Spot
user manual

Skylab's positioning and orientation tool

Version 1.2.0

Contents

1 Introduction

Combine the power of GPS with worldwide maps and a flexible waypoint management. Orientation and routing enables you to find interesting places, store and share them with others.

Spot Features:

- Position Info: coordinates, height, speed, heading, signal strength and time

- Map: integrated worldmap, map download from the internet or import of your own maps, displaying of combined waypoint and map layers

- Waypoint Management: add, edit, categorize, import and export your waypoints

- Satellites: get the position information of satellites in view

- Elevation: elevation graph of your track

The usage of modern Java Technology enables us to offer Spot for a wide range of portable devices. Mobile phones and PDAs (running PalmOS or Windows) are the supported platforms of this version. The GPX waypoint format support assures an easy to use waypoint exchange and a trouble-free integration into other applications. Our unique combination of GPS positioning and WMS map server access allows you to navigate on the map of your choice from the endless pool available on free WMS servers all over the world. Being a geo-interested traveller you can memorize all the highlights on your trips, visualize your tracks or use Spot to lead you to some nice places. Waypoints are available from different databases on the internet and can be imported on the fly. This definitely is a nifty way to explore new places! Discover nice hangouts, add additional information to the waypoint and let other people know about them. And for our geo-treasure hunting friends out there, *Spot* offers the import of waypoints and descriptions based on www.geocaching.com.

2 Installation

2.1 Devices

This version of *Spot* can be used on a broad spectrum of mobile devices. Java enabled cell phones, smartphones and PDAs can be used. However, due to this diversity the installation process differs depending on the device.

2.2 Requirements

Spot is designed to run on every MIDP2.0/CLDC1.0 compatible device, which is supported by almost every modern mobile phone and PDA. Due to memory limitations, there are however a few devices which are currently not fully supported. If you want to use Web Map Services you will need a working network connection. In most cases this will be GPRS, UMTS or IEEE802.11 (WLAN). For positioning you can use one of the wide range of supported positioning devices/methods:

- Bluetooth GPS receiver (via JSR-82 or Bluetooth over virtual serial port)

- GPS receiver via serial cable

- device integrated or CompactFlash / SD/IO GPS receivers which emulate a serial port

- JSR-179 location API

- GPS / NMEA server on the network

To be able to import and export waypoint files (LOC and GPX formats are supported) your mobile device must fit the standardized JSR-75 specification for file access.

Note: Even if the given requirements are not all supported by your mobile device, Spot should run too, but it will be limited. Though the not supported features of your device will not be accessable. Therefor we provide a demo version to you can check that out.

2.3 Installation - over the air (OTA)

Using OTA installation, *Spot* for Blackberry can be downloaded via Internet on to the device and installed directly. This is the easiest method to install *Spot* for Blackberry on your device. OTA is supported by many devices but not all. The device needs a working internet connection. You can use a WAP browser or a microbrowser to access the Skylab Mobilesystems OTA Download Center and install it directly.

The OTA download link for the most recent demo version of *Spot* can be found here:

`http://micro.skylab-mobilesystems.com`

Be sure to choose the right link. *Spot* is located under the corresponding title. There are two versions for mobile devices available: *Spot* and *Spot* for JSR-179. If your mobile device supports JSR-179 (Location API) you can choose the second one. If not, you have to choose the first one without JSR-179 support. Because some devices only support an installation of .jar files while others support only .jad files and again others support both of them, we provide for each version the download link as `spot.jad` and `spot.jar` file. If you are not sure which installation is supported by your device, you can simply find one by trying one of them.

Note: Do NOT download the `spot.jad` located under the Spot for Blackberry title. This version will not work on common cell phones and PDAs.

2.4 Installation - manual

To do a manual installation you have to copy *Spot* via cable, Bluetooth or IRDA to the device. You have to deflate the zip-archive and copy the .jar and where required also the .jad file. The program is in the file `spot.jar`. Some devices also need an application description which is in the additional `spot.jad` file.

2.5 Installation - on PDAs

Most of the PocketPC and Palm PDAs on the market do not have an integrated Java VM. To use *Spot* on this devices you have to install a Java VM first. Spot has been tested on the most common Java VM J9 from IBM. You can get the J9 VM here:

IBM J9 VM for PalmOS: `http://www.palmone.com/us/support/jvm/download.html`

IBM J9 VM for PocketPC: `http://www-306.ibm.com/software/wireless/weme/`

2.6 Registration

Spot comes per default as a demo version and supports the full broad of functions with time limitation. To check wheather you have a demo or full version installed, you can go to the *About* screen.

If the installation is a demo version there will be written: *Not registered!*

If it is a registered version there will be written: *Registered to: YOUR NAME*

To register you demo version of *Spot* click *Register Spot* and enter your name and serial

number you have received from Skylab Mobilesystems or one of our distributors.

Handango: Please insert the **key** in the serial field.

Share-it: Please insert your **Registration Name** in the name field and the **license key** in the serial field.

3 Usage

3.1 Get it working - Settings

3.1.1 Location Provider

The *Location Provider* is an important part of *Spot*. This component provides the positioning function for all position based features. A location provider must be activated to get the positioning support work. But you have to select a positioning device first. The following Loaction Providers are supported by *Spot*:
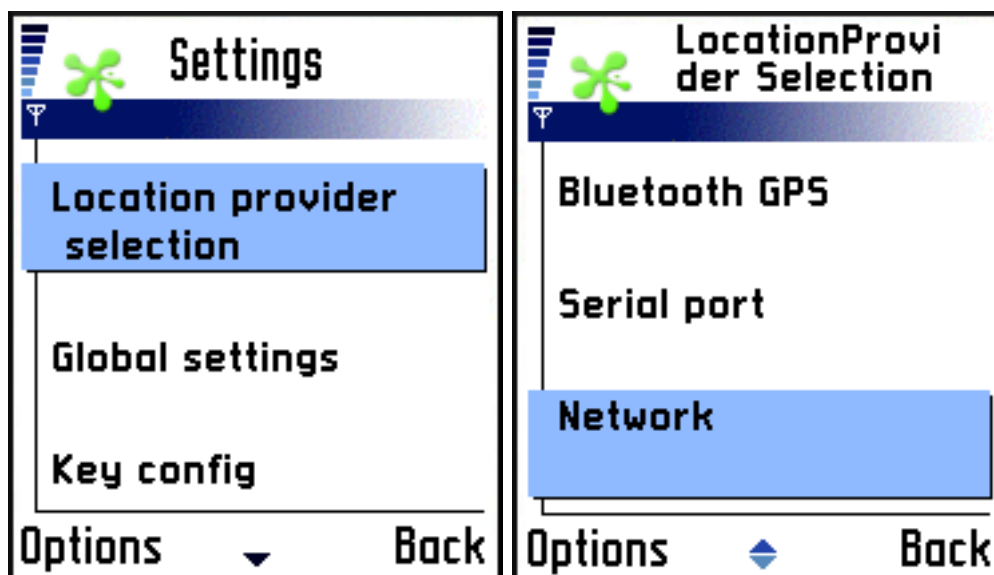
Bluetooth GPS

If your device supports the Bluetooth API JSR-82 (you can check this in hardware info screen `Settings→Hardware info`), you can use your Bluetooth GPS device with this location provider. Some devices support Bluetooth only on virtual serial ports. For that kind of devices you have to use the "Serial port" location provider. The Bluetooth for devices in range starts by starting *Spot*. Go to the Bluetooth settings to select one of the discovered devices. (`Settings→Location provider selection→Bluetooth GPS`)
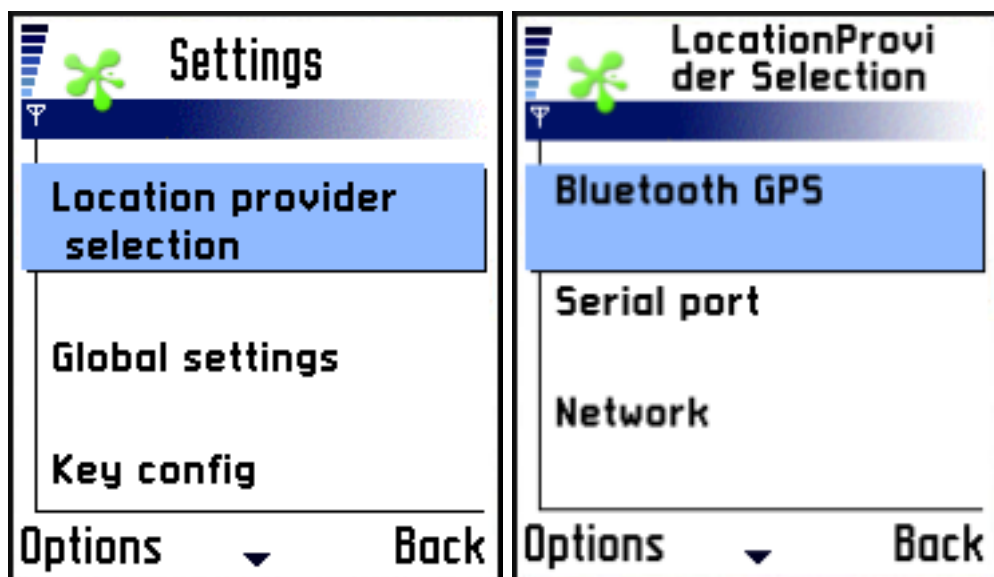
Now you can select your Bluetooth GPS as location provider.

Network

Spot can connect to a NMEA/GPS server on a network. You have to provide the IP address and the port of the server. Be sure that your network connection (e.g. GPRS) is already configured. (Settings→Location provider selection→Network)

Serial port

A serial GPS device must be connected to your mobile device via cable over a serial port. The default setting of most GPS receivers is 4800 baud, databits 8, stopbits 1 and parity none. The serial port location provider can also be used to connect to infrared and Bluetooth GPS receivers if they have been mapped to a virtual serial port by the operating system of the mobile device. (`Settings`→`Location provider selection`→`Serial port`)

Location API (JSR-179)

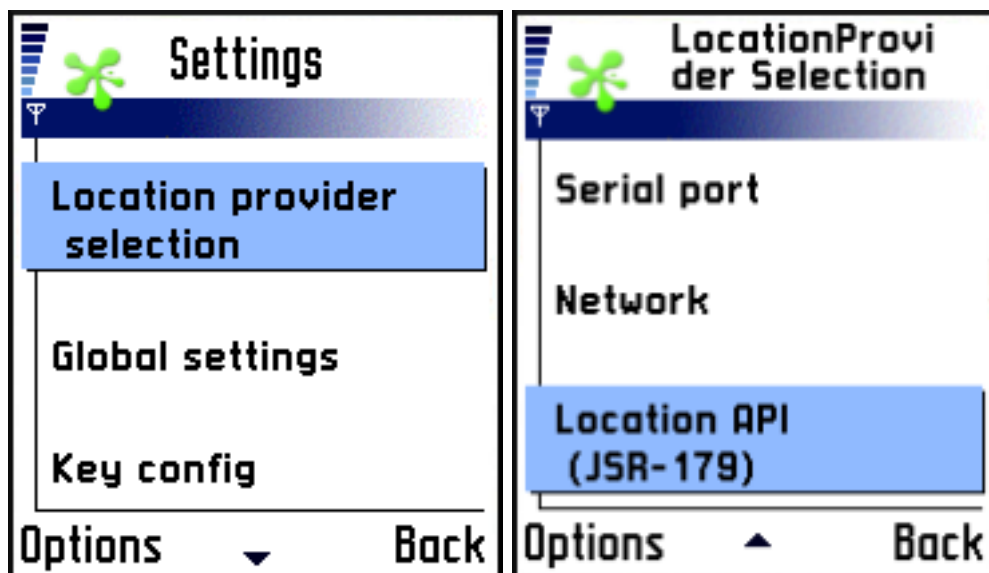Location API support is usually provided by devices with an integrated GPS receiver or another kind of positioning method, like getting the positioning data from the network carrier. No settings are needed, just activate it: (Settings→Location provider selection→Location API (JSR-179))

3.1.2 Global settings

You can alter the following global settings:

Center map to location   Automatically centers the map to the current position.

Show position on map   Shows the latitude/longitude of the current position on the map screen.

Power saving mode   Activating this option will cause a lesser usage of the positioning device and should decrease the battery drain. This option is dependent to the JSR-179 support and therefor cannot be choosen choosen on devices which do not support this feature.

Reduce canvas height   Due to a bug in some Java VM implementations which report a wrong height to *Spot*, the lower border might not be displayed correctly. You can select an offset to reduce the size of the canvas here.

Fullscreen mode   Sets up *Spot* to display all drawing components (Map, Elevation, Satellites, etc.) in fullscreen mode. This setting is optional because some devices (like Nokia phones) do not support this feature.

Units   You can choose between the metric and imperial unit representation.

Time   You can choose between local time and general mean time (GMT/UTC).

Draw text background   By activating this option, the text (position, button action) in the map will be painted on a background.

Check on startup for new version   Activating this option effects in an automatically check for the most recent online version of *Spot*.
The settings will be saved on your mobile device and reloaded by the next start of the application.

3.1.3 Key Configuration

Spot supports a wide range of devices which often have different key bindings. If the default binding does not work for you, or you want to change the key layout, you can do that here. You have to press a key for each description and select "next key" from the menu until all keys have been set.

3.1.4 Hardware Info

Device specific information like CLDC and MIDP versions and JSR capabilities can be looked up here.

3.1.5 Log

The application's log for information and debugging purposes.

3.2 Position Info

The Position Info screen shows the current position data like longitude, latitude in decimal degrees as well as height, speed and time information. A common Position Info screen may look like this:
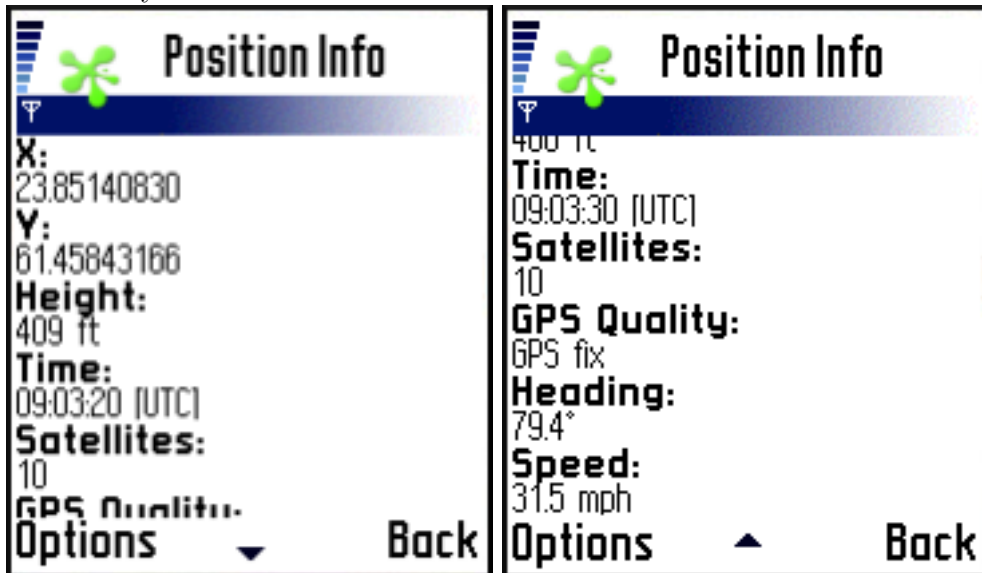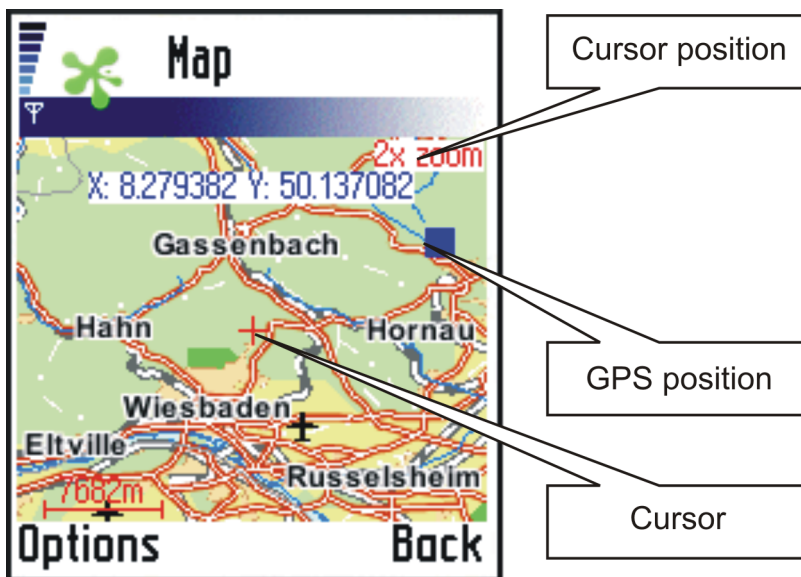
3.3 Map

The Map view shows your current position on data layers.

Spot supports the following data layers:

- OGC Web Map Service

- Georeferenced map image files

- Waypoints / Points of interest

- Tracklog

- World map

3.3.1 Navigation in the map

You can navigate within the map by pressing the corresponding keys to zoom and pan, or let the location provider automatically pan to the current position. The key layout for map navigation is device-dependent, and the default configuration might not work on your device. The key layout can be changed (`Settings→Key config`). The configuration is saved in the permanent storage and gets automatically reloaded on the next start of *Spot*. The default key configurations assumes 4 keys pointing in all directions and a key for the switch mode. There are two modes for map navigation: **zoom** and

pan. Using the **zoom**-mode you can zoom in with the "arrow up"-key or zoom out with the "arrow down"-key. The mode can be changed by pressing the center key. The current mode is displayed in the upper right corner. Using the **pan**-mode you can move in the map with the four arrow keys.

*Note: If your client supports pointer events (see below), there are three modes: **zoom in**, **zoom out** and **pan**. Using keys instead of the pointer, the **zoom in** out **zoom out** modes have the same behaviour.*

If you activate the "center map to location" feature the **pan**-mode is replaced by **auto center**. Panning is done automatically depending on your position. To avoid a too frequent recentering of the map, which might result in new Web Map Service request if you have selected a WMS layer, the map is only recentered if the current position exceeds a radius of 20 pixels from the display center. This feature can be activated/deactivated at:

Settings→Global Settings→center map to location

or

Map→Global Settings→center map to location.

In **zoom** mode there are 3 differnt zoom levels: 2x, 4x and 8x. You can switch the zoom level with the space-key or the key you have configured in your settings.

If your device has a touch screen and supports pointer events (you can check this in hardware info screen Settings→Hardware info) it is possible to use the touchscreen for navigation in the map. There are three modes: **zoom in**, **zoom out** and **pan**. The mode can be changed by pressing on the current mode displayed in the upper right corner.

3.3.2 The Layer manager
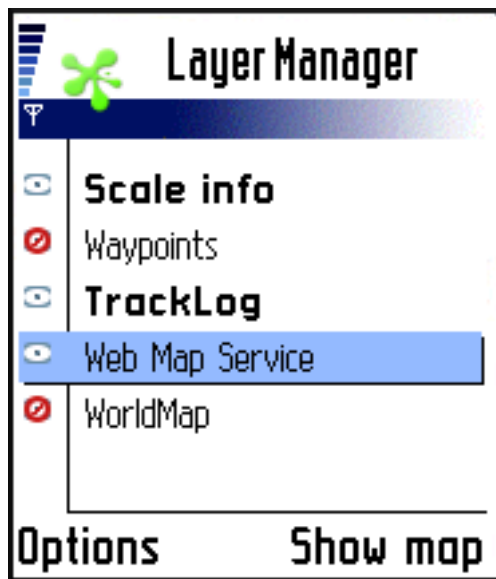
To add new layers or to change the visibility you can activate the "Layer manager" in the menu. The Layer manager shows a list of all currently loaded layers and their status. The state can be either visible (checkbox is checked) or invisible (checkbox is unchecked).

Scale info is a special layer which adds scale information to the lower left corner of the map. The layer on top of the Layer manager list will be visualized on top of the map. Some layers might overlap, so you can change the order with the commands **Move layer up** and **Move layer down**. Each layer can be deleted with the command **Delete layer**. After deleting the layer it can no longer be used. Usually you would just want to turn the visibility off.

3.3.3 Web Map Service

```
Web Map
Service
7/300        ABC
○ Terraserver Satel...
○ Terraserver Topo
○ JPL World Map Se...
◉ <custom map serv...
custom service
capabilities URL
http://
Options      ▲    Cancel
```

Due to the compliance to the OGC (Open GIS Consortium) WMS standard, you have access to a huge amount of free Web Map Services which deliver topographic, aerial and street maps directly to your mobile. Your are not bound to a subscription based service or restricted to use a specific proprietary map service. Skylab Mobilesystems hosts a list of public accessible WMS services at `http://www.skylab-mobilesystems.com/en/wms_serverlist.html`. Each WMS usually allows you to select multiple layers which are rendered into one image by the server. Spot has some example WMS URLs integrated. To change the default WMS select: `LayerManager`→`Web Map Service`→`Options`. You can use a custom WMS by entering the Capabilities URL.

3.3.4 Georeference map image file layer

If your device supports the PIM/File Access API JSR-75 (you can check this in hardware info screen: `Settings`→`Hardware info`) it is possible to load your own map-image files. To add your map image as a data layer go to:

`Map`→`LayerManager`→`add geo file`

Note: This option only appears if JSR-75 is supported.

Spot will automatically georeference your map images if a world file is available. A world file is a text file which has the same name as the map image but a different file

extension and contains georeferencing information. If you do not have a world file you can georeference your map image manually by entering the coordinates of the upper left and lower right corner of the image in decimal degrees. Remember that some devices do not support all image formats. The PNG format however is supported by every device. Spot supports the following image / world file formats:

image format	world file
.png	.pgw
.gif	.gfw
.jpg / .jpeg	.jgw
.tif / .tiff	.tfw
.bmp	.bfw

You can add as many map image layers as you want. Just keep the usual memory restrictions of your device/Java VM in mind.

3.3.5 Waypoints layer

The waypoint layer visualizes all wayoints on the map. Each waypoint is visualized with the corresponding waypoint category icon or a red rectangle if no icon has been selected. All waypoints are labeled with their name if it fits on the map screen without colliding with other labels. If you can't see the labeling, it is most likely that there are several waypoints clustered together. You can zoom in to reduce the amount of visualized waypoints.
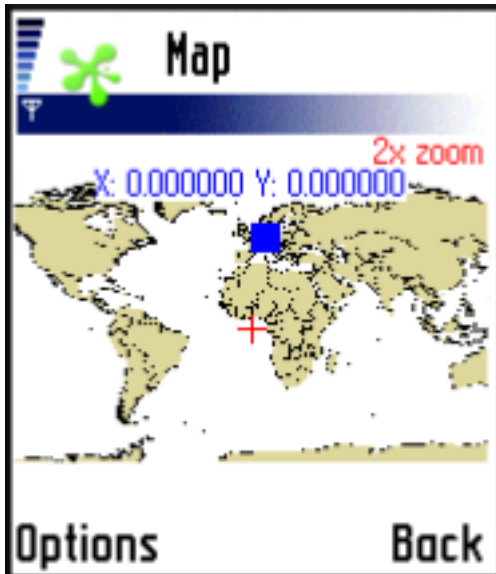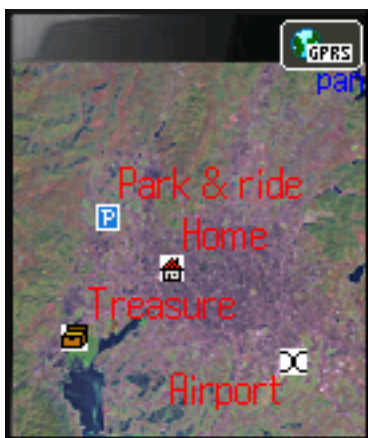
3.3.6 TrackLog layer

The tracklog layer visualizes your track on the map.

3.3.7 WorldMap layer

The Worldmap layer displays a map of the world for a rough orientation. If you need a more detailed map you might want to add a Web Map Service layer or a map image layer.

3.4 Waypoints

The waypoint view allows you to manage your wayponints. You can add, browse, import, export waypoints or use the routing feature.

3.4.1 Add Waypoint

This option allows you to create a new waypoint. If the location provider delivers a position, the latitute, longitude, and height field will be automatically filled with the data of the current position. You can change them if you want. If no position is available, the fields default to "0.0". The following data can be entered:

- X: the longitude in decimal degrees

- Y: the latitude in decimal degrees

- Z: the elevation in meter or in feet (go to `Settings→Global Settings→Units` to change this setting)

- Category

- Name: a short name for the waypoint, limited to 20 characters

- Description: description or additional information of the waypoint, limited to 200 characters

3.4.2 Browse Waypoints
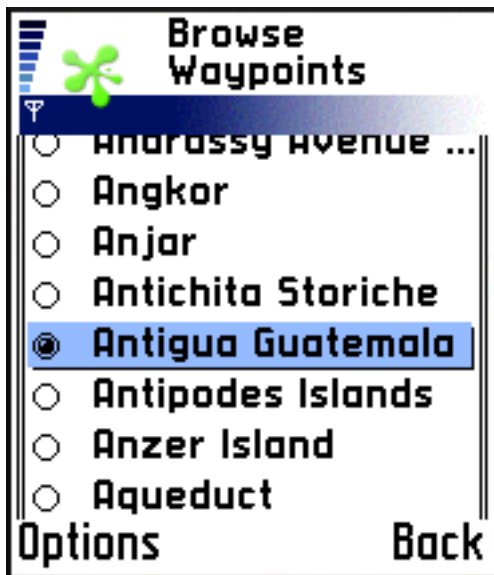
You can browse through all waypoints stored on your device. Each waypoint is visualized in the list with the waypoint name and its corresponding category symbol. You

can do the following operations on the selected waypoint: **Edit**, **Delete**, (show) **Details**.

Details: Shows all available information of the selected waypoint.

Edit: You can edit each field of the waypoint as in `Waypoints→add Waypoint`.

Delete: Deletes the selected waypoint.

Route to: Route to an existing waypoint from the current position. To allow the routing to a waypoint, select one in the list and activate the routing screen by pressing **select**. If you have not created or imported waypoints before, the list will be empty. The routing screen will show you a blue arrow that tells the direction you should go toward your target. Furthermore you receive information like the waypoint name, the current speed, the estimated time of arrival (ETA) and the estimated time en-route (ETE). The background circle of the direction arrow is a compass. The red line of the circle shows the north direction based on the GPS heading.
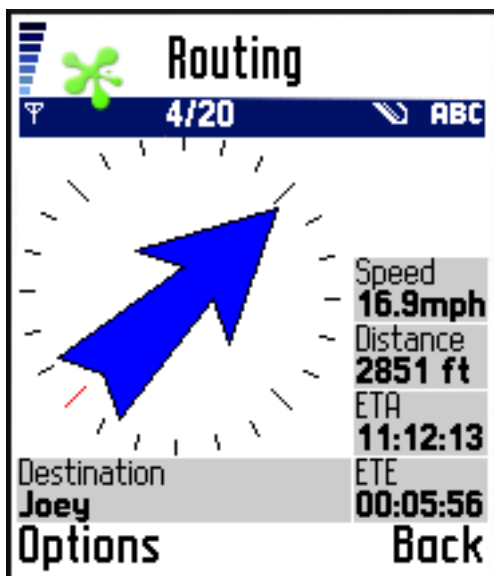
Note: If you are not on the move, some GPS receivers will send a speed of 0 km/h (mph) and a heading of 0 degrees. So this may result in a direction relative to north. Furthermore ETA and ETE cannot be calculated.

3.4.3 Manage Categories

You can manage your waypoint categories here. Each waypoint belongs to one category. If no category is specified, the waypoint belongs to the default category. You can **add**, **delete**, or change the **icon** of a category.

Add: Creates a new waypoint category.

Select Icon: Choose an icon for the category, it allows you to quickly identify the type of each waypoint on the map.

Rename: Renames an existing category.

Delete: Deletes the selected category. If the category contains waypoints, you can choose to move them to the default category or delete them as well.

3.4.4 Get geocaching details for waypoint

Spot has an extensive build-in geocaching support. For geocaches from `http://www.geocaching.com` the cache description can be downloaded on the fly. After downloading, the cache description will be added to the waypoint description. Therefor go to `Waypoints→Browse Waypoints→Details→Get cache description` to download it.

3.4.5 Waypoint import/export

You can import waypoints in the popular waypoint formats GPX and LOC. Waypoints can be exported as GPX file. Details on other applications supporting GPX and sites with GPX waypoints can be found at `http://www.topografix.com/gpx.asp`.

To import waypoints from a website select `Waypoints→GPX import (web)` or select `Waypoints→LOC import (web)`. The waypoints will be downloaded to your device and integrated into the *Spot* waypoint database. The waypoints will be stored in a new category with the name of the download URL.

If your device supports the PIM/File Access API JSR-75 (check this in the hardware info screen `Settings→Hardware info`) it is also possible to load GPX and LOC files from the file system of your device. Select `Waypoints→GPX import (file)` or `Waypoints→LOC`

import (file) to do this. By using JSR-75 you can export the *Spot* waypoint database to a GPX file (Waypoints→GPX export (file)) to share your waypoints or process them in other applications.

Note: These options only appear if JSR-75 is supported.

3.5 Satellites

The satellite view is a passive component as well. It shows the current positions of satellites in view and their signal strength. The closer a displayed satellite is to the large circle, the closer is the satellite's position to the horizon. The closer to the ring's center, the more it is above you. The inner circle symbolizes positions in an angle of 45° somewhere between the horizon and you. The bars show you the single satellite's strength.
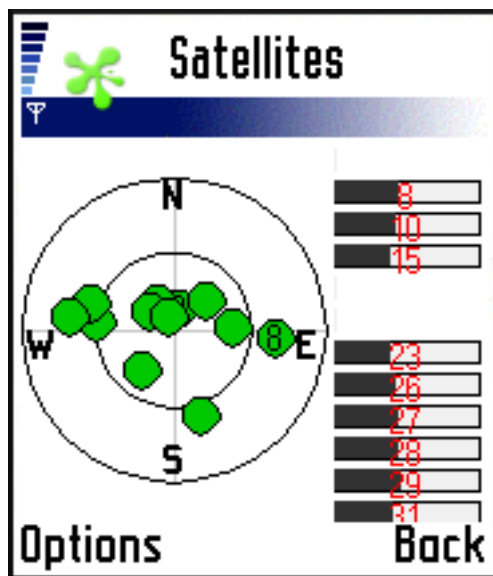

3.6 Elevation

The elevation screen shows the track elevation of the current tracklog (tracklog can be made visible in the map view, though it will be rendered above the set up map). There are two labels in this screen to show the relation of the elevation. The top label indicates

the highest elevation the user has reached during the current track. The lower label indicates the middle of the elevation the user has reached. So the distance from the top to the lower label is as long as the distance from the lower label to the button. The bottom represents the lowest altitude the user has reached during the track recording. A common Elevation screen may look like the following:
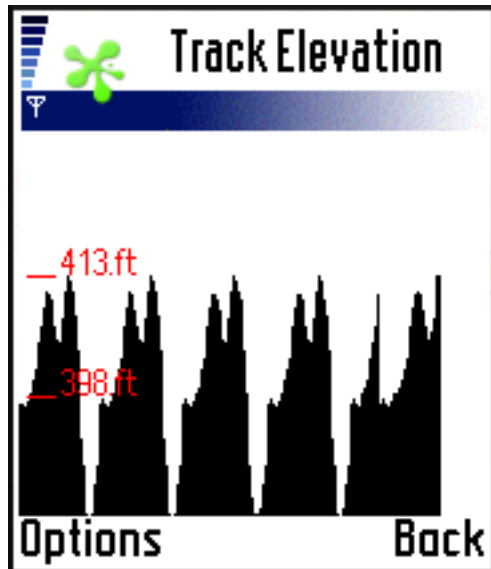
4 Troubleshooting

4.1 FAQ

Can I use Spot on my mobile phone?

Spot runs on virtually any phone which supports Java MIDP2.0/CLDC1.0. However, some mobile phones might not provide enough memory to use all features of Spot.

Where do I get the Java Environment needed for Spot?

Palm OS based PDAs require the IBM J9 VM for Palm OS.

Pocket PC based PDAs require the IBM J9 VM for Pocket PC.

Installation: Choose Linux and Windows there, log in and follow the directions until you reach the download page. Download the package matching your hardware. This should usually be the WebSphere Everyplace Micro Environment - MIDP 2.0 for Windows Mobile 2003 2nd Edition. Install the software as described in IBM's documentation.

Spot exits after some minutes. Why?

Spot is generally distributed as a demo version and will exit if the time limitation is reached. In this case, a message will be shown that the time limitation of the demo version is reached and *Spot* will exit. If you are not frequently using *Spot* you may miss this user info. However, you can start *Spot* again and if you have received a serial key from Skylab Mobilesystems or one of it's distributors you should register it. Though the limitation will not occur anymore.

4.2 Costumer support

Please send us an email with your questions or comments. We monitor all emails and will promptly reply to your inquiries.

Email: `info@skylab-mobilesystems.com`

5 Warranty

5.1 License

Copyright by Skylab Mobilesystems 2005, All rights reserved. *Spot* is subject to the Skylab Mobilesystems Software License Agreement. The full is version available at:
`http://www.skylab-mobilesystems.com/en/license.txt`

5.2 WMS usage

The containing Web Map Server configurationss for the mapped visualization (map screen) are example configurations. There is no relation between Skylab Mobilesystems and the service provider. Furthermore this configuration shall show how free accessable WMS services can be used within *Spot.* They are NOT part of it.

5.3 Using Spot while driving a vehicle

Keep your eyes on the street! If you are using *Spot* in a vehicle while driving it you should keep your eyes on the street. It is commonly known that distracted drivers cause more accidents than attentively ones.

5.4 Thrid party announcements

All rights of all announced trademarks, registered trademarks, products, images and symbols belong to their corresponding company.