



V0.4

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1 Introduction

eGPSTrack¹ is a gps tracking Java application for mobile devices with J2ME² and a Bluetooth , internal or serial gps receiver. It isn't a navigator, it is a positioning tool that tells you where you are at each moment, and which route you have been travelling. It is primarily aimed at outdoor activities such as trekking, hiking and cycling

eGPSTrack can load calibrated maps (cartographic or satellite images), and show your current track, position and direction on the map, providing you a global view of your trip. Old tracks can be loaded and showed at same time as your current track. Tracks can be exported to GPX and KML files so that you can view and edit them on a computer.

Thanks to all the people who help me, with its support, commentaries, suggestions and test: Stephen D., Erik J., Marcelo C., Frank K. , Aleksandar K., Martin V., Josep G., Anders L., Helena B., Mariano F., Bert S., Asger M.

1.1 System requirements

A device with J2ME³ run-time platform which must have the next specification:

- MIDP 2.0 / CLDC 1.1 with enabled APIs :
 - JSR-135 (Media Package)
 - JSR-82 (Bluetooth Package)
 - JSR-75 (File Access Package)
 - JSR-179 (For devices with internal GPS)

1.2 Installation

Use the normal procedure to install Java applications on your device. To install *eGPSTrack* on a Nokia⁴ terminal, for instance, use PC Suite⁵. Depending on the device, you may have to adjust the permissions that are granted to *eGPSTrack*. In particular, *eGPSTrack* must be granted permission to access Bluetooth connections and to access the file system. This is important because *eGPSTrack* may not work correctly if its permissions have not been configured correctly. Consult the user manual of your device how to configure the permissions of Java applications.

Because *eGPSTrack* is not signed—and therefore has not been verified by a third party—your device may ask for permission whenever *eGPSTrack* needs to open a Bluetooth connection or needs to access a file (when it stores a track or loads a map, for example).

1.3 Keypad

eGPSTrack uses the generic key bindings in the figure.

On-screen button execution:

¹<http://egpstrack.hlod-wig.org/>

²<http://http://java.sun.com/javame/index.jsp>

³<http://http://java.sun.com/javame/index.jsp>

⁴<http://www.nokia.com>

⁵<http://europe.nokia.com/A4144903>



Figure 1: Key Bindings

- Button '1' : Executes “left button”.
- Button '5' : Executes “center button” (Fire button).
- Button '3' : Executes “right button”.

Cursor movement:

- Button '2' : Moves up.
- Button '8' : Moves down.
- Button '4' : Moves left.
- Button '6' : Moves right.

Miscellaneous options:

Depending on the screen that is displayed, you can activate additional functions by pressing the keys '7', '9', '*', and '0'. See the next sections for detailed documentation.

Some devices have special keys for moving the cursor and for performing special functions (hang-up, call, etc...). *eGPSTrack* tries to use these keys in an intuitive way, but this may not always work correctly. In this case you can use the numeric keypad as explained above.

1.4 Help on-screen

The ' #' key is programmed to show a help text related to the current screen. Use it if you don't remember the available keys or functionality provided. See the figure for an example.

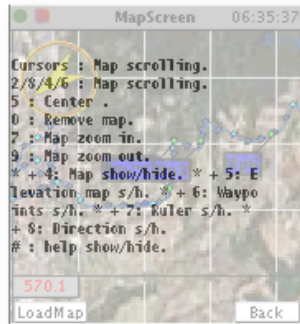


Figure 2: Help Screen

2 The Main screen

When application is launched, is showed the *Main Screen* with a list of available options (*Configuration, GPS, Tracks ..*) .You can select an option with the cursor keys and then press the Fire button to activate that options. This will open a new screen that is described in one of the following sections.

All screens, including the Main screen, display a status bar at the top (see the image). The left-most icon in the status bar indicates the GPS connection status: a green circle indicates that a connection has been established, and a red circle indicates otherwise. The second from left icon indicates the track logging status:

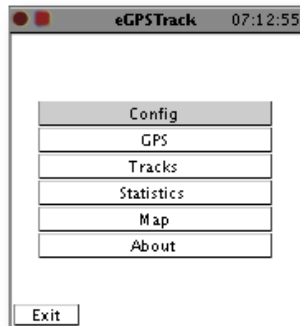


Figure 3: Main Screen

- A Red square : No track logging enabled.
- A green triangle : Track logging in progress.
- Two red columns: Track logging paused.

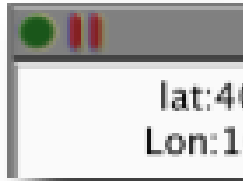


Figure 4: Status icons

3 The Configuration screen

The Configuration screen enables you to set parameters that control the behaviour of *eGPSTrack*. After launching *eGPSTrack* for the first time, you must enter this screen and specify at least the GPS receiver to be used and the name of the default folder (directory) where the track and map data are to be stored. Setting the other configuration parameters is optional.

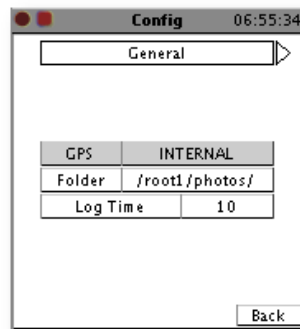


Figure 5: Configuration Screen

3.1 GPS

Select the *GPS* option to select and configure the *GPS* receiver that is to be used. The current version of *eGPSTrack* supports Bluetooth, internal and serial GPS receivers.

- *Bluetooth* : To use a Bluetooth, first make sure that Bluetooth is switched on in your device and that *eGPSTrack*⁶ has been granted permission to use Bluetooth connections. Select the menu option GPS / bluetooth , press Search “ button and wait some time for a list of detected Bluetooth devices. Use cursors to move to the desired device and select it pressing 'use' button. You will then return to the Configuration Screen⁷ where the name of the *external GPS* will

⁶<http://egpstrack.hlod-wig.org/>

⁷documentation

be displayed.

- *Internal* : To use an internal GPS receiver, select the menu option GPS / internal. Note that an internal receiver can only be used if the J2ME⁸ run-time platform on your device includes the optional package JSR-179. Also note that support for internal GPS receivers has only been recently added to *eGPSTrack*, so this feature could be unstable.
- *Serial* : To use a serial connected *GPS* receiver, select the menu option GPS / Serial. You must enter some connection parameters, including the port name and the communication speed. For instance, when using the HGE-100⁹ (tested on *eGPSTrack*¹⁰) you must specify 'at5' as the port name and 9600 as the communication speed. Check the manual of your *GPS* device to obtain the correct settings.

3.2 Folder

Select the Folder option to choose a folder (directory) in which track logs will be stored. This folder will also be used in Map Screen¹¹ to **load maps**. *eGPSTrack* has a built-in file browser (see image below) for navigating through the file system and for selecting files and folders.

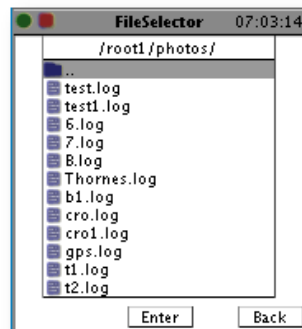


Figure 6: File selector

3.3 Log time

Select the Log time option to set the frequency with which *eGPSTrack* writes *GPS* position samples to the track log file. To be precise, this option specifies the time in seconds between each two consecutive position samples that are written to the log file. You will have to adapt this parameter to the expected speed with which you will be travelling. For instance, if you are travelling by car, a 60-second log time interval will result in a poor track resolution. If you are travelling on foot, on the other hand, a 1-second interval will generate a track log with a lot of similar points.

⁸<http://java.sun.com/javame/index.jsp>

⁹<http://www.sonyericsson.com/cws/products/accessories/overview/hge-100>

¹⁰<http://egpstrack.hlod-wig.org/>

¹¹documentation

3.4 Transparency

Use the Transparency option to determine how *eGPSTrack* should draw some graphics with a transparency factor. The option may slow down the screen updates, especially on slower devices. Disable this option to speed up the screen updates.

3.5 Units

Use the units option to change the units used for reporting distances and velocities. This option also determines the units in which tracks are exported.

3.6 Display Type

Information showed in *GPS* screen or *Statistics* Screen can be displayed using simple text or by means of numbers drawn simulating a *LCD* display.

4 The GPS screen

The GPS screen shows the data currently obtained from the GPS receiver, including your current position, altitude, speed and direction; see the image below. Pressing the Fire button starts or stops the reception of GPS data.

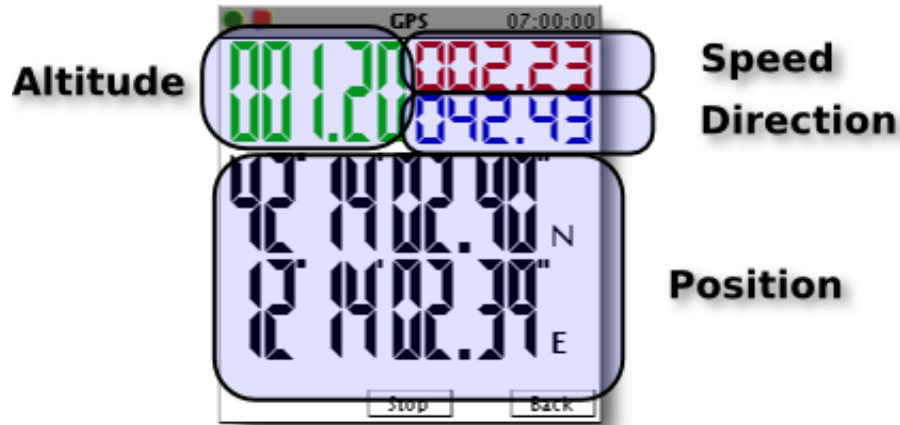


Figure 7: GPS Screen

The displayed data are obtained directly (that is, without further processing) from the NMEA183¹² information sentences received from the GPS receiver. *eGPSTrack* tries to use the quality values provided by the GPS receiver to ensure that the displayed data are correct. In spite of this, however, erroneous data may be displayed in some occasions. Improving the robustness of *eGPSTrack* in this respect is an important aspect of the ongoing development.

This screen supports the following extra key bindings:

- **Key Star** : Insert waypoint with current position into the current track. A name is asked before the waypoint is written to the track log. This key only has effect if a track is active.

¹²<http://www.kh-gps.de/nmea.faq>

5 The Statistics screen

The Statistics screen shows information about the active and loaded tracks. This information includes the total distance, the accumulated ascended and descended distance, the average speed (excluding the time that the speed was zero) and the accumulated average speed (equal to the total distance divided by the total elapsed time). With the **left** / **right** cursor keys you can cycle through the loaded tracks.

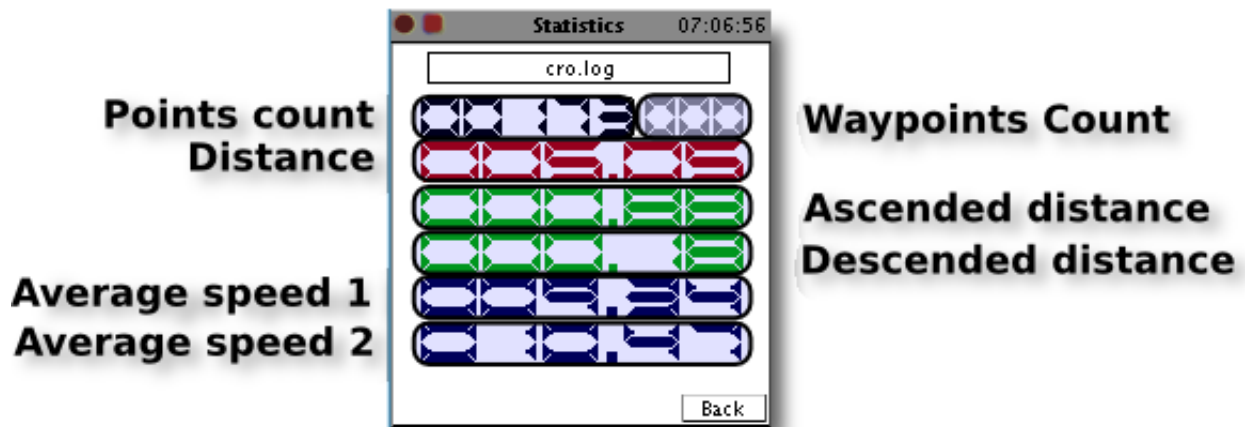


Figure 8: Statistics Screen

As shown in the image, the accumulated average speed can sometimes be larger than the average speed. The reason for this discrepancy is that the accumulated average speed is computed from the position information and the elapsed time, while the average speed is computed from the velocity information obtained from the GPS receiver. In particular, *eGPSTrack* properly accounts for differences in altitude when computing the total distance, while the GPS receiver may omit altitude changes from the velocity information that it provides.

6 The Tracks screen

The Tracks screen enables you to manage tracks. You can create new tracks, load old tracks, unload tracks and export tracks. Track logs are stored in the NMEA183¹³ format, and they can be exported to *GPX* and *KML* files; see Export Section¹⁴ for more information. You can use the program GPS Babel¹⁵ to convert a track to other formats.

Track log files are created with the name given at the moment of creation. eGPSTrack¹⁶ doesn't perform any checks if a file exists, so be careful not to overwrite an existing file unintendedly. Track logs will be created inside the folder configured in Configuration Screen¹⁷.

6.1 New

Select the New option to create a new track log. After you have entered the name of the log, a new file will be created. The icons in status bar, will notify you about status changes; once new track has been created, a green icon will be displayed. From this moment, when a connection has been established with the GPS receiver, information will be stored in the track log and the track statistics will be updated with the configured rate. Pressing the the Star key in the Tracks screen will pause the capture of position information. To stop the capture permanently, you must unload the track (see below).

6.2 Load

Select the Load option to load an old track log. It is possible to load a track log generated by another program, as long as the track log is stored in the *NMEA183* format.

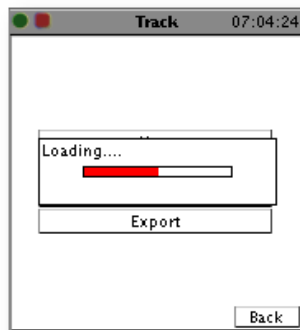


Figure 9: Track Loader

¹³<http://www.kh-gps.de/nmea.faq>

¹⁴documentation

¹⁵<http://www.gpsbabel.org>

¹⁶<http://egpstrack.hlod-wig.org/>

¹⁷documentation

6.3 Unload

Select the Unload option to unload a track and remove all related data from the working memory of *eGPSTrack*. This option will **not** delete any track log files stored in the filesystem.

6.4 Export

Select the Export option to export a track log to another format. The supported formats are:

Currently supported formats are:

- GPX¹⁸ : A standard format used by by the majority of commercial GPS devices and desktop applications.
- KML¹⁹ : A format used by Google Earth. Note that a *KML* file contains altitude information that can be visualized by Google Earth.

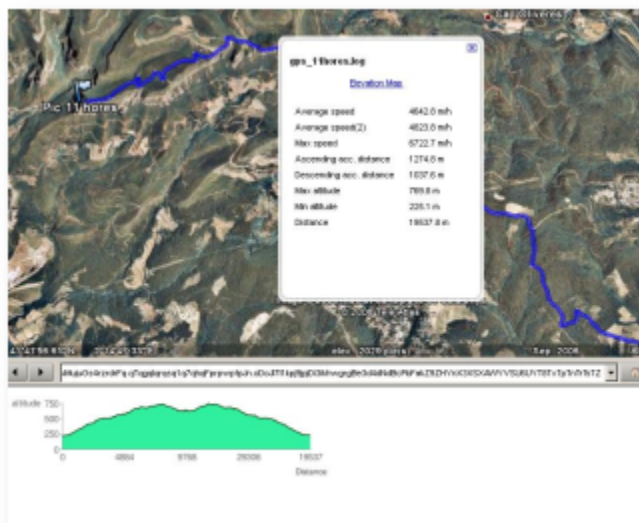


Figure 10: Google Earth Visualization

¹⁸<http://www.topografix.com/gpx.asp>

¹⁹<http://earth.google.com/>

```
eGPSTrack-0.4
garriga.jpg
41.68645 N, 2.2920 E
41.68045 N, 2.3000 E
```

Figure 11: eGPSTrack map sample file

7 Maps

7.1 Calibration

eGPSTrack²⁰ has its own format for calibrated maps, you can use the online eGPSMap generator²¹ to generate them, but if you already have raster maps, you can manually convert them to a file that can be read by *eGPSTrack*. The format of this file is straightforward, as illustrated in the following figure.

First line must be the literal ' *eGPSTrack-0.4* '.

The second line must contain the file name of the map image²².

Next two lines contain calibration data: the coordinates of the upper-left corner (in the example " *41.68645 N, 2.2920 E* ") and the lower-right corner (" *41.68045 N, 2.3000 E* "), respectively. The coordinates must be specified in the *Decimal degree* format.

Note that the file must have the extension " *.egt* ".

Application doesn't implement automatic Datum²³ conversions. Map calibration and *GPS* device must be in the same Datum²⁴, generally WGS84²⁵. If configuration of *GPS* differs, information shown in application (like distances) will be erroneous.

7.2 Map Screen

To view maps and the active tracks, select button Map on main menu. In this screen, left buttons are enabled to load egt files²⁶, click it and select the desired file, once selected, map will be shown, remember that in this version, in some devices, you may be asked some times for grant permissions over filesystem access. Currently, loading is performed without any progress bar, please be patient because, depending on image size, loading could take some time.

In this screen, the tracks are drawn with points, the color of each one will change to inform about direction of track. On upper-left corner an arrow will show the actual direction. On upper-right corner, the list of track will inform, with its color, which track is which.

The extra controls available in this screen are :

²⁰<http://egpstrack.hlod-wig.org/>

²¹<http://egpstrack.hlod-wig.org/maps.html>

²² \emph{PNG}, \emph{JPG}, \emph{GIF} image types are supported. The size of the map is restricted by the available memory in the \emph{Device}, on a \emph{Nokia 6230i}, where this application has been tested, maps larger than 800x600 are loaded without problems. On a \emph{N70} images with a size of 1024x1024 can be used satisfactorily.

²³<http://en.wikipedia.org/wiki/Datum>

²⁴<http://en.wikipedia.org/wiki/Datum>

²⁵<http://en.wikipedia.org/wiki/WGS84>

²⁶documentation



Figure 12: Map view

- Direction buttons : To scroll the image.
- Key **5** : To center the image and tracks.
- Key **7** : To zoom in the image.
- Key **9** : To zoom out the image.
- Key **star** + **4**: To enable/disable raster image loaded.
- Key **star** + **5**: To enable/disable Elevations's Map²⁷
- Key **star** + **6**: To enable/disable Waypoints labels.
- Key **star** + **7**: To enable/disable ruler.
- Key **star** + **8**: To enable/disable needle.

When the ruler is enabled, a grid is drawn, and the distances between lines are informed by the bottom-left number.

Currently behavior implemented to center tracks doesn't performs zooms, for this reason, perhaps after press **5** no tracks are showed, in this situation, zoom-out key **9** must be pressed, because track is centerer but outside of view due current zoom level.

7.3 Elevation Map

In Map Screen²⁸, when combination *star* + **5** are pressed, the Elevation map is shown or hidden.

The graph is painted with the altitudes logged in each track. If more that one track are loaded, you can move beetwen its elevation maps pressing left or righth scroll buttons. In the middle of elevation map, a label will show the name of current track displayed.

Graph shows altitudes proportionally to height of displayed box, minimum level is set at 0 (sea level)

²⁷ documentation

²⁸ documentation

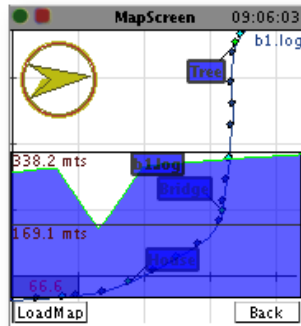


Figure 13: Elevationmap 1

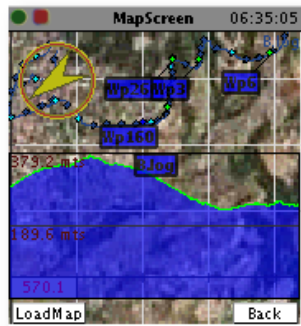


Figure 14: Elevation map 2

8 Waypoints

It's possible to insert waypoints manually in current trekk logging, by means of pressing key **Star** in GPS screen²⁹, the waypoint will be inserted in log file using current position provided by GPS. Application will ask for a name for the point. This name is showed in Map Screen³⁰ (with the combination **star** + **6** labels can be enabled or disabled)

²⁹documentation

³⁰documentation

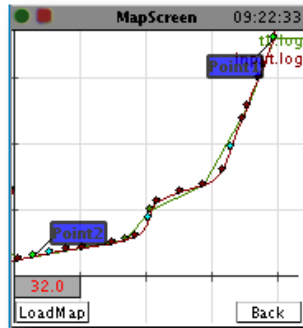


Figure 15: Waypoints view

9 Contact

For any question, doubt or suggest, please ,

- Contact with author: egpstrack@gmail.com
- Or subscribe to **eGPSTrack** discussion group: <http://groups.google.com/group/egpstrack>