since January 1987.

The WGS-84 datum is based on the **ellipsoid** of the same name.

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Legal information

Copyright

Release Notice

This is the August 1999 release (Revision A) of the GeoExplorer 3 Operation Guide. It applies to version 1.00 of the GeoExplorer® 3 software.

Trademarks

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Microsoft, MS-DOS, Windows, Windows 95, and Windows NT are registered trademarks or trademarks of Microsoft Corporation. Intel is a registered trademark of Intel Corporation. All other marks are the property of their respective owners.

Status bar icons

Number of satellites in use.
If number flashes—too few satellites.
If satellite flashes—poor geometry.

GPS positions are real-time corrected.
Flashes if RTCM signal is lost.

External antenna is connected and in use.

Some configuration settings are password locked.

Memory is low.

The backlight is on.

The bright backlight is on.

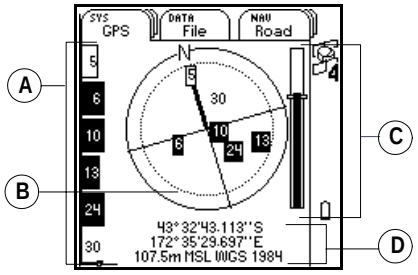
Internal power level indicator. “Fills up” when charging. Flashes when power level is low.

Code precision data logging—the number shows how many positions have been logged. Flashes when GPS unavailable.

Carrier precision data logging.

Logging is paused. Press LOG to resume.

GPS tab



NOTE – When the skyplot is fixed to North up, calibrate the digital compass.

Satellite legend

Black boxes:	Satellite used to compute GPS positions.
Clear boxes:	Satellite tracked but not used.
No boxes:	Satellite available but not tracked.

A Signal strength: Satellites with signal strengths below the configured SNR mask are not used.

B Skyplot: Outer circle shows the horizon. Inner circle shows the configured elevation mask. Satellites below the elevation mask are not used.

C Satellite geometry: GPS quality depends on the geometry (PDOP) of the satellites. If the quality falls below the cutoff level then GPS positions will not be computed.

D Current position: Displays the current GPS position.

Function keys

Fn CLOSE	Cancel—close screen and abandon changes
Fn OPTION	Menu—display the Main menu
Fn SYS	Lighten screen display
Fn DATA	Backlight mode (On/Bright/Off)
Fn NAV	Darken screen display
Fn △	Page up / Pan up
Fn ▽	Page down / Pan down
Fn ◁	Home / Pan left
Fn ▷	End / Pan right

Troubleshooting

If GPS positions are not being logged, move away from obstructions, wait until more satellites are in view, or change the GPS settings to include more satellites.

Rebooting

WARNING – A Cold boot will erase all data and reset all configurations to factory defaults!

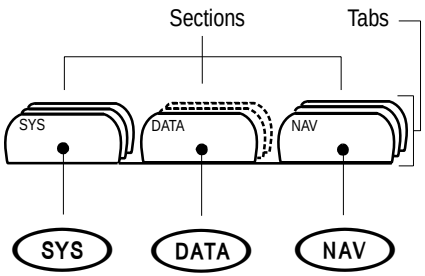
Warm boot

If the GeoExplorer 3 will not respond: Hold down ⏻ to turn GeoExplorer 3 off. Turn GeoExplorer 3 on again.

Cold boot

If still no response repeat warm boot. At the start-up screen, hold down ENTER and DATA until **`Formatting Flash Sys`** appears.

Moving around the system



Press these keys to move between **sections**. Multiple presses move to the next **tab** in that section.

Accessing options

OPTION

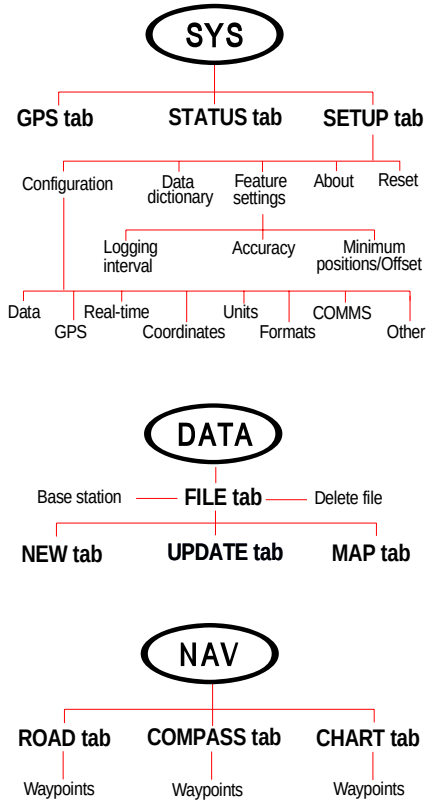
Press this key to access all **functions** for the current screen.

Main menu

Fn + OPTION

Press this key combination to display the **Main menu**, an overview of all sections and tabs.

Section / Tab layout

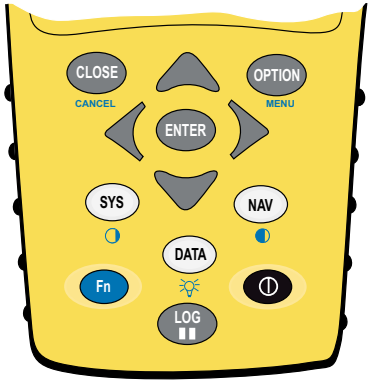


Trimble

GeoExplorer 3 QuickStart

Part Number: 38598-00-ENG

Keys



CLOSE	Close the current screen (and save changes)
ENTER	Select highlighted item
OPTION	Display more functions
SYS	Go to / cycle SYS tabs
DATA	Go to / cycle DATA tabs
NAV	Go to / cycle NAV tabs
Fn	Use second key function (blue) (see Function keys)
LOG	Pause/Resume logging
⏻	Power On/Off

Next