

# Tristan Darwin Project



# GPS Training

*A Guide to Connecting your Computer to the Garmin Etrex GPS Using  
Memory-Map Navigator GPS Software*





## About This Guide

This training guide explains how to connect a GPS to your computer and how to use the software to view, organise, store and transfer information between the two.

## What Can It do?

A hand held GPS device such as the Garmin Etrex can record tracks, routes and waypoints and save them in its internal memory. The amount of data it can store is limited to 500 waypoints, 1 route and 10 track records. Using computer software gets round this problem by allowing you to store an unlimited number of waypoints tracks and routes. It also allows GPS data to be easily trans-

ferred from one GPS device to another. Memory Map Navigator will also display this data on a map or chart which allows you to see where you've been. It also works the other way round - you can plot waypoints or routes onto the map on the computer screen and then transfer them to the GPS device which will show you which way to go.

## Some terms explained

- WAYPOINT** A WAYPOINT is a position on the earth's surface recorded into the GPS unit or computer. This software also calls it a MARK when its not part of a route. Waypoints can be given names (the Etrex can only handle names up to 6 characters long) and you can choose a symbol as well, such as flag, anchor, etc.
- ROUTE** A ROUTE is a list of waypoints which show the start and and finish points and all the points that should be visited on the way.
- TRACK** A TRACK is a line showing where the GPS device has been. It is made up of a large number of points which are recorded by the unit as it moves along.
- CHART** A CHART or MAP is a digital version of a paper chart or map which can be displayed on the computer screen. It will have been calibrated to show the position (Lat/Long) of points on the map.
- POSITION FORMAT** A POSITION is a point on the map or in the real world. The POSITION FORMAT used is usually latitude and longitude which can be expressed as either  
degrees.decimal degrees  
degrees.minutes.decimal minutes, or  
degrees.minutes.seconds
- OVERLAY** An OVERLAY file is what this software package uses to store a set of data which can include waypoints routes and tracks. These are shown as a separate layer on top of the map or chart,. Each item on the overlay layer can be shown on the map or hidden from view.



# SCREEN LAYOUT

The two main windows you will use in this software are the Chart window and the Properties window

## Chart window

The screenshot shows the Memory-Map Navigator software interface. The title bar reads "Memory-Map Navigator [Licensed to Paul Tyler] - [C:\PROGRAM FILES\MEMORY-MAP\NAVIGATOR\qct\Tristan.qct]". The menu bar includes Chart, Overlay, GPS, PDA, Search, Mode, Window, and Help. The toolbar contains icons for Chart, Props, Zoom, Zoom in, Zoom out, Scale, Scale, Alt, Drag, Route, Mark, MOB, Lock, Data, and Help. The main map area displays a topographic chart of a coastal region with a blue route connecting waypoints WP01 through WP05. A red track is also visible. The status bar at the bottom shows "Show a smaller area in more detail", "Cursor: 37°03.162'S, 12°20.952'W (WGS84)", "GPS: Timeout sending packet: 254", and the system tray with the Start button, "Memory-Map Navigat...", and the time "12:33 PM".

Annotations and labels on the screenshot include:

- Zoom in and out**: Points to the Zoom, Zoom in, and Zoom out icons in the toolbar.
- Go to bigger or smaller scale map (if available)**: Points to the Scale and Scale icons in the toolbar.
- Load new chart**: Points to the Chart icon in the toolbar.
- Draw new route**: Points to the Route icon in the toolbar.
- Mark waypoint**: Points to the Mark icon in the toolbar.
- Show / hide data**: Points to the Data icon in the toolbar.
- View properties**: Points to the Props icon in the toolbar.
- Waypoints making up the route**: Points to the blue route line and its waypoints (WP01-WP05).
- Route**: Points to the blue route line.
- Track**: Points to the red track line.
- Waypoint**: Points to a specific red triangle marker on the map.
- Current position of cursor**: Points to the coordinate text in the status bar.
- Current GPS status**: Points to the "GPS: Timeout sending packet: 254" text in the status bar.



## Properties window

In the OVERLAY PROPERTIES window you can see everything that is currently in the map overlay. You are able to do the following things:

View details of all the waypoints currently loaded

Change a waypoint's name, its symbol or its position

Hide or show the waypoint on the map, hide / show its name, or lock its position

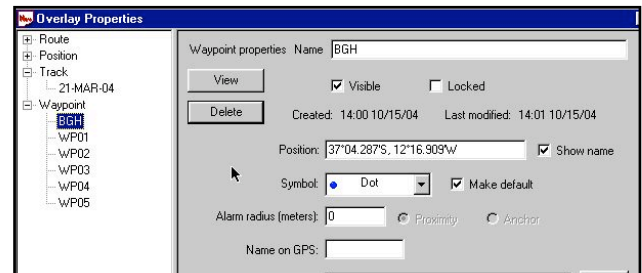
Hide / show a route and look at the waypoints it contains

Hide / show a track and change its colour

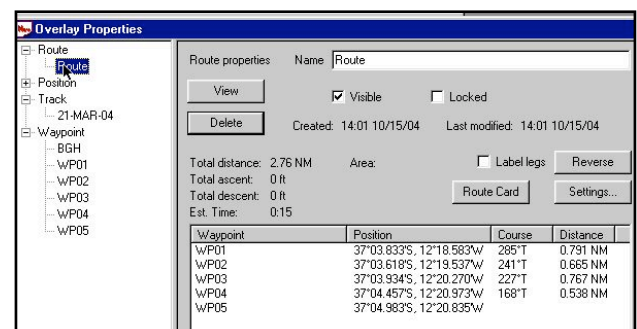
See how long a track is, when it was made, and what the maximum speed was

Some of this information can be accessed via the map page by right-clicking the object.

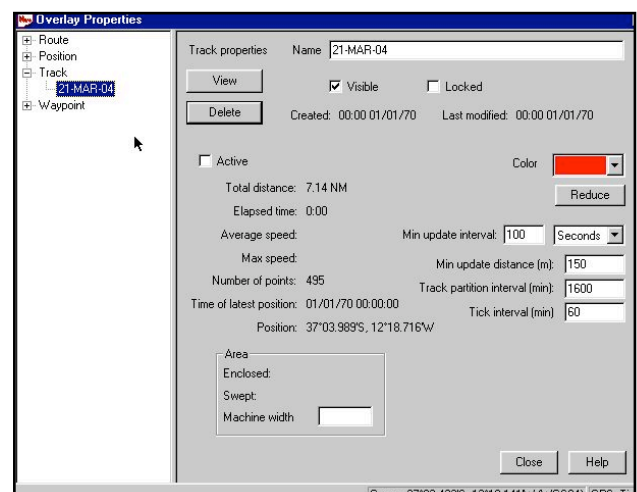
It is important to be able to hide or show various items in the overlay because that is the principal way of managing the data when saving it to the computer disk. When you export (save) an overlay file it saves everything - waypoints, routes, and tracks - currently loaded. By hiding some items you have the option of saving only the visible items in the overlay to disk, or deleting all the hidden ones.



Waypoint properties



Route properties



Track properties



## CONNECTING THE GPS TO A PC

At the top of the GPS unit is a small connector. This allows the GPS to be connected to the serial port of a PC.

Once connected you can transfer waypoints, routes and tracks from the GPS to the PC and back again.

This can be used to:

see where you've been (the waypoints you marked) and how you got there (the recorded track)

draw a route or waypoints directly onto the map and then use the GPS to follow the route or visit the waypoints in the real world

store a track and waypoints that you, or somebody else, made on a particular day and use it on another day when you want to go to the same place

For instance, if you recorded a track when you visited Nightingale in good weather, you could use the same track a year later to follow the same path even though the visibility is very poor and you can't see where you're going.

Alternatively you could plot a route on a map on the computer and use that to follow the same route.

### What to do

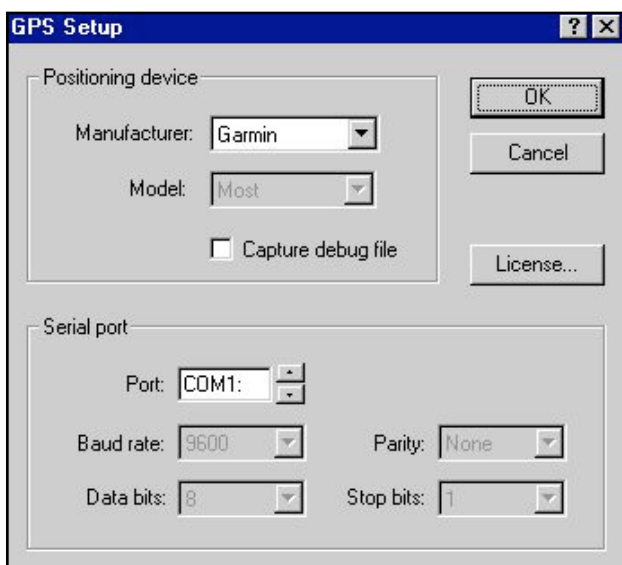
Connect the GPS to your PC.

Go to **GPS > GPS setup**. Choose **Garmin** and **Port > Com 1** (*you only need to do this the first time you use it*)

Go to **GPS > Import from GPS**

You can then choose whether to load in the **Marks (=waypoints)**, **Routes** or **Tracks** stored in the GPS.

To transfer data the other way ie from computer to GPS, follow the same procedure but choose **Export to GPS** instead.



**WARNING!** THE MAPS AND CHARTS USED BY THE TRISTAN DARWIN PROJECT HAVE BEEN SCANNED IN FROM PAPER MAPS AND ARE THEREFORE NOT 100 PERCENT ACCURATE!

It is safer to follow a route that you have already travelled and recorded than to rely on the accuracy of the computer's map when planning a journey



## Managing the Data

Once you understand the idea that you can hide or show the various items that make up the overlay file it is quite simple to manage the data.

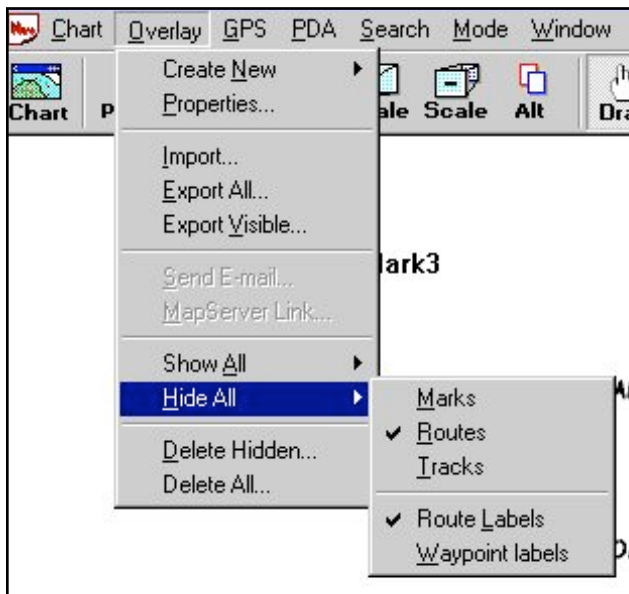
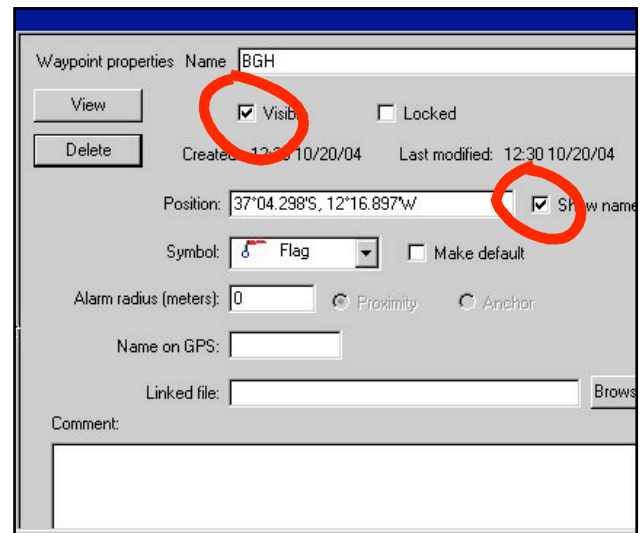
By using this feature you can save just a few waypoints into a file, or maybe just a new track that you've made, without having to save everything that is currently loaded into the overlay layer.

There are 2 main ways to do this:

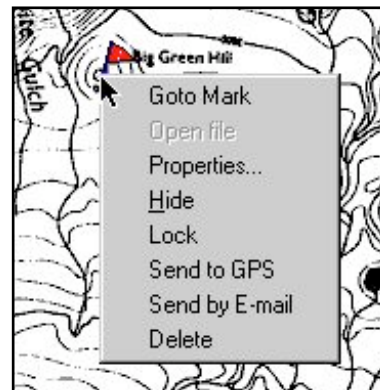
1. Hide all the waypoints, or tracks, or routes, all at once. Just go to **Overlay > Hide All > Marks** (or any of the other choices). Use the **Show all** menu to un-hide them.

-

2. Use the **Overlay Properties** screen to examine and individually control the visibility of each item (check or un-check the **Visible** box). You can also show or hide the waypoint name on the map this way, useful if the screen is becoming too cluttered.



A third way to quickly hide something that's visible on the map screen is to right-click it and choose **Hide**. Right-clicking is also a quick way to see the **Properties** of that particular item, or send it straight to the **GPS**.





## Getting information straight from your map or chart

You can get information from the chart window by clicking the `Data` button. You can also use the `Route` button to measure distances and directions between points.

### The Data button

When the `Data` button is highlighted a box will appear showing the position of the mouse cursor. If you point at a waypoint it will show its name and position; if you point at a route it will tell you its name and details of distance and bearing, and if you point it at a track it will tell you its name and other information.

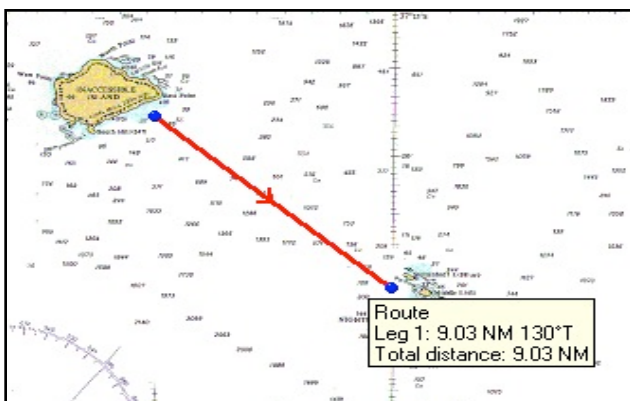
### The Route Button

This is especially useful for measuring distances on your map

You can easily find the distance between two or more points on your map by quickly drawing a route. This is made even simpler if the `Data` button is on. This is what to do:

Click the `Data` button

Click on the `Route` button. Now click on the map at your start point - a waypoint will be created. Now move the cursor to the next point and click - another waypoint will be created. The `Data` box shows you straight away the distance and bearing to the second waypoint. You can carry on adding waypoints to this route, or press `Return` or `Enter` on your keyboard to finish it.



It is important to remember that the distance shown is as the crow flies i.e. the distance in a straight line and at the same altitude. This works fine on the sea where you can travel in a straight line on a flat surface, but on the land it won't accurately tell you the distance because it cannot take into account the extra distance you have to travel by going up and down slopes or walking around obstacles. The only way to accurately measure the distance on land is to actually walk it and record your track - the saved track will show you how far you travelled. You can look up this distance before you set off the next time.

## Track Information

There are 2 kinds of track in the GPS - the `Tracklog` and the saved tracks.

The `Tracklog` is the one currently being created which is using up the GPS memory. When you save it it becomes a saved track.

Saving a track loses some of the information in the `Tracklog`. You will notice this when you download it into the computer.

A saved track will show you the altitude and the total distance travelled.

The `Tracklog` is called the `Active Log` in the software. As well as the altitude and distance it can also tell you what your speed was and what time it was at any position on the track.

When the GPS saves a track it also reduces the number of dots or points that make up the track, there are many more points in the `Tracklog` than in a saved track (you'll see this if you look in the `Properties` window for `Number of points`)

When you try and load a `Tracklog` track back into your GPS you may find it doesn't have enough room for it. You can get round this problem by reducing the number of points in the `Properties` window - just click the `Reduce` button until the number of points is under 100, it should then load in without problems.



## Choosing a Position Format

In the same way that you can tell the GPS unit how to display information in a variety of different ways, you can get the software to do the same. Choose `Mode > Units` to choose between Nautical, Statute and Metric measurements, and pick a position format from the `Mode > Position Format` menu which gives the option of degrees, degrees and minutes or degrees minutes and seconds. Note that it will display it the way you want it regardless of what units the GPS is set to display.

## Storing and Retrieving Your Data

A collection of waypoints, tracks or routes can be stored in the computer as a single overlay file. When this overlay file is loaded back into the program, all the waypoints, routes and tracks will reappear on the map. If you then load in another overlay file it will add another set of stored waypoints etc. to your overlay. These will now be mixed together in the overlay shown on your map but the original overlay files on your hard disk won't be changed.

To load an overlay file from your hard disk go to `Overlay > Import` and choose which overlay file you want.

To save an overlay file you can either choose to save everything

```
Overlay > Export All
```

or you can save only certain parts of the current overlay shown on your map. You do this by hiding the bits you don't want to save and then choosing

```
Overlay > Export Visible
```

For instance, you might have several tracks and waypoints currently loaded, but you only want to save the waypoints as a separate file. In this case you will go to

```
Overlay > Hide All > Tracks
```

Now you only have the waypoints visible you can save them as a new overlay file by choosing the `Export Visible` command.

You can choose only certain waypoints to save by hiding all the ones you don't want in the `Properties` screen. If you only want to save a few it might be quicker and easier to just hide everything and then make the ones you want to keep visible by ticking the `Visible` box in the waypoint `Properties` window.

If you want to delete anything from the currently loaded overlay, you can either delete everything (`Overlay > Delete All`), or hide the ones you don't want to keep then going to `Overlay > Delete Hidden`.

For instance, you might have a hundred waypoints and half a dozen tracks visible on your map. Only ten waypoints and 1 track are around nightingale; the rest are around Tristan. If you wanted to save the Nightingale data as a separate file, you could hide all the Tristan waypoints and tracks so that only the Nightingale track and waypoints are visible. You can then save these as a file called 'Nightingale data' by choosing `Export Visible` from the `Overlay` menu. If you have no use for the hidden items you can get rid of them from your current overlay by choosing `Overlay > Delete Hidden`.

## Editing Your Waypoints

You can edit the information on each waypoint - lat / long, symbol, name of waypoint etc. - by examining it in the `Properties` window and simply typing in the changes you want to make. This is easy if you're editing one or two waypoints but can become tedious if there are many that you want to change. Fortunately there is an easier way to edit them which also lets you store them in a separate file which can be used in a Word document or Excel spreadsheet.



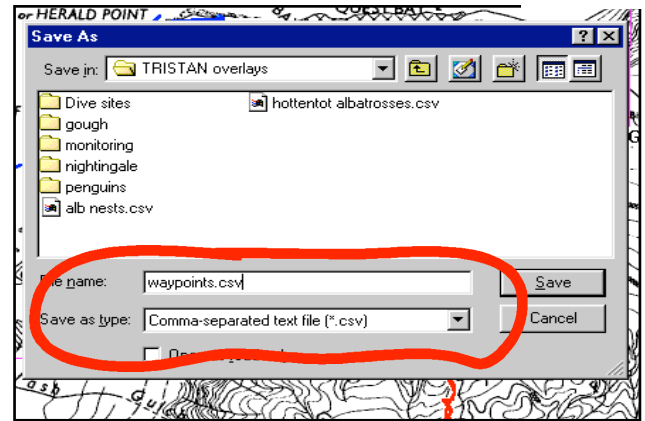


## Exporting waypoints as a .csv file

When you want to save the waypoints visible on the screen, you save them in exactly the same way as before i.e.

Overlay > Export All                      or  
Overlay > Export Visible

However, instead of saving the file as a normal overlay file (with .mmo file extension), this time you need to change the file type to something called 'comma separated values' which has the extension .csv.



## Editing the csv file

A csv file can be opened in a word processor or spreadsheet program where it can easily be edited. Once it has been changed to your liking it can be imported back into the mapping program again, as long as the file format (.csv) and the layout is unchanged.

The layout of the csv file is a little strange but most of it can be ignored when editing your waypoint names or positions. Below is an example of an overlay file containing 6 waypoints which has been exported as a csv file and then opened in Excel:

	A	B	C	D	E	F	G	H	I	J	K	L
1	WP02	-37.063917	-12.313306	0	WP01			0	0		1	0
2	WP02	-37.064639	-12.323977	0	WP02			0	0		1	0
3	WP02	-37.073354	-12.325122	0	WP03			0	0		1	0
4	WP02	-37.078272	-12.338725	0	WP04			0	0		1	0
5	WP02	-37.083538	-12.339573	0	WP05			0	0		1	0
6	WP02	-37.071638	-12.281615	10	BGH			0	0		1	0
7												

Column A - this always says WP02. Do not change it.

Column B - latitude in degrees and decimal degrees. Negative value means south.

Column C - longitude in degrees and decimal degrees. Negative value means west.

Column D - symbol. Different numbers represent different symbols (10=flag, 0=dot, etc)

Column E - waypoint name

Column F - comment (if any)

Column G - file path of any linked file (if any)

Column H - alarm radius (for when the program is being used in a boat as a plotter)

Column I - show label: 1=hide label, 0= show label

Column J - name on GPS (if empty the name will be the same as in column E)

Column K - visibility: 1= waypoint visible, 0=waypoint hidden

Column L - locked: 1=waypoint locked, 0-waypoint not locked

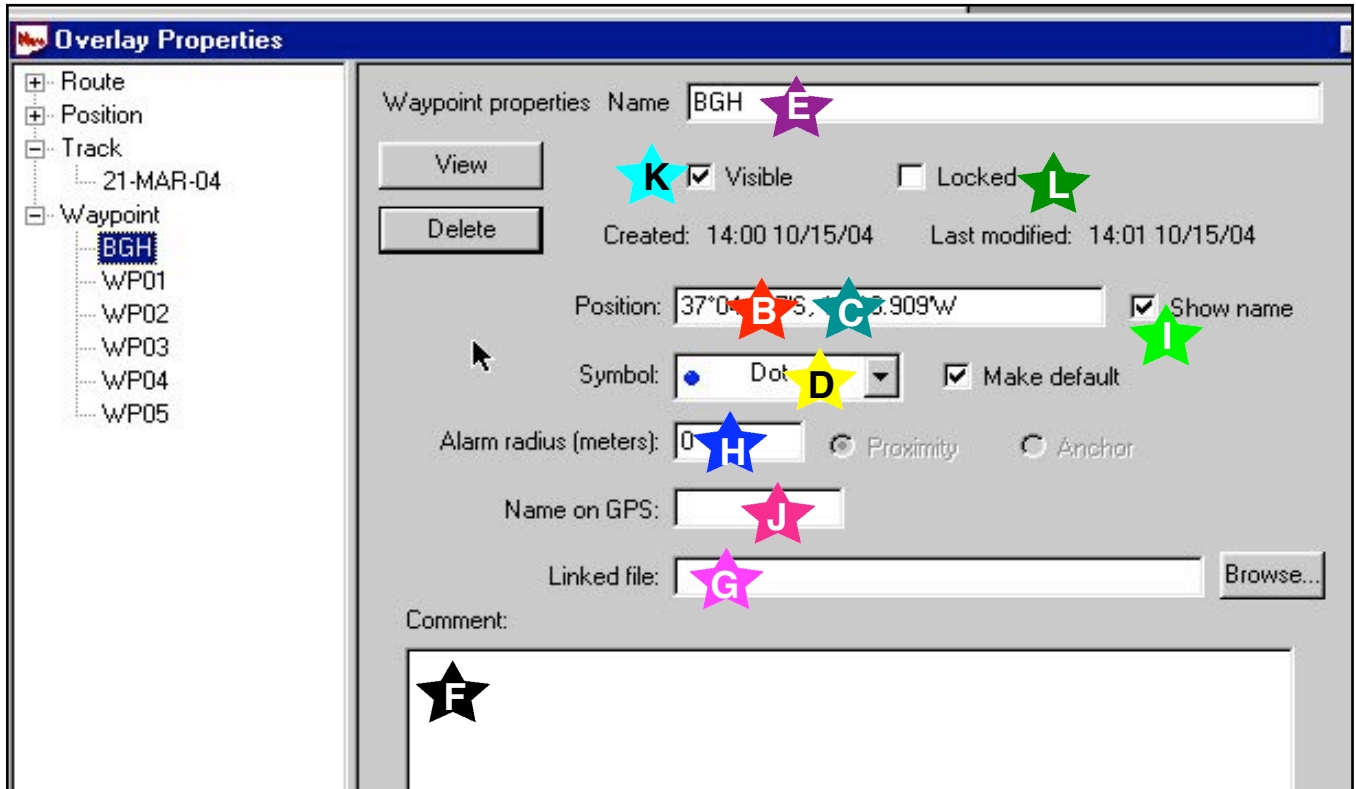
This method is not only useful for editing waypoints that have been downloaded from your GPS into the memory-map program, it can also be used for putting written GPS coordinates into the program and displaying them on your map or chart. This method is also very useful for extracting the coordinates of positions from your GPS and printing them out, or putting them into a report without having to write them all down first.

**NOTE!** If the position you are using is in degrees and minutes and / or seconds then use the file LATLONG\_CONVERT.XLS to convert them to degrees and decimal degrees.



## How to change a lot of waypoints in one go

Instead of changing each waypoint's details in the overlay properties window one at a time, it is much quicker to use the export > csv format method:



The Overlay Properties window. Each item that can be changed is marked with a star, and corresponds to the columns in the Excel file shown below.

Get all the waypoints you want to change showing on the map screen.

Choose *Overlay > Export visible*, choose a name for the file and and save it as a .csv file.

Open your csv file in Excel or a word processor

	A	B	C	D	E	F	G	H	I	J	K	L
1	WP02	-37.063917	-12.313306	0	WP01			0	0		1	0
2	WP02	-37.064639	-12.323977	0	WP02			0	0		1	0
3	WP02	-37.073354	-12.325122	0	WP03			0	0		1	0
4	WP02	-37.078272	-12.338725	0	WP04			0	0		1	0
5	WP02	-37.083538	-12.339573	0	WP05			0	0		1	0
6	WP02	-37.071638	-12.281615	10	BGH			0	0		1	0
7												

Make your changes and save the file again, remembering to keep it as a .csv file

Go back to Memory-map Navigator and load the waypoints back in using *Overlay > Import*, choosing your newly saved csv file.

That's it! You can resave the overlay as a normal .mmo file if you wish.

### Going Further

If you want to know about other features in this software please refer to the Help topics in the Help menu. Here you can find out how to scan and calibrate your own maps and charts, how to link picture files to waypoints, and how to use the software as a chart plotter when used on the move.