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WA Rogaining Association

GPS Users Manual

Version 2



ABOUT THIS MANUAL

All setters and vettors who plan on using a GPS as part of the setting or vetting process should read this manual.

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1. GPS USAGE POLICY

Rule 7 of the Australian Rogaining Association's *Rules of Rogaining* states

- (a) The only navigational aids that may be carried on the course are magnetic compasses, watches and copies of the competition map.*
- (b) The possession of other navigational aids, including pedometers, altimeters and GPS receivers on the course is prohibited except in accordance with (d)*
- (c) The possession, at the event site, of maps that provide additional information not shown on the competition map is prohibited.*
- (d) Event organisers may provide sealable, tamper- evident, opaque containers to competitors, for the purpose of carrying a communication device or GPS unit during the course of an event, primarily for the safety or to aid in post event analysis. Each unit carried on the course must be sealed inside the container in the presence of the event organisers and recorded on a register. At the event conclusion all containers must be in by the event organisers against the register before being opened. The penalty for opening a sealed container during the event or failing to check back in shall be disqualification.*

All setting and vetting should be conducted under the same conditions as rogainers compete under, namely by means of map and compass. As a consequence:

- all setting should be conducted using map and compass only
- controls should be vetted using map and compass only in the first instance
- a GPS may be used to hang controls.

However, a GPS is a useful tool that can facilitate the setting and vetting process. A GPS can be used in the following circumstances:

- recording of the location of a setting plate once the location has been selected
- recording of alternative control locations during the vetting process
- control collection
- validation of location of mapped features
- addition of unmarked features to a map.



2. GUIDELINE ON THE USE OF A GPS

A GPS unit is a valuable aid in setting a rogaine as it can assist in ensuring that controls are hung in the location as shown on the competition map. It must be remembered however that the competitors only have a map, a compass and a control description to tell them where each control is located. A GPS unit should prevent a control being set on a wrong nearby feature (as has happened on occasions in the past). It can also be helpful in positioning the circle on the map when a linear feature has been used.

It is noted that the OOMAPPER map co-ordinates should be verified prior to the use of a GPS in the setting/vetting process (Section 3.2). Old digital map data may be in a different grid system than currently in use (AMG rather than MGA) or the OOMAPPER map may have accidentally been moved (one occasion of the entire map data being moved 800 m has been recorded).

2.1 Setting Controls

The armchair planning and setting should be done in the traditional manner, as documented in the Setting Manual. Once the controls sites have been identified on paper and a base map has been created in OOMAPPER, the setting team should then arrange to set the controls in the field.

The setters will navigate to the proposed location using map and compass only.

The setting plate should be hung at the selected site and the working map annotated to show the position of the control. The description of the control should be recorded plus any other relevant notes. Only when this has been done should a waypoint for the location be recorded on the GPS. The waypoint recorded on the GPS should be given the same name as appears on the setting plate (Section 3.4). This should be done for each and every setting plate hung.

When the fieldwork is done by the setting team and the draft OOMAPPER map has been updated with the location of the setting controls as hung, the waypoints can be imported and checked against the manual placement of the circles on the map. Any anomalies that cannot be explained should then be investigated in the field during subsequent visits.

The control circles on the draft map should NOT be placed with reference to the GPS waypoint. Where a linear feature has been used for a control site (the spur, the watercourse) it is acceptable to move the circle on the map so that it agrees more closely with the GPS reading.

There could be a temptation to pre-load the GPS co-ordinates for controls set during the armchairing process and then navigate using the GPS to the control site when hanging the setting plate. This is forbidden. It could create a situation where unfair control sites are selected, including sites that may only be navigated to by a GPS unit.

2.2 Vetting Controls

The same process can be used when the vetting team is in the field checking the control sites. The vetting team must only use the competition map, compass and control description to find the control site. The vettors should only use a printed map that shows the final intended location for each control to be vetted.

The vettors will navigate to the proposed control site using the competition map, control descriptions and compass only.



The vetting teams' set of waypoints can be imported into the draft OOMAPPER map in the same manner and compared against the manual placement of the circle on the map and the way points recorded by the setting team.

If the control site cannot be found without the aid of the GPS it should not be used.

Both the setting and vetting team must be able to find the control site using the same map and compass technology that the competitors will be using.

If the vettors wish to suggest an alternative control location, after hanging the vetting tape they can record the waypoint of the alternative location for use by the setters in re-assessing the control.

2.3 Hanging Controls

It is acceptable to use a GPS when replacing the setting controls with the competition controls. This can speed up the process of hanging the controls. There may be rare occasions when the map may need to be changed at this late stage (perhaps following a fire). The actions to be followed will depend on whether the competitions maps have been printed or not.

2.4 Control Collection

Once an event is over, how control collectors get to the controls is irrelevant.

It is acceptable for control collectors to use a GPS to locate the controls.

Some control collectors may choose to use a GPS to locate their controls. The vettors should have a hard copy of the waypoint details available so that the control collectors can enter the details into their GPS.

2.5 Map Verification

The data purchased by WARA from DOLA can be a number of years old and it is possible that new features such as dams and tracks/roads may have been constructed since the map data was created. There are two ways of managing the process of collecting data with which to update the map in OOMAPPER: recording point features by taking waypoints (Section 3.2) or keeping a log, or "track" of your day's movements.



3. USING A GPS

3.1 General

Before using the GPS for the first time you may wish to adjust the track recording feature of the GPS. The track feature creates an electronic bread crumb trail or track log on the GPS's map page as you travel. The track can be recorded based on time or distance parameters. The suggested setting is 5 seconds or 0.01 km. As an example, the Garmin etrex Legend HCx has a capacity of 10,000 points available to define a track. If the 5 second interval is used with this unit, this will allow for about 13 hours of recording. 100 km of recording can be done if the 0.01 km setting is used. You will need to check the storage capacity of your GPS to determine the equivalent parameters.

- Always carry a spare set of batteries. Data will not be lost if the batteries in the unit expire or when the batteries are being replaced (Alkaline batteries should have a continuous life of approximately two days, this is variable depending on the unit).
- Waypoints for locations that lie outside the OOMAPPER map area will produce an error when loaded into the map. These extraneous waypoints will need to be deleted from the GPS or edited out of the GPX file before uploading into OOMAPPER.
- When making a track log it is important that you only record a log for the current rogaine area. When you arrive at the rogaine site turn on the GPS and delete old tracks. Make sure the track recording feature is turned on. At the end of the day before going home turn off the track recording feature. The GPS can be turned off during the day while on site to preserve the batteries. If you move from one location on the map to another while the GPS is turned off a straight line track will be recorded between the two locations.
- Refer to the owners' manual for more information.

3.2 Verifying Map Co-ordinates

The coordinates used by OOMAPPER may not agree with those recorded on the GPS. The difference is likely to be not more than about 100 metres. To verify the co-ordinates of a map it is necessary to compare data from the map with data recorded in the field.

The first time you go into the field, take a number of waypoints at obvious and accessible locations on the OOMAPPER map, such as track intersections or corners of buildings/dams. Other waypoints for control locations etc can also be taken.

After the map has been updated load the waypoints into the OOMAPPER map (note Section 2.1). Check to see if the waypoints of the obvious features are in the correct location. Follow the procedure in Section 3.8 of the OOMAPPER manual (Appendix K – Map Standards and OOMAPPER) to make a correction. If you are re-using map data from an earlier rogaine, it is most likely that this correction will already have been made.

3.3 Recording a Feature

Point features such as control locations, small dams and building are recorded as waypoints. Every effort should be made to add missing features such as new dams and buildings to the map.

Linear features such as tracks and roads can be added to the OOMAPPER map using the recorded "GPS tracks". Tracks and roads may be "new" or altered since the map data was produced. In WA



forest country it is common to find new tracks/roads and overgrown/vague ones as well. These changes to the map can only be made after you have walked or driven along the feature with the GPS.

3.4 In the Field

At the desired location:

- at the Main Menu on the GPS, select *Mark* (on a Garmin etrex HCx GPS). The default name of the waypoint is a number.
- If the waypoint is a control rename the waypoint so that its name is the same as the setting plate. (refer to the GPS manual to find out how to rename a waypoint).
- If the waypoint is another type of point feature keep a written record of the waypoint number and the description of the feature.

This location is now recorded. To check that the recording is correct go to Main Menu and select *Find* and then select *Waypoints*. All recorded waypoints are now displayed and can be edited / deleted if incorrect.

3.5 Using Tracks

Make sure that you turn tracks on before you start work for the day. It is useful to have a record of everywhere you went. This enables you to

- Verify the location of tracks
- Add additional tracks not marked on the map
- Provides you with a record of exactly where you went, which can be useful for determining access routes for control hanging/collection.



4. RETRIEVING DATA FROM THE GPS

OOMapper cannot read data directly from a GPS. It needs to be downloaded from the GPS and stored in a gpx file for transfer into OOMapper. EasyGPS is a freeware package that can read data from most GPS units while BaseCamp is the Garmin-specific unit if you are using the WARA GPS units.

4.1 Transferring data from the GPS using EasyGPS

Download the EasyGPS software from www.easygps.com.

- Launch EasyGPS
- *Edit | Preferences | Add GPS*
- Select the GPS type and then model from the drop down lists (e.g. *Garmin | etrex Legend HCx*)
- *OK*
- If your GPS is not listed, use the *My GPS is not listed* button to send a query to software support at EasyGPS.
- Connect the GPS to the computer using the USB cable supplied with the GPS and switch on the GPS
- In EasyGPS, click on *Receive* (either the *Receive* icon or under the *GPS* menu option)
- Tick *Waypoints or Tracks*. Save the waypoints and tracks in separate files.
- If there is any data outside of the rogain area, delete the points in EasyGPS. If they are downloaded into OOMapper, OOMapper will rescale the view to include all points and you may lose track of where your map is on the screen
- Tracks or Waypoints are now downloaded to EasyGPS. You can either select a few points to save
- Click *File | Save* - You will be asked to nominate a file name to save the data downloaded – the data will be saved as a file with a .gpx extension. Make sure that you name the file in a logical manner, such as using the event name and date of data collection. i.e. Schulstaad 13 Aug.gpx.

4.2 Transferring data from the GPS using Basecamp

The Garmin etrex Legend HCx units used by WARA were supplied with a software package *Trip and Waypoint Manager* to be used to download data from the unit. This software has been discontinued and is now replaced by Basecamp. Download the Basecamp software from www.garmin.com/en-AU/software/basecamp/

- Launch BaseCamp
- Connect the GPS to the computer using the USB cable supplied with the GPS and switch on the GPS



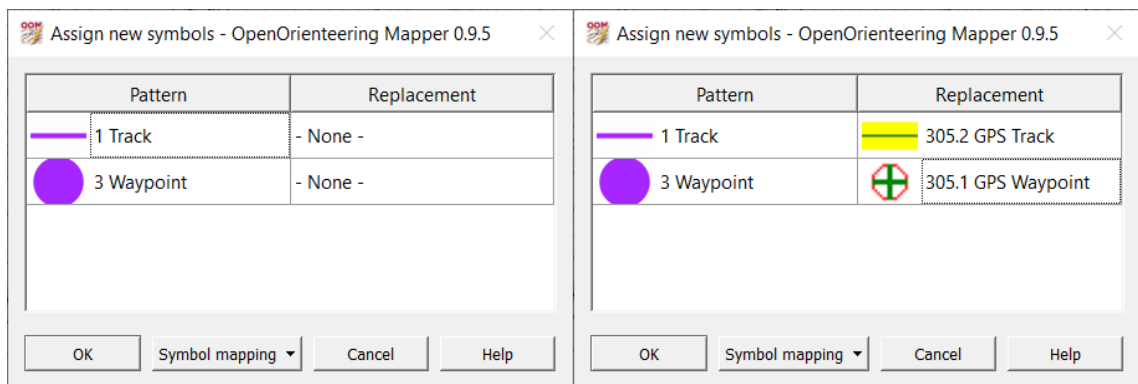
- Your device should appear under Devices on the left hand side of the screen (as *eTrex legend HCx Internal Storage* and the waypoints/routes appear on the map. If the data does not appear, click on *Device | Receive from Device*
- If the only data on the GPS relates to the current map, you can export all the data to a gpx file
 - *File | Export | Export : "Internal Storage"*
- If there is other data on the GPS that has also downloaded, select the points that you want from the list and
 - *File | Export | Export Selection*



5. IN OOMAPPER

5.1 Loading GPX files into OOMAPPER

- Launch OOMAPPER
- Open required map and *File | Save as* (always work with a new copy of the map, in case the current copy becomes corrupted)
- From the menu bar *File | Import* and navigate to where your gpx file is located
- Select *Georeferenced* so that your data comes in in the right location
- Select *No* to *Should the waypoints be imported as a line going through all points*
- A window will pop up asking you to assign new symbols. It will come up with defaults, as shown on the left below. If you just click on OK, these will appear on your map, but the symbol is rather large and not very useful. WARA-specific GPS symbols have been set up that are easier to use. Click on – *none* – and a scroll list will appear – scroll down till you find the symbols as shown on the left below and select these. If they do not appear, you can select any other symbol or go with the defaults. Just make sure that the you are not already using the symbols you select as you will not be able to turn them off later (e.g., do not use a track symbol for the GPS track or a dam for the waypoint).



Once imported, OOMAPPER will zoom the screen to the extent of the imported data. It should appear within the extents of your map. **If the GPS data does not appear in the right place seek help from WARA Map Co-ordinator who you received the base map from.**

If you now zoom in each waypoint should now appear as a small circle with a green crosshair, hopefully inside the control circle.





5.2 In OOMAPPER

For each waypoint recorded, compare the waypoint with the feature on the map. In the case of controls, make sure that you compare the waypoint with the centre of the circle.

If the waypoint is within 20 m of the feature it is accepted as that they are effectively the same. If the difference is greater than 20 m, an investigation may be required.

If the difference is significant, check out the map features. Is there a similar feature on the map to the one being recorded – could it be a parallel feature?

Are the contours inconsistent with the waypoint? E.g., the waypoint was taken on a spur but the location on the map is a couple of contours off the side of the spur. Remember that the contours are drawn off aerial photographs and are not 100% accurate.

If the track data is to be used to make changes to the OOMAPPER map this should be done as soon as possible after your trip into the field. The two things you are most likely to do are:

- Correct the position of an existing track or road. Do this by choosing to edit the object and then selecting edit point. This allows you to drag the existing points that define the position of the object to a new location.
- Add a new track or road. Select the correct symbol type and using the drawing modes put in the new feature.

There may be occasions where you may want to modify the location of a watercourse or extend its length.