GPS ESSENTIALS

Manual

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Covers Version 4.3.17

Welcome

Welcome to GPS Essentials, the swiss army knife of GPS navigation on your Android phone. This document gives you a brief overview of what you can (and cannot) do with GPS Essentials. You will rarely find step-by-step instructions here. Please also have a look into the help pages available within the app if you run into problems.

When we started with GPS Essentials, Android was the new kid on the block and we wanted to see how cool it really is. So we put together a satellite sky view, a map and a waypoint database and called it GPS Essentials. Both Android and GPS Essentials grew up since then and while Android starts to dominate the mobile phone market we proudly present what we believe is the most universal GPS tool that you can get for your mobile device.

GPS Essentials is used by pedestrians, car drivers, motocyclists, mountainbikers, geocachers, pilots, geologists, sailors, truckers, farmers, fishermen, just to mention a few. When we receive feedback from our users we notice that they all have their specific requirements and demands. Still, we believe if you want to get from A to B then GPS Essentials can do better than most specialized apps.

This effort to write a guide to GPS Essentials comes from many user requests asking for more information than is accessible in the in-app help. This document is still in early stages but we thought it is already useful for users that are new to GPS Essentials and who are a bit overwhelmed by its complexity.

Get Familiar With Android

We are not teaching you how to use Android based phones and tablets but we will assume that you know how to handle your device. For example, when you export data to a file on your device, you have to know how to copy the file to a different location, such as your desktop computer. If you are an Android beginner, please take some time to dive into Android before you start using GPS Essentials.

GPS Essentials is one of the complex apps. Most apps deal with one specific thing and they do it well. If you have an app to find your car where you parked it, you will probably learn how to use this app while you are using it for the first time. You can also find your car with GPS Essentials, but things will be less intuitive. On the other hand, you can save the parking lot and get back there the next time you drive downtown.

About This Manual

The intention of this manual is to give you detailed background information about the internals of GPS Essentials to unveil it's full potential and at the same time let you quickly find a way to perform common tasks. Bear with us, this is not easy.

If you are interested in step-by-step instructions on a specific task, look for the symbol.

 As all good manuals, this document is work in progress. In most situations it's better to have an incomplete manual than no manual at all, and so we released this one while some sections look like an early draft.

Support

If things are not working as you expect, you can ask for help. Visit www.gpsessentials.com to check the latest information. You can navigate to our Facebook Page from there, download software and be part of the GPS Essentials community. There is a discussion forum on groups.google.com/group/gpsessentials where you can comment, request new features and ask for help.

If you need a personal word, the easiest way is to send an email to support@mictale.com. We'll try to respond as soon as we can, please understand that we cannot guarantee response times.

Training Videos

GPS Essentials has it's own video channel on Youtube. Visit youtube.com/user/GpsEssentialsApp for a set of brief screencast shows.

Installation

The quickest way to install GPS Essentials is to scan the following QR-code with your device:

market://details?id=com.mictale.gpsessentials
https://play.google.com/store/apps/details?id=com.mictale.gpsessentials

The link will open the Google Play app on your phone so that you can download and install GPS Essentials with a few taps.

You can also download GPS Essentials from http://www.gpsessentials.com but this is only recommended if you don't have access to Google Play or if you want to download versions other than the stable release such as older versions or the latest beta.

If you are installing GPS Essentials from Google Play, you will receive updates as soon as they are available. If you downloaded GPS Essentials from a different source, you might have to care about updates yourself. The latest version of GPS Essentials usually contains important fixed, please ensure that you have the most recent version.

Database

GPS Essentials stores information in a database on your SD card and in application preferences. The database holds all objects that are relevant for navigation such as waypoints, tracks, routes, tags

and messages. Since the database file resides on your SD card, GPS Essentials will not run while the SD card is mounted to your desktop computer.

The database is in the folder `com.mictale.gpsessentials/databases` in the root of your SD card. You can copy this file to a different location to make backups of your data.

Start Screen

You see the start screen when you start the app. It contains icons to access all features of the app.

Some of the icons are related to data that GPS Essentials stores in its database. GPS Essentials handles waypoints, routes, tracks, pictures, messages and tags. Each of these data types has an icon associated with it so that you can see the elements, add new and delete existing. If you want to know more about these element types, refer to the appropriate section below.

The other icons are related to concepts that deal with more than one element type at a time or that does not store data.

We'll run through the features that are behind every icon in the course of this document.

If GPS is disabled on your device, you will notice a yellow banner warning. The banner has a link that you can tap to get directly to the system settings page to enable GPS.

Activities

GPS Essentials, as most other Android apps, separates its workflow into activities. Every activity has its own user interface screen. You start an activity by pressing a button or selecting a command from a menu. When you are done, the activity will finish and your previous activity will appear again. Use the back button to finish an activity at any time.

Think of the activities as a stack of cards: Every time you open a new activity, it will be pushed onto the top of the stack and you can work with it. When you are finished, the activity will be popped from the stack and you see the activity below it.

Pressing the back button ends the current activity and brings you back to the previous one. The icon in the top-left corner of the screen opens the parent activity and navigates "up" in the hierarchy of activities. For example, if you are in some waypoint details, the parent will be the list that contains the waypoint. The parent activity is not always the activity where you came from.

Domain Model

GPS Essentials features a location based database that stores all your data into hierarchical streams.

Everything you store in GPS Essentials will end up in a so called stream. For example, when you are tracking your current location, GPS Essentials will append your current location to a specific stream every few seconds. When you are taking a picture, GPS Essentials will collect the image data, your location and the device orientation and append this data to a stream.

Streams are much like files in a text processing application. You can create, edit, share and delete them and the data that you create will reside in one and only one stream.

The things that you store into a stream are called "nodes". A node can be anything from a simple latitude-longitude pair to a picture.

Categories

You can create *categories* within a stream to structure your data. The categories of a stream build a hierarchy so that every category has a parent and optional child categories. Every node is a member of one and only one category. Think of categories as the sections and chapters of a book.

Nodes are ordered within a category. New nodes will append to the end of the category so that categories are initially ordered by time. You can drag nodes to a different position within a category to reorder the nodes. Notice that changing the sort criteria will not affect ordering, it will only present the nodes of a category in a different way. Order manifests in the database while sorting is a (volatile) presentation feature.

Styles

Categories can style the nodes they contain. Styles are a set of attributes that tell GPS Essentials how to draw the nodes and set a line style to connect the nodes.

A style also defines the type of the category. The type of a category not only controls how the category will appear on a map, it will also tell GPS Essentials how to handle this category and it's stream in various situations.

You can choose between the following stream types:

Style	Description
None	No style defined for this category
Sequence	A generic sequence of nodes
Route	The nodes are routing targets, an optional child polyline contains the track line.

Style	Description
Track	The nodes are a sequence of recorded locations.
Polyline	The node are points of a polyline
Polygon	The nodes are points of a polygon
Slippy Map	The nodes are map tiles of a sloppy map
Assets	The nodes contain internal data such as icons

The last two types are used internally by GPS Essentials.

Stream Type

The types of categories that are contained in a stream also define how the stream appears overall. GPS Essentials will apply the following rules in order to determine the stream type.

Containing Types	Stream Type
Tracks and routes	Mixed
Tracks but no routes	Track
Routes but no tracks	Route
Maps	Map

Granularity

GPS Essentials gives you a lot of freedom when it comes to how you structure your data. You can put all your data into a single giant stream or you can work with many small streams.

For example, you can create a new stream for every route you create, but you could also decide to add multiple routes into different categories of a single stream.

Here are some thoughts about the impact of the level of granularity you choose:

You can only share entire streams: Streams are the smallest unit you can share. If you share huge streams, uploading and downloading all the stream data will take considerably longer. Also, you

probably don't want to share all data in a specific scope. If you create many small streams, you will have to share them one by one.

You can only star entire streams: Starring is a good way to make a stream visible on all maps. However, this will make the entire stream visible. If you have large streams, this will add many items to your map. If you create many small streams, you will have to star and unstar them one by one.

Dashboard

This is a fullscreen area to place widgets that show you navigation information, such as your current speed or the distance to the next waypoint. You can configure which navigation values to show. Other views such as Compass and Map also show these values.

When you open the dashboard for the very first time, it is empty. Tap on any free cell and a dialog pops up. Select one of the elements and a small widget will be placed on the free cell.

Some of the widgets will show values immediately. Some others requires you to start a route first or they need a valid GPS fix to work properly.

Once you added the first widget, you'll notice that the actual dashboard is much larger than the screen and you can swipe the visible window on the full dashboard to make other cells visible.

If you want to move a widget to a different cell, tap and hold it. Once you notice a little buzz (if haptic feedback is enabled in your system settings), you can drag it to any other cell. You can also drag it to the trash can that appears once you started moving a widget.

You can tap on widgets to see some more information. Some widgets can be configured this way.

The contents of the widget are color-encoded: Yellow means the information is probably outdated or inaccurate. For example, the information is based on a GPS fix which is too old or the information is derived from a network location which is not very accurate. If the contents are white, then the data is up-to-date and accurate.

Here is a list of all available widgets:

Name	Description
Stop Watch #1	A count up timer that can be paused, resumed and reset.
Stop Watch #2	A count up timer that can be paused, resumed and reset.
Battery Level	The percentage of remaining battery capacity.
Battery Temperature	The temperature of the battery.
Battery Voltage	The voltage of the battery.
Number of Satellites	The number of satellites in view and the number of satellites considered for the latest fix.

Name	Description
Declination	The declination of the horizontal component of the magnetic field from true north, in degrees (i.e. positive means the magnetic field is rotated east that much from true north).
Speed	The horizontal velocity over ground.
Pace	The horizontal pace over ground, the reciprocal of velocity.
Course To	The direction from the current location to the target in degrees east of true or magnetic north, depending on your bearing settings.
Course From	The direction from the target to the current location in degrees east of true or magnetic north, depending on your bearing settings.
Turn	The angle between bearing and course. Turn left for negative values.
Tracking Speed	The velocity towards the tracking angle over ground.
True Speed	The velocity towards the target over ground.
Average Speed	The average velocity over ground.
Max Speed	The maximum velocity over ground.
Min Speed	The minimum velocity over ground.
Bearing	The direction of travel in degrees east of true or magnetic north, depending on your bearing settings.
Reverse Bearing	The reverse direction of travel in degrees east of true or magnetic north, depending on your bearing settings.
Time	The current time of day as reported by the GPS receiver. The time is in the local time zone.
UTC Time	The current time of day as reported by the GPS receiver. The time is in UTC.
Date	The current date.

Name	Description
Altitude	The altitude above (or below) main sea level. (Prior to Android 2.0, this value is relative to the WGS84 ellipsoid).
Max Altitude	The maximum altitude above (or below) main sea level.
Min Altitude	The minimum altitude above (or below) main sea level.
Accuracy	The precision of the current fix as reported by the GPS receiver. Lower values indicate better reception. The more satellites are in view, the better this value will be.
Latitude	The latitude of the current fix.
Longitude	The longitude of the current fix.
Position	The coordinates of the current fix, either latitude and longitude or UTM.
Location Provider	The provider of the current location: Cell, Wifi or GPS.
Target	The latitude and longitude of the target. You can pick a new target or select one from the waypoint list.
Target Altitude	The altitude of the target. You can pick a new target or select one from the waypoint list.
Target Slope	The gradient between the current location and the target in percent. Positive values indicate ascending slope, negative descending. You can pick a new target or select one from the waypoint list.
Target Name	The name of the current target. You can pick a new target or select one from the waypoint list.
Distance	The distance between the current position and the target.
ΣDistance	The distance between the current position and the end of the running route.

Name	Description
Distance Covered	The distance traveled while GPS Essentials is in the foreground or tracking. You can reset this value.
Trip #1	A trip counter that measures distances and can be reset.
Trip #2	A trip counter that measures distances and can be reset.
Distance To	The distance between the current position and an arbitrary position. You can reset this value to select the current location.
Climb	The vertical velocity.
Altitude Made Good	The vertical distance between a starting point and the current position. You can reset this value to select the next received location as the new starting point.
Altitude To Go	The vertical distance between the current location and the target location.
TTG	The estimated time to go to the target.
∑TTG	The estimated time to go to the end of the route.
ETA	The estimated time of arrival at the target.
∑ETA	The estimated time of arrival at the end of the route.
Tracking Angle	A general purpose azimuth angle to track.
Sunrise	The local time of today's sunrise.
Sunset	The local time of today's sunset.
Moonrise	The local time of today's moonrise.
Moonset	The local time of today's moonset.
Moon Phase	The moon phase indicating the \'age\' of the moon. A cycle of the moon lasts 29.530588 days, starting and ending with new moon. The moon is presented as it shows up on the northern hemisphere. Down Under, stay tuned.

Camera

Shows a HUD (head up display) of your waypoints. You can also shoot images.

The HUD displays waypoints so that you can match them with landmarks. When a waypoint is close to the direction of view, additional info appears on the left side of the screen.

Directional indicators show you how the device is oriented: The compass shows the current azimuth angle. The vertical pitch scale has 5° units and the intersection with the direction of view indicate the current pitch angle. The roll scale rotates and you can read off the current roll angle at the triangle.
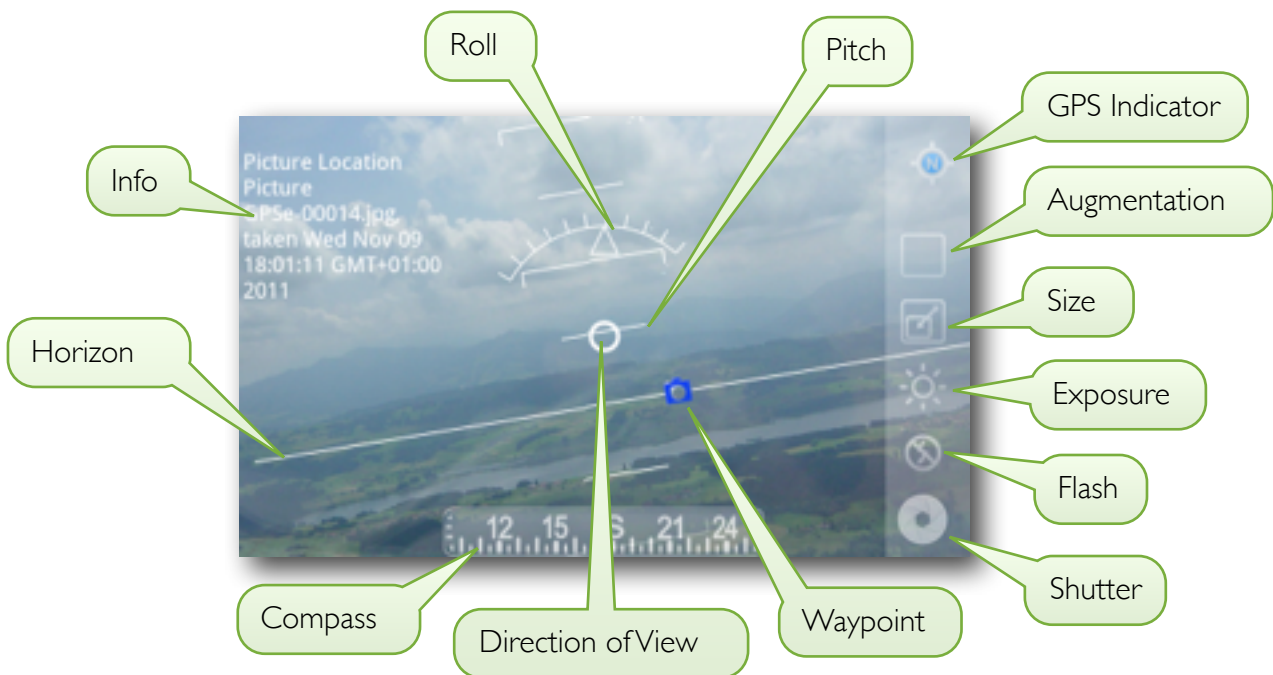
The toolbar controls the camera. The GPS indicator tells you which location provider reported the current location. It is N for the network provider and G for the GPS provider. The provider is relevant for the image's location and you might want to wait for the GPS provider to get a more accurate location.

The augmentation tool lets you switch between augmented and plain image. When you switch on augmentation, then the directional indicators will be rendered onto the saved image.

The size tool lets you change the size of the image on disk. Large images consume a lot of memory. When augmentation is enabled, you need twice the size of the uncompressed image in RAM. If you receive messages telling you that you ran out of memory, reduce the image size.

The exposure tool lets you increase and decrease the exposure time.

The flash tool lets you change the flash mode.

The shutter button triggers capture of a single image. After the image has been captured and processed, you will see an iconic view of the image in the lower left corner. Tap on the image to switch to the pictures view.

Compass

An orienteering compass that shows magnetic north, the direction to the next waypoint and a few widgets from your dashboard.

The dashboard is below or on the right side of the compass, depending on the orientation of the device. The dashboard works exactly as the main dashboard and it shows the same widgets. Please refer to the section about the dashboard above for a detailed description.

The compass features a rotating scale, an adjustable scale and a direction indicator. Having a rotating scale means that there is no compass needle, but the scale is rotation so that N always points north. You read out the current heading angle at the top end of the thin orange vertical line.

There is a secondary outer scale that is clamped to the rotating scale. You can drag the outer scale to rotate it to a different orientation. To rotate the outer scale so that it is aligned with the orientation of the device press the Align Scale button. = on the outer scale will then point into the direction you hold the device.

The direction indicator points to your current target. Use the Target Select button to change the target quickly.

The bottom edge of the screen has a small handle that you can drag up to get to the display options: You can switch the compass between magnetic and geographic orientation and you can switch to a marine compass. This is an alternative design of the outer scale optimized for sailing boats:
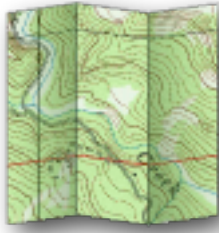
Portable Maps

Shows your waypoints, routes and tracks on a map from various data sources.

This view shows your waypoints, tracks and routes on top of a map. New map data loads from the internet while you zoom and pan the map. All downloaded data will be stored on your SD card for offline use. You can configure the amount of storage available for the cache in settings.

The Map

To pan the map, tap and hold the map and then swipe your finger to any direction. To zoom the map, pinch it with two fingers.

Cursors

You use cursors to interact with the map. You can either place cursors onto items on the map, such as waypoints or track or route elements or you can place a cursor on an arbitrary location. To create a new cursor, long press somewhere on the map until the cursor appears. Now drag your finger to move the cursor. As soon as the cursor detects an item under it, the cross lines will move onto the item.

There is one active cursor which is bolder than the others. You can have a maximum of 3 cursors, when you attempt to create the fourth cursor, the oldest cursor will be used instead.

The Toolbar

The map's toolbar is for page navigation, shows the info pane and the search icon. looks The toolbar is divided into 3 sections:
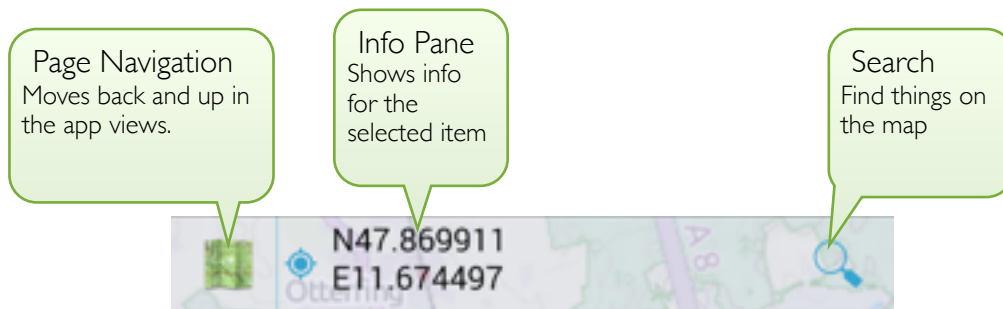
The page navigation brings you back to the start screen of GPS Essentials. When there is a pending operation on the toolbar, such as a search, tapping on the icon cancels the operation.

The info pane shows information about the item under the active cursor. When you tap on the info pane, it shows a list of all available aspects. Tap on an aspect to load it into the info pane.

Icon	Name	Description
Ab	Name	The name of the selected item, e.g. the name of the waypoint, route or track.
◉	Location	The location or the item or the plain cursor when there is no selected item.
↑	Altitude	The altitude of the item.
◷	Time	The time of the item, e.g. the track time for a track element.
⛰	Target	The distance and bearing from the previous cursor location to the current cursor location.

Dial Menu

You use the dial menu to run map commands. The dial menu is located at the bottom right corner of the map. It has it's name from the rotary dial, a long gone input device.

In its initial state, the dial menu is collapsed to a small disk. Tap on it to expand. The dial menu has two rings, the inner ring shows command categories and the outer ring shows commands. You can rotate both rings to show hidden icons. When you tap on an icon on the inner ring, the outer ring rotates to show the command icons of this category.

Below is a list of all commands. Some of the commands are only available when you created a cursor over an existing element (Long tap and drag the cursor until it lock onto an element):

	Edit	**Commands to change the nodes under the cursor or add new nodes**
	Edit	Opens the selected element for editing. This is the same as tapping on an element in list view
	Add	Adds a new node under the current cursor. The element will have the default icon, use edit to change it's properties
	Contacts	Find a contact and adds a location for it (Requires the free contacts plugin)
	Mark	Marks the element under the current cursor. This is same as marking in edit node. You can then copy or move it to a different stream
	Remove	Removes the element under the current cursor
	Chart	Show the chart of the selected element's category
	Export	Exports the selected element's stream
	Bulk Download	Loads all map tiles for the current viewport. Only supported on Mapquest maps.

	View	**Commands to change the presentation of the map**
	My Location	Pans the map to show the current location an keep centered while moving
	Zoom In	Zoom the map in
	Zoom Out	Zoom the map out
	Zoom All	Zoom to show all contents of the current stream.

	Zoom Leg	Zoom to show the current location and the current target
	Map	Select a different map. The map will be saved for the current stream

	Navigate	Controls route navigation
	Start	Navigate to the selected target
	Previous	Navigate to the previous target
	Pause	Suspend navigation
	Next	Navigate to the next target

	Playback	Controls track playback
	Play	Stars playback at the selected element
	Pause	Suspend playback

	More	Shows miscellaneous commands
	Help	Shows the help page for the maps view
	Settings	Shows app settings

Create a new waypoint

1. Tap and hold on the map to create a new cursor.

2. Now drag the cursor onto the location where you want the new waypoint.

3. Tap on actions to show the actions pane.

4. Select the add tool ⊕ to create the waypoint.

🖼 Measure the distance between two waypoints

1. Place a cursor onto the first waypoint

2. Place another cursor onto the second waypoint.

3. If the search or tools pane is active, tap on page navigation to cancel.

4. Tap on the info pane and select the target aspect.

5. While you are dragging the cursors, the info pane will keep its values updated so you can make successive measures quickly.

Dashboard Split View

In the previous examples in this section we did not mention the part of your screen that shows a portion of the dashboard. Your screen is actually divided into a section that shows the map and a section that shows the dashboard.

Here is a split view that shows map and dashboard in both portrait and landscape oriented screens:
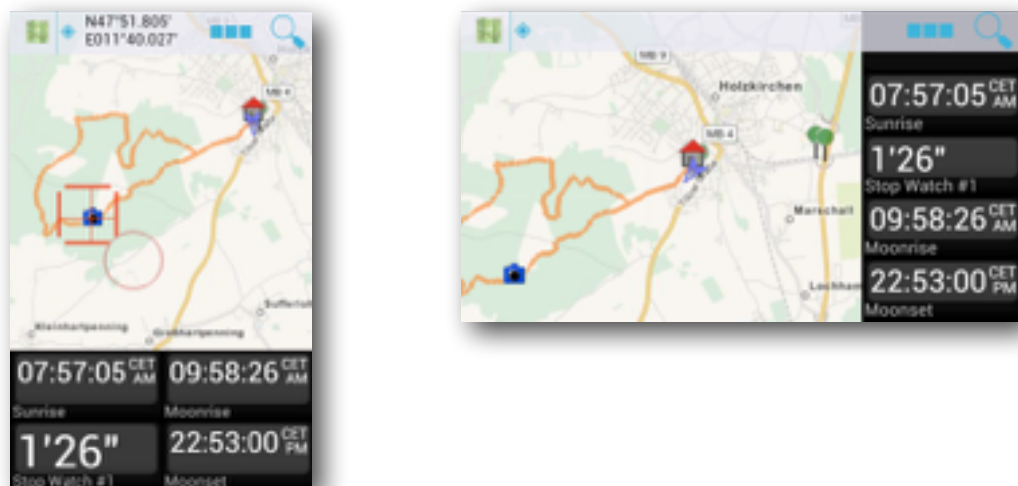
There is an invisible divider bar between the map and the dashboard. When you tap onto the border between the map and the dashboard, the divider will become visible and you can drag it to make more room to either the map or the dashboard.
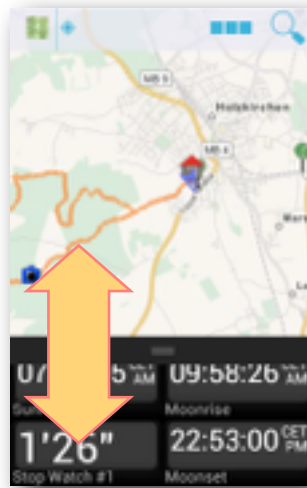
Google Map

A multi-layer map display that shows all your waypoints, tracks and routes.

The map view is probably the most versatile and complex view of GPS Essentials. It has a different layout in horizontal and vertical oriented screens and features a multilayer map 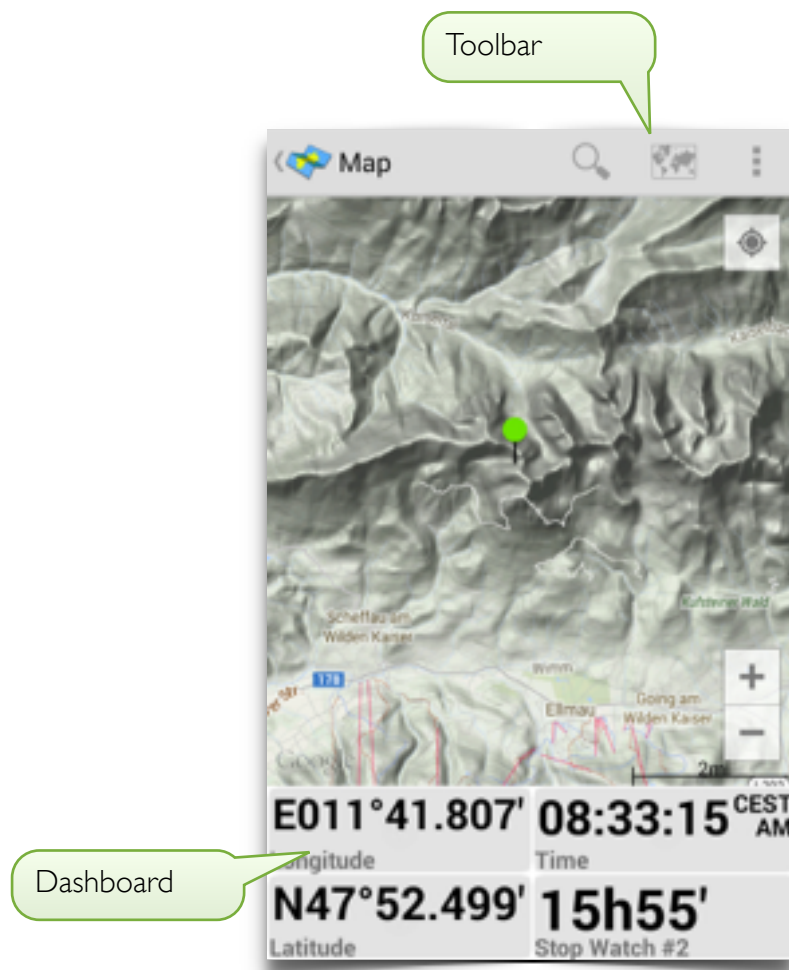and a dashboard. The dashboard works exactly as the main dashboard and it shows the same widgets. Please refer to the section about the dashboard above for a detailed description.

Toolbar

Dashboard

You can adjust how much space you want to use for the map and the dashboard by dragging the slider up and down (or left and right on horizontal screens). The slider appears when you tap on the screen near the separation between the map and the dashboard. You can drag the slider all the way down until the dashboard is completely hidden and you can also drag it all the way up to hide the map completely. Doing so can make it hard to find the slider again, remember that the map is always above the dashboard, even when it is hidden.

The Map

To pan the map, tap and hold the map and then swipe your finger to any direction. Press the minus button to zoom out and the plus button to zoom in. You can also pinch to zoom by tapping and holding with two fingers at the same time and then moving the fingers together or apart.

You can switch between different map types using the map type button.

Waypoints

The map shows the waypoint icons at their location. If you tap on the icon, a popup menu appears to run operations on this waypoint:

Operation	Description
Mark	Mark this waypoint, then use the selection command in any stream to move or copy the waypoint.
Use as Target	Creates a new route with this waypoint and starts the route. Please refer to the route section for a detailed description of routes.
Edit Details	Opens the waypoint editor. Please refer to the waypoint section for a detailed description.
Move	Relocates the waypoint. Tap onto the map to move the waypoint. If you know the coordinates of the waypoint, use the waypoint editor instead.
Delete	Erases the waypoint from the database.

To add a new waypoint, select Add Waypoint. Then tap on the location on the map to create a waypoint there. If you want to create a waypoint at your current location, select Add Waypoint again.

Tap on the My Location button to pan the map to your current location. The map will follow your location when you move until you pan to a different location.
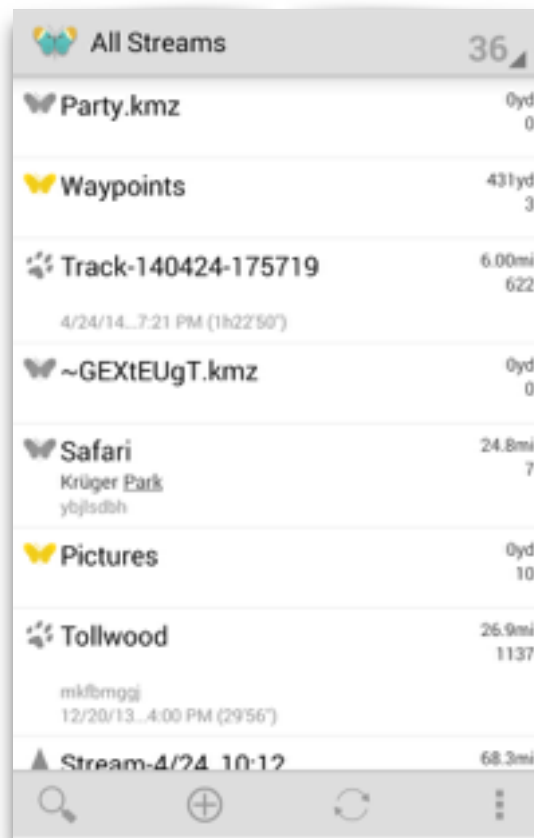
Streams

List all your streams, lets you filter streams by type and edit streams.

Streams are a core concept of GPS Essentials. A stream is a series of locations (waypoints, pictures, messages) that are structured in categories. Feel free to review details in the chapter "Domain Model" if you don't feel comfortable with the code data concepts.

When you tap on streams, you see a list of all streams.

Tap on All Streams to change the filter. Every filter limits the streams in the list based on a specific criteria. The following filters are defined:

| Filter	Description
All Streams	Shows an unfiltered list of all streams on the device

Filter	Description
All Tracks	Shows all streams with stream type "Track"
All Routes	Shows all streams with stream type "Route"
All Maps	Shows all streams with stream type "Map"
Shared Streams	Shows all streams that have been shared on mapfinity.com
Starred Streams	Shows all streams that are starred.

Review stream types in the Domain Model section for an explanation of stream types.

Notice that the filters are overlapping, some stream may appear under multiple filters.

Stream View

Tap on a stream to view this stream. GPS Essentials will open the list view of the stream. The list view shows the nodes of a stream by category. The list itself contains a number of cards followed by the nodes of the selected category.
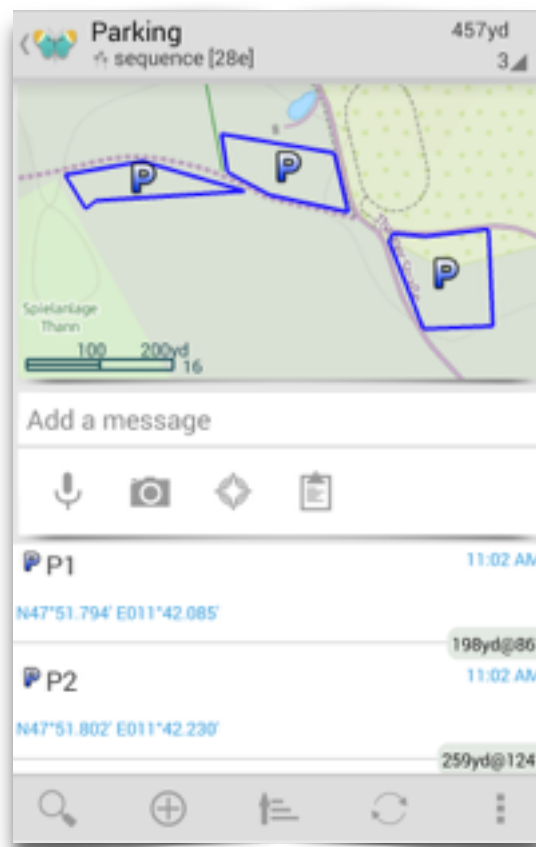
Tap on the title bar so change the category. For every category, you will also see the length and number of nodes for this category.

Creating New Nodes

There are a few ways you can create single new nodes in stream view. If you want to add a single waypoint with name, description and icon from known coordinates or your current location

Add a new waypoint

1. Tap **Plus** from the action menu.

2. Swipe to **Waypoint**.

3. GPS will start, wait until you have sufficient accuracy.

4. To enter coordinates, manually tap on the coordinates.

5. Enter name and description.

6. Tap on **Create**.

If you frequently add new nodes such as text or pictures, add the Post card to your stream:

Add the post card for text and pictures

1. Tap **Plus** from the action menu.

2. Swipe to **Cards**.

3. Tap on **Post.**
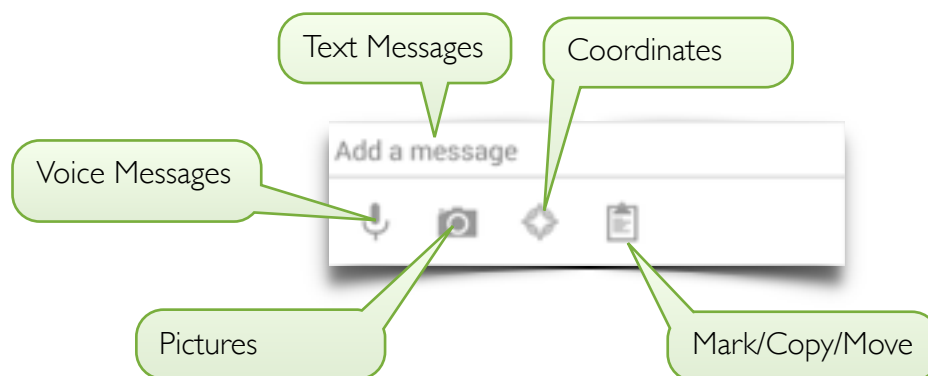
Mark/Copy/Move

You can mark one or more nodes in a category. Then you can reference these nodes later to create routes or you can copy or move them to another category.

Mark a set of nodes

1. Tap and hold on the first node until the action bar changes.

2. The action bar now shows the number of selected nodes and a set of contextual buttons.

3. Tap on more nodes to select or deselect them.

4. Tap on the hamburger button to select nodes based on criteria.

5. Tap on the checkmark button to mark the set of currently selected nodes and close the contextual action bar.

Copy or move nodes

1. Mark the nodes you want to copy or move.

2. Open the target stream and select the category.

3. Select **Selection** from the action menu.

4. Use **Copy** or **Move**.

The Mighty Plus

When you tap on the plus sign in the action bar, the add dialog opens. This dialog lets you add nodes from many sources to the current stream.

The mighty plus dialog has two incarnations: One behind the plus button in stream view and another one in the list of streams. (The list that opens when you tap on All Streams or one of its flavours.) While these two dialogs look identical at first, they do different things. When you open the dialog in stream view, you say that you want to add the new data to an existing stream. Using the latter dialog will create a new stream and then do the same thing.

The dialog is divided into separate pages. Swipe from one side to the other to change the page. A single page lets you enter all necessary information to perform a single task:

Page	Description
Waypoint	Adds a single waypoint to the stream
Cards	Adds a card or resets the list of cards
Category	Adds a new child category to the current category
Track	Starts tracking into a new category

Page	Description
Import	Reads data from files or web resources and creates nodes and categories from it.
Straight Line	Creates a straight line route between two or more waypoints
Directions	Creates a route with turn instructions between two or more waypoints
Terrain	Creates routes following terrain.

Waypoint

Creates a new waypoint in the current category.

Enter the information and tap Create to create the waypoint. The top banner shows the current GPS status. You can wait for sufficient accuracy before creating the waypoint. If you want to enter the coordinates manually, tap on the location.
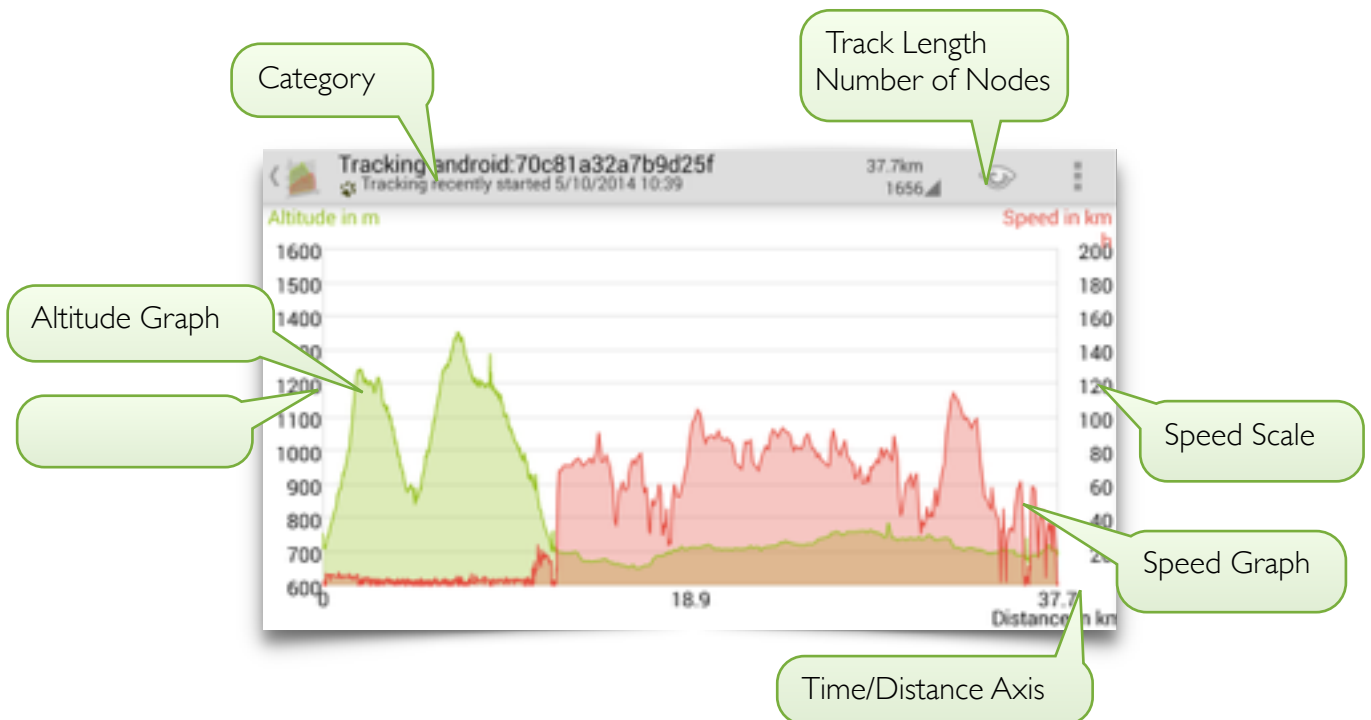
Cards

The cards page lets you add cards to the current category. Cards are shadowed rectangles on top of the node list that show condensed information about the stream or category. Some cards let you interact with the stream in a special way. To remove a card again, swipe it to the left or right until it disappears.

Your current card configuration is stored in the stream style, so cards will show again when you open the category.

Card	Description
Post	Quickly creates new nodes.
Info	Shows and changes the description of a stream.
Route	Lets you start and stop routes and switch between waypoints.

Card	Description
Track	Lets you resume and pause tracking and shows condensed information about the track. You can also start playback of the track. During playback, GPS Essentials uses the current track to read locations instead of the GPS unit.
Area	Lets you calculate areas.
Map	Shows the current stream on a map.
Chart	Shows altitude and speed charts
Trash	Clears the trash

Charts

The Chart card shows current speed and altitude information about your track.

Tap on the chart to open it full screen.

The chart has a title that shows the track ID, its name and its current length. The chart area shows two overlaying graphs. The points on each graph share the same value on the horizontal dimension,

but their value on the vertical axis is completely unrelated. The altitude graph has its scale on the left side and is green while the speed graph has its scale on the right side.

You can switch the horizontal axis between time and distance using the View command in the options menu.

Categories

You can add new categories to an existing category of a stream.

Add a category

1. Open the stream and select a category

2. Tap on plus and swipe to Category

3. Tap on the type of the new category

4. The dialog will close and you are back in the category where you started

Delete a category

1. Open the stream and select a category

2. Select **Clear** from the action menu

3. All nodes of the category and all descending categories and their nodes will be deleted as well

4. The list will show the parent of the category

Sometimes it is useful to change the type of a category. For example, when you imported data from KML, there is no information wether the elements of a folder are just a set of locations or a route. You can change the category type to route so that the stream shows up under All Routes.

Change a category type

1. Open the stream and select a category

2. Select **Style** from the action menu

3. Tap on the type spinner and select a type

4. Tap back to save your changes

Import

Use the Import page to read data from files and web resources. GPS Essentials supports KML, KMZ, GPX and LOC file formats. You can also import data from GPS Essentials version 3.2 database files.

Edit Node

Tap on an element of the stream list to edit this node. If the node is a picture, it will open in the picture editor. If it is a waypoint, it will open in the waypoint editor. You can also switch from the picture editor to the waypoint editor by tapping on the edit icon.

The node editor has a fixed part that shows the location and direction and distance to your current location. Below the fixed part is a multipage view that you can swipe left and right to switch pages.

To edit the location of the waypoint, tap on the location on the top of the screen. The location editor consists of a spinner control to select the location format and some edit fields and buttons.
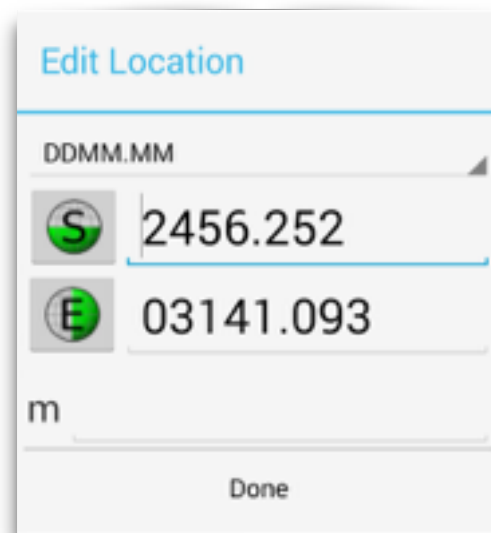
When you change the location format, the location will be presented in the new format. Press **Done** to submit your changes.

When you have entered some numbers into the location editor and then select another format from the spinner, GPS Essentials attempts to convert the location into the new format.

The following formats are supported:

Name	Format	Remarks
Degrees/Minutes/Fractions	DDMM.MM, e.g. 17301.04 means 172°1.04'	Notice decimal point is after the full minutes part
Degrees/Minutes/Seconds	DDMM.SS, e.g. 5703.12 means 57°3'12''	Notice the decimal point is after the minutes part
Decimal	D.D, e.g. 57.9234 means 57.9234°	
UTM	Zone/Northing/Easting	
MGRS	Grid Reference e.g. 4QFJ12345678	
OSGB36	Six Figure Notation, e.g. HU396753	

You can change the icon by swiping the icon list or tapping on any visible icon. The name of the waypoint is a short text string to denote the waypoint. Use the description field if you need to enter more text. The description field also supports tagging. Refer to the Tags section of this document for an explanation of this feature.

Routes

You use routes to plan a trip. Routing guides you to a specific node with the ability to advance to a successive node when you reach a target.

When you start routing, GPS Essentials will guide you to a target node. The target node is required to have a valid location. Apart from this, there is no other requirement. For example, the node can as well be a picture or an element of a track.

Start routing

1. Long tap on a node in stream view

2. Select the navigate button from the action menu.

The nodes in the same category as the target node are the current route. You can switch manually between those nodes or configure auto skip to advance to the next node automatically.

You can add the route card to the route to enable route controls.

Add the route card

1. Open the stream and select the route category

2. Tap on the plus button and swipe to Cards

3. Tap on Route

On the route card, you can start and stop routing and switch the the next or previous node.

There are other options to control routing: You can add the route control widget to the dashboard to advance the target node from the dashboard. These controls are also available in the map's dial menu.

Auto Skip

GPS Essentials can advance to the next node in your current route automatically. This ability is called *auto skip*. To enable auto skip, check Auto Skip Distance under the Routes section in settings.
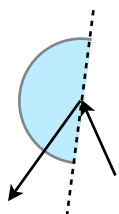
Auto skip will only happen when you are closer then the *auto skip distance* away from the target point. You can set this distance in settings. Additionally, you have to cross the bisecting line between your current leg and the subsequent leg of the route. The drawing on the left illustrates the algorithm: Auto skip will occur as soon as you are within the blue area.

When the first route point is active, auto skip will occur when you have passed a line perpendicular to the first leg, as illustrated in the drawing on the left.
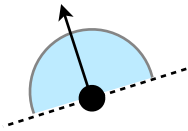
The Route Service

When you start a route, a service will run in the background to track route parameters, such as your current distance and to control voice out. Tap on "Start Route" to start the route service. This will target the selected route point or the first waypoint if you did not select one.

💡 The route service will continue to run in the background when you switch off the device or start another app. This will also cause the GPS receiver to stay on and drain your batteries.

Straight Line Routes

Creates a route between two or more waypoints. The legs between the waypoints will be straight lines.

🔲 Enter waypoints to a create route dialog

1. Select waypoints by long tapping in a stream list and then tap on the plus icon. The waypoint list will be populated with the waypoints you have selected. Notice that this only works if you tapped the plus icon while the nodes are selected. As a result, the new route will be in a child category of your waypoint nodes.

2. Select waypoints by long tapping in a stream list. Then tap the checkmark to mark the nodes. Tap on the plus icon in any stream and swipe to Straight Line. Now tap on the clipboard icon to paste the waypoints into the list.

3. Tap on the plus icon and swipe to the Straight Line dialog. Now tap on the plus icon to open the stream list. Tap on the stream whose waypoint you want to add, select the category and tap on the waypoint. Notice that you can only add waypoints one-by-one using this method.

You can delete a waypoint from the list using the cross icon next to each waypoint.

To change the order of the waypoints, tap and hold a waypoint and drag it to the new position.

🔲 Create a route

1. Tap on **Create** to create and open the route.

2. Tap on **Start** to immediately start the route.

Directions

The Directions dialog lets you create routes with turn instructions. You need a network connection to use this dialog, but once GPS Essentials has created the route, you can use it offline.

The waypoints list can be populated in the same way as described under Straight Line above.

Two additional spinners let you customize route construction.

Terrain Routes

The terrain dialog lets you create routes through terrain. No road or trails are required, the route will follow terrain based on the options you selected.

You have to select exactly 2 waypoints.

GPS Essentials comes with a demo version of terrain routes that is limited to 1km. Purchase the GPS Essentials Primordial Plugin to create routes up to 10km.
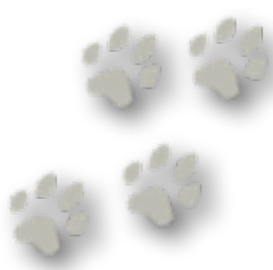
Tracks

Tracks are records of your trips. When you started recording, GPS Essentials continuously saves locations to a stream. You can review the track on the map, see it in chart view and export it to a file.

GPS Essentials can record your current location at specific intervals to the database. You can export these tracks to a KML or GPX file and import them into applications that support these file formats.

GPS Essentials has some build-in features to analyze tracks. For example, you can see the altitude and speed over time and distance using the chart tool.

Track Control

There are many ways to start, pause and resume tracking.

Start tracking to a new stream

1. Tap on Tracks to see a list of all existing tracks.

2. Swipe from the left screen edge to the right to open the side menu.

3. Tap on the record button to create a new stream and immediately start tracking into it

Start tracking to an existing track

1. Tap on the track in All Tracks or All Streams

2. Tap on the record button on the track card

3. If the track card is hidden, add it by tapping on the plus button and swipe to Cards

Resume tracking

1. Tap on the track in All Tracks or All Streams

2. Select the tracking category of the track to resume in the category selection

3. Tap on the record button on the track card

4. If the track card is hidden, add it by tapping on the plus button and swipe to Cards

The bear paw icon in the notification bar indicates that GPS Essentials is currently recording. This also means that GPS Essentials will keep running in the background and the GPS receiver will keep on running.

💡 Keep an eye on your remaining battery while tracking. Depending on the current tracking interval, tracking drains your battery within a few hours.

The notification bar contains an element like the following while you are recording a track.

Recording Symbol

If you drag down the notification bar, it contains the following element that represents you tracking activity.
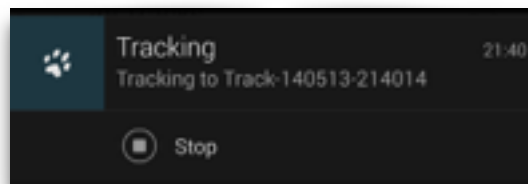
Tap on the element to open the track. You can also stop tracking using the stop button.

You can only record to one track at a time. When you are already recording to a track and start or resume tracking, the current recording will be paused.

Track recording will stop automatically when battery power is low.

Waypoints

The waypoints stream is a default place to store your waypoints.

Waypoints is a stream that keeps all new nodes that you create when you tap on the map on the start screen.

The Waypoints stream will spring to life when you delete it and create the next node on the map. Apart from this, the Waypoints stream is a stream just like any other. For example, you can star or unstar the stream to show it while viewing other streams.
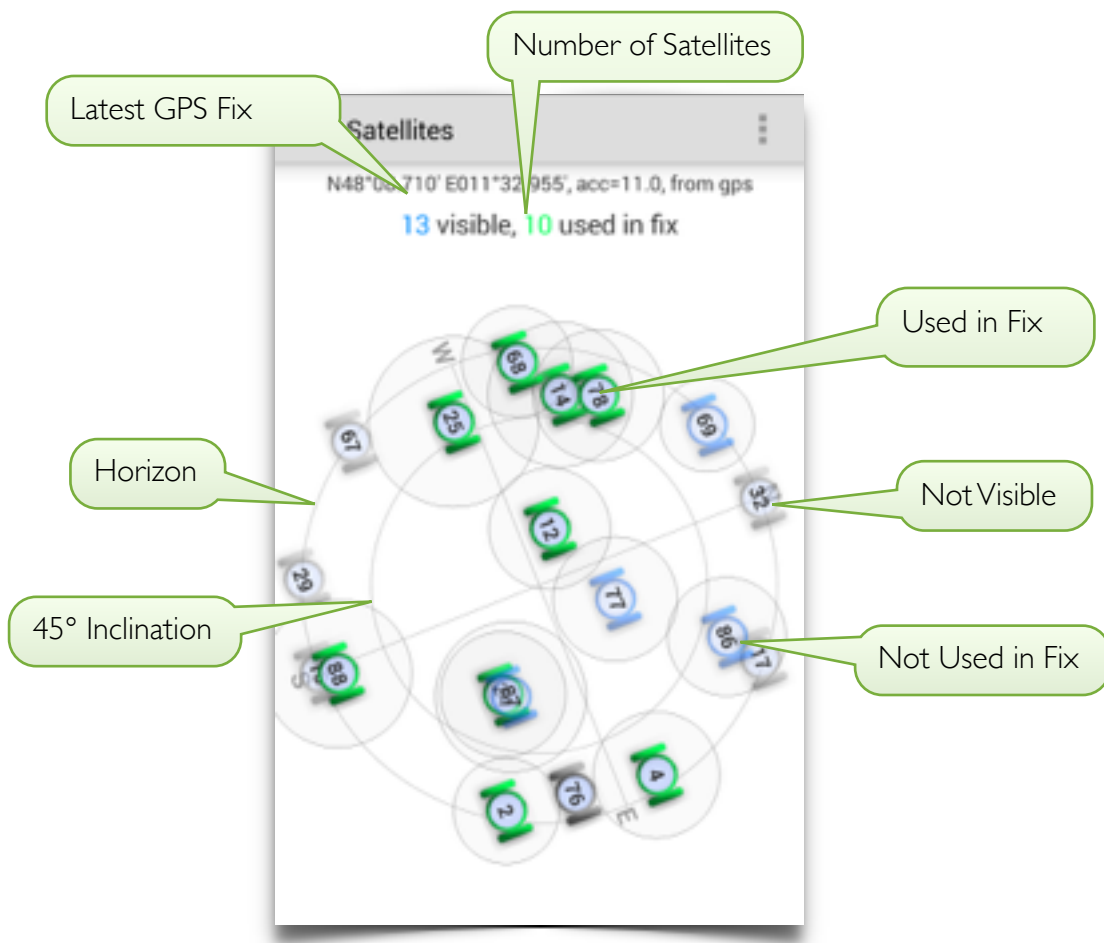
Satellites
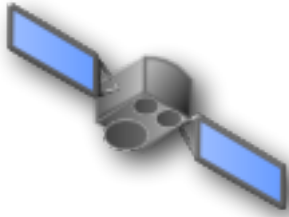
This is a sky view of all GPS satellites that are visible to your device. This view is good in cases when you don't have a GPS location and you don't know why.

GPS receivers interpret signals coming from GPS satellites that revolve the earth. Before a GPS receiver emits a location (also called a GPS fix), it must receive signals from at least 4 satellites. There are many things that can prevent the GPS receiver from seeing the satellites. The lower the satellite is above the horizon, the longer it's signals travel through the atmosphere so satellites high above the horizon usually have better signals. Thick clouds, especially thunderstorms can weaken the signal and so do windows, trees, vehicles and buildings.

The GPS antenna built into your Android device also plays an important role. Some devices work better than others.

The satellite view helps you understand the quality of the signal you are currently receiving and gives you an idea if and how you can take measures to improve it.

The view is an abstract presentation of the earth around you and the satellites above you from the perspective of an extraterrestrial observer who is right above you. N, E, S and W indicates the cardinal directions. The outer circle is the horizon and the inner circle indicates an inclination of 45°.

Every satellite has a circle around it and the radius of this circle is an indicator for the signal to noise ratio.

Satellites can be in view but not used for the GPS fix. This can happen if the signal quality is not good enough, usually because the signal to noise ratio of the specific satellite is too low. The text on the top of the screen indicate how many satellites are visible and how many satellites are used for the current fix. When enough usable satellites exist, the current fix and accuracy is displayed as well. Satellites used in the fix are green, unused satellites are blue.

Pictures

Shows, locates and shares the pictures that you took within GPS Essentials.

In Pictures, you can swipe though all pictures that you took in GPS Essentials. These pictures are separate from the pictures that you took using the camera app of your device.

The picture gallery supports immersive mode that hides navigation decorations so that you can focus on the content.

Switch the picture gallery to immersive mode

1. Double tap in the picture list to enable immersive mode

2. Double tap again to switch back

3. Swipe from the bottom of the screen to show the navigation buttons

Transferring Pictures

To share a single picture, select Share from the options menu. You will get a list of apps that you can use to share the picture. The list grows when you add more apps capable of sharing data.

All your pictures are in the folder `com.mictale.gpsessentials/images` on your SD card. You can delete pictures from this folder and you can even add new ones. GPS Essentials scans this folder regularly to see what's new..

Messages

Messages contain textual information about things that happened while GPS Essentials is running.

Messages are always listed by time with the latest message on top of the list and older messages further down. Unread messages are bold so that you can distinguish them from messages you have already read. The icon on your home screen will show the number of unread messages.

Messages older than 14 days that you have read are subject to garbage collection. From time to time, GPS Essentials will erase them so that your message list is not getting too long.

Currently, messages will be generated automatically based on specific events. One of our future plans is to support custom alerts that can generate messages.

Only important messages will be marked unread. Most automatically generated messages are already marked read, we don't want to steal your attention.

Messages can contain links and you can tap on them to follow. For example, when you started recording to a track, you can tap on this track right from the message.

Tags

You use tags to structure your waypoints, tracks and routes. Tags are words or short phrases that you can attach to any one of these entities. The Tag view then groups the entities by your tags.

By means of tags, you can structure your data. Because tags can be assigned to any kind of element, tags make it easy to bind together different element types, such as routes and tracks.

Tags should be very short terms that uniquely describe an aspect of the elements that you want to attach to them. Think of a tag as a label that you can attach to everything, but as opposed to a label, you can attach the same tag to many elements. E.g. if you are hiking, you will have many waypoints that denote camps. You can now add the tag Water to those waypoints that have water supply. When you open the water tag later, you'll see a list of all camps that have water supply.

You cannot add tags in tag view. To add a tag, open the element that you want to tag and open its editor. For example, if you want to tag a waypoint, open the waypoint list and tap on the waypoint. Enter the text of your tag into the description field and select it. On newer devices, you can tap and hold a word and then use Select word from the popup menu to quickly select a term. As soon as the selection markers appear, you will also notice a plus button on the top right corner of the text box. If you tap on this button, the selected term will be converted into a tag for the element that you are currently editing.

Here is an example of how the exit box looks like if you already created tags for Camp and water and you just selected food boxes.
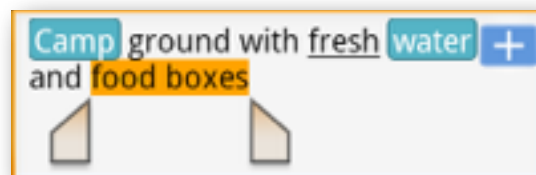
After creating the tag, your final description might look like this:
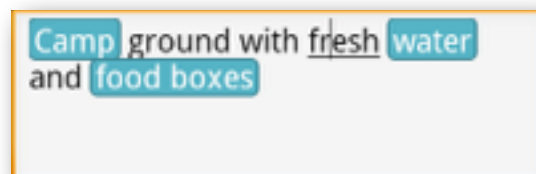
Settings

Configures all global settings in a single place.

The configuration is organized into sections. Tap on the setting to change it. Most of the settings have a list so that you can choose the desired value. If the setting is a simple yes/no choice, you can toggle a checkbox.

Setting	Description
GPS Update Interval	Selects the interval of GPS fixes. Faster updates increase readability but consume more battery. If you use the dashboard, is is recommended to use "Fastest".
Tracking update interval	Selects the interval of fixes saved to the recording track. Use bigger intervals to preserve space. If you select an interval that is shorter then the GPS update interval, then the GPS update interval will be used instead.
Widget Size	Selects the size of the dashboard widgets.
Widget Theme	Selects the theme used to render widgets.
Units	Selects a schema of units to show values.
Position Format	Selects the format of position values. You can choose between: • Degrees, Minutes, Seconds • Degrees, Minutes, Fractions of minutes • Decimal • UTM • MGRS • OSGB36
Bearing	Selects if bearings should be geographical or magnetic.
Temperature	Selects the temperature unit.
Auto Skip Target	If checked, the route will automatically advance to the next route point when you pass the target.

Setting	Description
Auto Skip Distance	Specifies the maximum distance to skip a route point. "Auto Skip Target" has to be checked for this value to take effect.
Speak Route Info	Reads the target waypoint name as you approach it on a route.
Announcement Proximity	Sets the distance for "Speak Route Info"
Device ID	Selects if you want to save the device ID to the pictures. If you select this option, the unique device ID will be stored in the Exif data of all pictures you take in GPS Essentials
Location	Selects if you want to save the current location to the pictures. If you select this option, the location will be stored in the Exif data of all pictures you take in GPS Essentials
Keep Screen On	Usually, the screen will switch off after a specific period of time to preserve battery. With this setting, you can switch this off when GPS Essentials is running in the foreground.
Error Reporting	Selects the desired strategy to send error reports. Error reports are generated automatically when something unexpected happens in GPS Essentials. Sending bug reports allows us to prevent this error in future releases. Check the appendix for a typical error report.

Donate

Tells you how you can support development and maintenance.

Developing and maintaining GPS Essentials is a lot of work. When you donate, you support this effort. You will not find any additional features in GPS Essentials when you donate, but we'll buy some time from the money you send and turn it into new features.

Our way to say thank you to those who donate is that we switch off ads when you installed the donation plugin.

The easiest way to install the donations plugin is to scan the following QR code with your device:

market://details?id=com.mictale.gpsessentials.plugin.donation
https://play.google.com/store/apps/details?id=com.mictale.gpsessentials.plugin.donation

Scripting

🚧 **Scripting is an incubating feature. It may be unstable, not documented properly and the APIs might change without notice.**

GPS Essentials provides an automation interface called "Scripting". With scripting, you can write scripts that automate your workflows and run at a later point in time. You can also use scripting to define custom ellipsoids and datums.

GPS Essentials scripts are written in JavaScript. If you are not familiar with JavaScript it is recommended that you at least learn the basics before writing your own scripts. You can still try out the tutorial and make simple modifications to the scripts in the tutorials with little or no knowledge of JavaScript.

All scripts are files located in com.mictale.gpsessentials/scripts on your primary storage location. GPS Essentials provides a simple script editor. You may also use third party script editors or edit scripts on your desktop computer and copy them into the scripts folder to use them.

Every time GPS Essentials starts or you synchronize in the script editor, all scripts will reload. If there is an error on your scripts, the script editor will show them. You will also see a notice on the start screen when there are errors.

📱 Write your first script

This step-by-step tutorial lets you write your first script that does nothing but shows a message.

1. Open GPS Essentials

2. On the start screen, tap on *Settings*

3. Tap on "Edit Scripts"

4. Tap on "Add" (the plus sign)

5. Enter *test* as the script name

6. Tap on the right arrow to create the script. This creates an empty script for you

7. Tap into the script window to activate the cursor on the last (empty) line

8. Enter

```
toast("Hello World!");
```

9. Tap on *Synchronize* to reload scripts. You should see a toast message.

10. If you have an error in your script, a red error message appears on the bottom of the screen.

Creating custom dashboard buttons

You can define a custom widget and write scripts that run when the user taps on the widget.

1. Create a new script that contains the following code:

```
var w = new Widget("addWaypoint");
w.title = "Add Waypoint";
w.description = "Adds a new waypoint at the current location";
w.addButton("tb_add").setTapListener(function() {
});

register(w);
```

What happens in this script? In the first line, we create a new widget for the dashboard. You need to specify a unique string so that the widget can store data. We will come back to this parameter in a later tutorial.

In the next 2 lines, we assign a title and a description to the widget. These values will show up in the add dialog. The next line defines a button in this widget. The first parameter to the function is the name of the icon.

The following icon names can be used: tb_add, tb_arrow_left, tb_arrow_right, tb_bulk, tb_camera, tb_chart, tb_check, tb_contact, tb_edit, tb_export, tb_help, tb_map, tb_more, tb_move, tb_mylocation, tb_navigate, tb_pause, tb_play, tb_remove, tb_search, tb_settings, tb_share, tb_view, tb_zoom_all, tb_zoom_in, tb_zoom_leg, tb_zoom_out,

The second parameter is a function that will be called when the user taps the button. We'll add an empty function here to do nothing.

Finally, we have to register the widget with GPS Essentials.

After reloading scripts, open the dashboard and tap on a free space to add a widget. The list should contain our new widget.

Add a waypoint

Let's add some code to create a waypoint to the previous script.

1. Open the script file from the previous tutorial.

2. Insert the following code into the function definition:

```
var n = new Node();
n.name = "Waypoint";
n.description = "This waypoint was created on user request";
n.iconId = "circle";
n.location = location;
waypoints.insert(n);
n.save();
```

3. Save the script and reload scripts in settings.

4. Tap on the new widget on your dashboard.

5. Check your Waypoints stream for a new waypoint.

Control routing

You can add more buttons to a widget. Notice that there is no overflow, and you have to try and error to find out the maximum number of buttons that work for you.

The following script creates a widget that allows you to pause and control the current route:

```
var w = new Widget("routing");
w.title = "Routing Control";
w.description = "Starts and stops routing";
w.addButton("tb_arrow_left").setTapListener(function() {
    Stream.navigatePrevious();
});

w.addButton("tb_pause").setTapListener(function() {
    Stream.stopNavigate();
});

w.addButton("tb_arrow_right").setTapListener(function() {
    Stream.navigateNext();
});

register(w);
```

Control tracking

The API supports creation of streams and track control. Here is a widget to start tracking into a new stream and you can also stop tracking:

```
var w = new Widget("tracking");
w.title = "Tracking Control";
w.description = "Starts and stops tracking";
w.addButton("tb_play").setTapListener(function() {
    var t = new Stream();
    t.description = "Stream created from the dashboard";
    t.save();
    t.track();
});

w.addButton("tb_pause").setTapListener(function() {
    var tr = Stream.trackingStream();
    if (tr == undefined) {
        toast("Not tracking");
    }
    else {
        Stream.stopTrack();
```

```
            toast("Tracking stopped");
        }
    });

    register(w);
```

Custom expressions

Expressions build the fundamental state model in GPS Essentials. For example, the value that GPS Essentials show in the speed widget is the result of evaluating an expressions. Expressions can consume other expressions. GPS Essentials maintains the dependencies of expressions.

You can provide JavaScript that calculates custom expressions like this:

```
    var tts = new Expression("timeToSunset");
    tts.setCalculateListener(function(time, sunset) {
        return sunset.getTime() - time.getTime();
    });
    register(tts);
```

When this script runs, the expression timeToSunset will be available in GPS Essentials.

The following expressions are defined:

Name	Description
gps	Provides the current GPS info
trackingAngle	Provides the current tracking angle
battery	Provides the current battery state
gpsStatus	Provides the current GPS status
time	Provides the current time
current	Provides the current location
route	Provides the current route
target	Provides the current navigation target
remainingDistance	The distance to the end of the current route
targetDistance	The distance to the next target
targetEasting	The easting value of the current target
targetNorthing	The northing of the current target

Name	Description
totalDistance	remainingDistance + targetDistance
xtd	Cross track distance
atg	Altitude to go
trackingSpeed	The speed towards the tracking angle
trueSpeed	The speed towards the target
course	The direction towards the target
courseFrom	The direction from the target to the current location (course + 180°)
turn	The change of direction
speed	The current speed
altitude	The current altitude
declination	The local declination
targetSlope	The slope to the current target
ttg	The time to go to the current target
totalTtg	The time to go to the end of the route
eta	The estimated time of arrival at the current target
totalEtg	The estimated time of arrival at the end of the route
climb	The vertical velocity
sunset	Today's sunset time
sunrise	Today's sunrise time
moonset	Today's moonset time
moonrise	Today's moonrise time

The following tutorial shows how to create a widget that shows this expression.

Expression widgets

Beside widgets that show buttons you can also define widgets that show formatted expressions. The following script shows a widget that consumes the timeToSunset expression from the previous tutorial:

```
var w = new Widget("timeToSunset");
w.title = "Time to Sunset";
w.description = "Shows the time until sunset";
w.setDrawListener(function(fmt, value) {
    fmt.timeSpan(value);
});

register(w);
```

Accessing a specific node

You can read specific nodes in a script. For example, the following script shows the distance to a specific node.

The script requires you to know the id of the referring node. To get the node identifier, open the stream that contains the node, tap on the node and swipe to "Properties". Scroll to "Key" and note the number after the hash sign.

```
var node = new Node(115854);

var home = new Expression("distanceToHome");
home.setCalculateListener(function(current) {
    return node.location.distanceTo(current);
});

var w = new Widget("distanceToHome");
w.title = "Distance To Home";
w.description = "The current distance to home";
w.setDrawListener(function(fmt, value) {
    fmt.distance(value);
});

register(home, w);
```

Calling scripts from Tasker

GPS Essentials provides a service that you can use to call a JavaScript function you defined in GPS Essentials from Tasker. The procedure may work in many other automation apps as well.

1. Open Tasker and tap on tasks to create a new task

2. Tap on "+" and enter a name for the new task

3. Tap "+" to add an action

4. Select "System" and then "Send Intent"

5. Enter `android.intent.action.RUN` as the action

6. Enter `application/javascript` as the mime type

7. Enter `javascript:toast('hello')`

8. Enter `com.mictale.gpsessentials` as the package

9. Enter `com.gpsesentials.RunScriptService` as the class

10. Select "Service" as the target

11. Tap back twice to save the changes

12. Add a profile or scene to trigger the task.

13. When you see the toast message, change `toast()` to your custom function.

14. Add your custom function to a script file, place it into the scripts folder and don't forget to reload scripts in settings.

Appendix A: All Step-By-Steps

Appendix B: Error Report

This is how a typical error report looks like:

```
Created: Fri Nov 11 00:41:31 GMT+01:00 2011
com.mictale.gpsessentials, version 2.6.13(90)

By: a5cba8536dad396b
Device: crespo
Fingerprint: google/soju/crespo:2.3.6/GRK39F/189904:user/release-keys
Build: GRK39F
Model: Nexus S
Product: soju
Android Version: 2.3.6

Font scale: 1.0
Keyboard: 1
Locale: en_US
MCC: 262
MNC: 3
Navigation: 1

Display
 Density: 1.5 (234.46153 x 236.27907 dpi)
 Size: 480 x 800 px

External Storage: mounted

SD-Card Path: /mnt/sdcard
 Total: 13624MB (14286163968)
 Available: 4831MB (5066543104)

Data Path: /data
 Total: 1007MB (1056858112)
 Available: 665MB (697585664)

Free memory: 4067160
Max memory: 33554432
Total memory: 8527840

Number of active threads: 15
Thread 41='GameLoop', TIMED_WAITING (priority=5)
Thread 37='android.hardware.SensorManager$SensorThread', RUNNABLE (priority=5)
Thread 33='GameLoop', WAITING (priority=5)
Thread 30='pool-1-thread-1', WAITING (priority=5)
Thread 23='Binder Thread #3', RUNNABLE (priority=5)
Thread 18='WebViewWorkerThread', RUNNABLE (priority=5)
Thread 17='http3', WAITING (priority=5)
Thread 16='http2', WAITING (priority=5)
Thread 15='http1', WAITING (priority=5)
Thread 14='http0', WAITING (priority=5)
Thread 12='CookieSyncManager', RUNNABLE (priority=5)
Thread 11='WebViewCoreThread', RUNNABLE (priority=5)
Thread 9='Binder Thread #2', RUNNABLE (priority=5)
Thread 8='Binder Thread #1', RUNNABLE (priority=5)
Thread 1='main', RUNNABLE (priority=5)
An exception in thread Thread[main,5,main] (1)

A top-level exception com.mictale.view.BindingException
com.mictale.view.BindingException: java.lang.IllegalArgumentException: The
longitude 4851.0078125 is out of range.  Please enter a value in the range
[-180, 180).
```

```
        at com.mictale.view.Binding$1.onClick(Binding.java:185)
        at android.view.View.performClick(View.java:2485)
        at android.view.View$PerformClick.run(View.java:9080)
        at android.os.Handler.handleCallback(Handler.java:587)
        at android.os.Handler.dispatchMessage(Handler.java:92)
        at android.os.Looper.loop(Looper.java:130)
        at android.app.ActivityThread.main(ActivityThread.java:3683)
        at java.lang.reflect.Method.invokeNative(Native Method)
        at java.lang.reflect.Method.invoke(Method.java:507)
        at com.android.internal.os.ZygoteInit
$MethodAndArgsCaller.run(ZygoteInit.java:839)
        at com.android.internal.os.ZygoteInit.main(ZygoteInit.java:597)
        at dalvik.system.NativeStart.main(Native Method)
Caused by: java.lang.IllegalArgumentException: The longitude 4851.0078125 is out
of range.  Please enter a value in the range [-180, 180).
        at com.mictale.util.UTM.latLonToUTM(UTM.java:378)
        at
com.mictale.gpsessentials.format.UTMPositionFormatter.formatPosition(UTMPosition
Formatter.java:47)
        at
com.mictale.gpsessentials.format.UnitFormatter.formatPosition(UnitFormatter.java
:176)
        at
com.mictale.gpsessentials.waypoints.EditWaypointActivity.updatePosition(EditWayp
ointActivity.java:176)
        at com.mictale.gpsessentials.waypoints.EditWaypointActivity.access
$1(EditWaypointActivity.java:174)
        at com.mictale.gpsessentials.waypoints.EditWaypointActivity
$1.onSave(EditWaypointActivity.java:222)
        at
com.mictale.gpsessentials.waypoints.EditLocationDialog.onDoneClicked(EditLocatio
nDialog.java:134)
        at java.lang.reflect.Method.invokeNative(Native Method)
        at java.lang.reflect.Method.invoke(Method.java:507)
        at com.mictale.view.Binding$1.onClick(Binding.java:176)
        ... 11 more
```

Appendix C: Versions

GPS Essentials receives regular feature additions. Since we deployed GPS Essentials to Android Market for the very first time, we pushed 46 updates at the time of this writing.

Every release has a unique version number that consists of three parts: A major version, a minor version and a build number. The major version number changes when something dramatically changes in GPS Essentials and we went from 1 to 2 when we added tracking because this was a big step ahead. The minor version we increment whenever a new piece of functionality was added that we think is worth mentioning. While we add new features, we are also maintaining the app to remove bugs, make it more stable and support specific devices. Every time a new release comes out, we increment the build number so that we can distinguish the releases.

The minor version number also indicates the maturity of the release. If the number is odd, then we are working on the development branch and the release might contain glitches and hickups, but all brand new features are in. You will not see these releases on Android Market, if you want to have these releases you have to go to http://www.mictale.com/gpsessentials/download. From time to time, we run the development branch through excessive testing and the result is a stable release that we push to all distribution platforms.

Appendix D: Contacts Plugin

The contacts plugin is a supplemental package that you can install on your device. It is available on Android Market and from the download site http://www.mictale.com/gpsessentials/download.

To use the contacts plugin, open map view and select **Find Contact** from the options menu. You can select an entry from your phone's contact list. GPS Essentials will attempt to resolve the postal addresses of this entry to locations and show you these locations. Tap on a location to convert it into a waypoint.

Use this QR code to install the plugin:

market://details?id=com.mictale.gpsessentials.plugin.contacts
https://play.google.com/store/apps/details?id=com.mictale.gpsessentials.plugin.contacts