Documentation
English

(c) Thomas Flemming, Touratech AG
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Introduction

Introduction

First of all...

This program has been made for people who are able to find their way in unknown territory even without Touratech QV and a GPS.

GPS and PC-programs are certainly a great help in navigation. It can save time and effort but you should never forget that technology can fail.

Your GPS unit or laptop may fail and even Touratech QV may produce errors despite the fact that we have taken the greatest care when programming this software.

Please interpret the results you get from Touratech QV with a healthy dose of skepticism. Please bear in mind that the coordinates that QV gives you can never be more accurate than your map and that even sophisticated GPS receivers can produce incorrect results and bad receiving conditions.

What is Touratech QV ?

Basically, Touratech QV is a software for navigation and trip-planning with a GPS and digital maps.
QV will run on any Windows NT/2000/XP PC or laptop. With some minor restrictions QV will also run under Windows 98SE/ME.
And this are the main features:

- It displays your own scanned maps in a map window.
- You may also select from a large number of calibrated digital maps which are ready-to-use with Touratech QV. Maps CDs and DVDs of various types are available for many continents and countries with a great degree of accuracy (see www.ttqv.com > Shop).
- Waypoints, routes and tracks can be created by simple mouse clicks and are automatically stored in the integrated database.
- Using a serial or USB interface cable you can transfer data to your GPS unit and start your trip immediately.
- Your trip will be plotted automatically on the map and information on date and time as well as course and speed are given at each trackpoint. You will always know when and where you have been.
- Using a laptop or tablet-PC in your car, Touratech QV will show your current position on the map an plot and store the track during your journey without capacity limitations.
- The integrated geographic names database is a powerful tool to locate places within a radius of 10 km even if they are not marked at all on your map!
- You can print any section of a map including all data in a user-definable scale and an optional grid overlay.
- At any point on earth, Touratech QV will calculate the magnetic declination from geographic North.
- Without specific cartographic knowledge, you can calibrate a (scanned) map if this contains a grid of degrees of longitude and latitude. QV also supports UTM, Swiss and French (IGN) grids. It also contains more than 60 map projections and more than 140 map datum types. You can also define a user-specific grid and map datum.
- QV can handle a very wide range of various map formats
- QV is compatible with any GPS receiver that supports the Garmin protocol but also with GPS units manufactured by Magellan, Lowrance and Eagle. In the GPS-online mode, QV will work with any NMEA compatible GPS receiver.
- QV supports waypoint symbols.

- QV also creates maps in a Garmin-compatible format and can upload these maps directly in Garmin GPSMAP plotters.
- An intelligent graphical map overview makes it much easier to manage your maps and keep the overview.
- The integrated QV *X-Plorer* is a powerful tool similar to the Windows Explorer for managing all your data.
- QV offers professional remote- and multitracking features in the Power User or Professional version.

Copyright, licence conditions and warranty

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The detailed licence conditions are specified in the appendix.

Novelties in QV 4

Vector maps:

- Compatibility with Garmin IMG map format: read, write and GPS upload.
- DXF files can now be imported as maps (Davinci, emf) and will automatically be calibrated (lat/lon).
- SHP files can now be opened as a map.
- New QVM vector format which can combine several SHP files in a single file including attributes.
- All vector maps can now be overlaid on raster maps, even more than one at a time.

Raster maps:

- Compatibility with Bayo Edition 3 maps (french topographic maps)
- New grid format QTL
- Compatibility with ECWP maps from webservers

AutoNEW:

- Creating routes with the new options *Street Routing* and *Altitude Profile*.
- Creating Tracks with the new option *Altitude Profile*.

Multi-XY-Diagram:

Now several tracks or routes possible at a time. Automatic Update if tracks or routes are changed in the *X-Plorer*.

User interface:

Much more functions now executable by a simple drag & drop.

New track processor for a flexible analysis and evaluation of tracks.

GPS online:

- New touchscreen mode for an ergonomic operation during driving.
- Defining new targets now possible relative to the actual position using a Cap,Dist function.

GPS:

- New "Auto Detect GPS" function which will search and automatically detect all Garmin, Magellan and NMEA-compatible GPS units connected to COM or USB ports.
- Under *Properties - GPS-Namecheck* the GPS characteristics can now be edited. *QV* will store these settings separately for all models used.

X-Plorer:

- Many fields in the *X-Plorer* listing window can now be edited as you know it from MS Excel.
- Pop-up menu: The function *Open with Filemanager* is now available with all files and directories.
- Pop-up menu: The function *Open with...* will open the standard program of this file type with all maps.
- Column range: New Pop-up window, columns can now be moved or deactivated, sorting criteria can now be performed by a simple mouse click.
- Info field now available also for tables and databases.

Multitracking with *QV Power User* and *Professional*:

- SMS Configuration: Now allows for a Sending and Receiving of SMS messages via a local GSM modem, for example to configure our *Microtracker* models.
- TCP port: New *Listen Port HTTP* switch which provides a mini-webserver on this port in order to process HTTP data and extract the positions arriving from our *Microtracker GPRS* or the *Sanav*

Webtrac4.

Multi-Trackreplay for comparing and analyzing several tracks which have been recorded simultaneously, i.e. a race with several competitors.

Event recorder which works vehicle-specifically and allows for a user-specific definition of events and corresponding actions.

And much more.

New product line

With the introduction of QV4 a new structure of the product line has been implemented:

In order to decrease the gap between the professional high end licence and the standard version, the new "Power User" edition has been launched to provide experienced user with a functionality similar to the "Professional" version. However, multitracking capabilities of QV Power User are restricted to the remote-tracking of 5 objects and non-commercial applications.

The following table gives an overview of supported functions and differences between the available QV versions.
You find a complete list on our homepage and in our web-shop.

	Light	**Standard**	**Power User**	**Professional**
Serial number identifier	xxxxx-L	xxxxx-ST	xxxxx-PU	xxxxx-PRO
Geographic database	-	yes	yes	yes
Up / Download of GPS data	yes	yes	yes	yes
Import of Garmin-IMG maps	yes	yes	yes	yes
Export and Upload of Garmin-IMG maps	-	yes	yes	yes
Interface to Google Earth	-	yes Single-JPG Capture	yes Multi-JPG Capture	yes Multi-JPG Capture
Max. number of map windows	1	3	5	10
Roadbookeditor	-	optional	yes	yes
Static routing with optional vector-maps	-	yes	yes	yes
XY-Diagrams	-	yes	yes	yes
Dynamic routing and Voice-guided navigation	-	optional	optional	optional
Interface to Pathaway software	-	yes	yes	yes
Remote- and Multitracking	-	-	yes, 5x non-commer-cial use only	yes, 1x, optionally unlimited (subject of multitracking options)
Multitrackreplay	-	-	yes	yes
SHP as maps, QVM-Format, ECWP, QTL	-	-	yes	yes
Configurable GUI	-	-	yes	yes
Commercial use permitted	yes	yes	yes, except multitracking	yes

Overview on the available Navteq maps with routing capabilities:

Map type	Light	Standard	Power User	Professional
Main streets Europe	-	yes	yes	-
Detailed Maps "Routing" (static routing)	optional, map display only (no routing)	optional	optional	optional
Detailed Maps "Navi" (dynamic routing incl. voice-guided autorouting)	-	optional	optional	optional
Detailed Maps "Pro" (commercial use and remote/multitracking)	-	-	-	optional

You find a complete list on our Homepage > Shop.

Installation of Touratech QV 4

Installation of QV

If you have an older QV version please make a complete backup of data *before* you start the QV 4 installation procedure. **You must not install QV4 in your old QV 3 directory!**

Content of your QV-CD

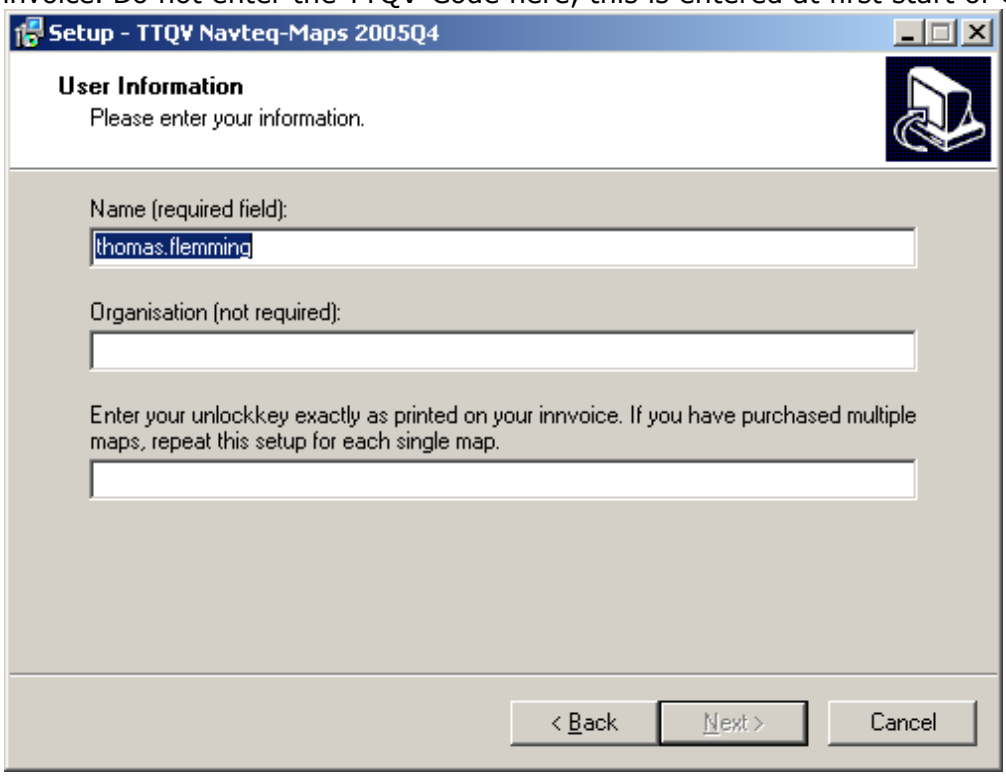
You will find the following directories and files on your QV CD:

\OD2*.*	In this directory you find the geographic data base
\WORLDMAP*.*	In this directory you find overview maps of each continent and basic maps of each country. The maps are calibrated and ready to use with *QV*.
\QVNDEMO*.*	In this directory you find samples of our maps on Canada and Africa. The maps are calibrated and ready to use with *QV*.
\EXTRAS\ECW	Setup program for the ECW-Bibliography. Please install this program if you want to load *ER-Mapper* maps in the ECW format.
\navteq_eubasemap *.*	here you will find the Navteq EuropeOverview map. **You need an unlock key to install this map which you will find on your TTQV-invoice.**
\EXTRAS\SAMPLE.QU4	This directory contains Airports_Worldwide.QU4 which is a database with the coordinates of more than 13000 airports worldwide. Please note that we cannot guarantee for the correctness of these data! Simply copy this file to your QV4 directory.
\EXTRAS\ACROBAT	Setup program for the Acrobat Reader. If the Acrobat Reader is not already installed on your PC, execute this setup in order to open your QV manual.
QV4SETUP.EXE	Main setup program for QV to install all options from the CD on your PC.

Installation

- Open your QV-CD and start the **QV4SETUP.EXE** file by a double-click.
  Read the licence agreement and confirm with yes if you accept the terms.
  If you disagree with the licence agreements you cannot install Touratech QV.
- In the next window the following points are listed:
- Specify the path to the QV program installation or accept the default "C:\Programs\TTQV4".
- Select the components to be installed from the provided list.
  To install QV, at least "Software Touratech QV 4 " must be marked.
- Optionally the following components may be installed:
  - worldwide geographic database, the continents can be separately selected
  - basic maps of all countries
  - demo film clips in the flash format
  - Navteq main roads of Europe
  If you want to save hard disk space you can skip these options. You may install them later on from the CD at any time. Please note that you will need a specific unlock key for the Navteq map which you will find on your invoice in case that you bought this map (available separately or as a part of QV).
- In the next window you will be asked if you want to install the Acrobat Reader in order to read the QV manual online. The QV help files will also function without the Acrobat Reader. Furthermore you can install the ECW Active X Controls which you will need to read *ER-Mapper* maps in the ECW format. If you do not use ECW maps you can skip this option.

- After summarizing all selected options, the installation process will start.
- When you selected the **Navteq Europe Overview**, another setup will start. During this, you must enter the unlock-key for the map. This key looks like xxxxx-yyyy and is printed on your invoice. Do not enter the TTQV-Code here, this is entered at first start of QV.



After this, the TTQV-setup continues.

- If you accidentally selected the installation of the Navteq map without having an unlock-key you can simply abort this special installation routine. The QV installation will finish without problems.
- Depending on your Windows version and other installed programs, a restart of your PC may be required to finish the installation procedure. Please follow this instruction.

Starting QV and entering your licence data

After finishing the installation, you may directly start QV 4. Otherwise you can also start the program by double-clicking the QV 4 icon on your desktop.

If you have purchased a registered licence please enter your licence data in the main menu under *? > About.. / Enter Licence... > Enter Licence*. Please enter all licence data exactly as printed on your licence document (upper and lower case spelling and blanks in every field of the mask are important!). Click *Save* to finish the entry.

If you do not enter any licence data, QV 4 will run for 25 days in the demo-mode without functional restrictions.

Please note that licence codes from older QV versions will not work with QV 4. If you purchase a QV 4 upgrade you will automatically receive a new QV 4 code.

Optional parameters for starting QV

Optionally QV can be started using one of the following parameters:

ONLINE	This will start QV directly in the GPS online mode using the latest settings
ONLINETOUCH	This will start QV directly in the GPS online mode with the touchscreen user interface
MT_START	This will start QV in the multitracking mode

Debug	In this mode QV automatically creates a text file named "debug.txt" with useful information for the QV Support-Team. Please mail this file to support@ttqv.com if you are asked for.
Lang=X	This will start QV in a specific language. X may be set to e (English), d (German) or f (French).
file.ext	In this case QV will directly open the map **file.ext**. *File* may be any map entry from the QV *X-Plorer* or a *.SKL-file which you created earlier using the function **Status Maplayer Manager - Save**.
ini=datei.ini	This will start QV with an alternative configuration (instead of ttqv4a.ini).

All these parameters may be saved in the *Properties* menu which you can access clicking with the right mouse button on the QV 4 icon on your desktop.

You will find additional options for starting QV if you refer to "AutoStart data base".

Removing older QV versions

After successfully importing your maps and data from older QV versions, you can remove this older version from your system. Please use the Windows procedure under *system control > software* for this purpose. This procedure will vary with your Windows version, details are therefore not described here.

In some cases it may happen that the uninstallation process removes files which are also used by QV 4. In this case just run the QV 4 setup another time and QV 4 will then work correctly.

Before you manually remove your old QV directory from your disk, please ensure that QV 4 has no links referring to this directory. Maps, the geographic database or GPS data might be affected. You can easily check this by marking these items in the QV *X-Plorer*. You will find the linked path in the corresponding field on the lower right part of the *X-Plorer* screen.

Upgrade and import of existing data

QV 4 features some new functions and options which also affect the database. The format of the database has been expanded and thus all earlier database versions have to be converted once to the new QV 4 standard.

The extension of all database-files is now *.QU4. Therefore all database files can easily be associated with the corresponding QV-version.

Automatic import of existing data

The easiest way is to use the command "Import QV 1.x, 2.x, 3 database..." from the *X-Plorer* database menu:

- QV4 will automatically search for existing installations of QV 2.5, QV 3 and EasyRoutes.
- All database files from the QU2 directory of QV 2.5 will be copied to the QU3 directory of QV 4 and automatically converted. So all data from the original QV Data directory are transferred to QV 4.
- Subsequently, all connected directories are being read and the database files are copied to the default name with a QU4-extension and the linked path in QV 4 is updated.
- All DEMs, VMIs, user-specified map datums and grids are also imported to QV 4 and so the import of existing data is completed!

With the first start of QV 4 after the installation process the import of existing data is automatically executed.

Manual import of existing data

Using this option, database files of even older QV versions can be imported, e.g. a QV 2.0 or QuoVadis 1.62 / 1.5 database. Those databases are named map.mdb.

For this purpose two commands are available:

1. In order to convert several QU2 / QU3 database files, the command **Import QV 1.x, QV 2.x, 3x database...** from the *X-Plorer* database menu is available. Choose the QUx-database or a map.mdb file and QV will convert it to a QU4 file which will be assigned to the current directory.

   You can also import a *.QU2 / QU3 or a *map.mdb* file into a new database with a single command:

- Open the *X-Plorer*.
- Select the directory *QV data*.
- Click *Database* or *Import new map* .
- Choose **Import QV 1.x, QV 2.x, 3. Database** from the menu.
- In the following file selection dialog you choose the QU2 / QU3 database or the *map.mdb* - file from the directory of your choice and click **Open**.
- QV will then create a new database under *QV Data* to which all selected data will be copied. The old database will not be modified. By default, the name of the new database will be created according to the path and file name. However you can change this in the *X-Plorer* window if you wish to.

2. If you choose **New Connection**, QV will automatically search for older database files which may be converted automatically in one batch.

- In any case the new database will contain all data of the map.mdb file in one map-, waypoint-route- and track-table, respectively. All data are now ready-to-use.
- Please note that maps are not copied. In order to save hard disk space they remain at the identical path than before. Your directory structure will remain unchanged.

- The older database version will not be needed by QV 4.

Quick start

Where do I find help?

Touratech-QV features a comprehensive and multiple-stage online-help.

- Beginners should start with *Getting Started...* and the demo-video clips. In these chapters the basics of QV are being described.
- You can access context-specific helpfiles at any time by pressing **F1** or by choosing **? > Topic** from the main menu.
- The online-help also offers an extensive index in order to access quick help to a specific topic.
- You can also print the online-help from the PDF file which is located in your TTQV4 program folder or download this file from our homepage.
- A list of frequently asked questions and answers can be viewed at this web link http://forum.ttqv.com/viewforum.php?f=20.
- If you need additional help, please contact our support forum at http:\\forum.ttqv.com. Here you will get a quick and competent answer to your questions.

Conventions used in this manual

Bold characters refer to menu points or buttons. Example: **Options - Settings**

Italic spelling refers to comments which will appear when you point with the mouse button on a specific icon or when referring to names of paths, etc.

Important instructions and comments are placed in a box which may be color-coded in order to accentuate the message:

This box contains an important remark or hint.

This box contains a highly important remark. Ignoring this remark may result in a loss of data!

A Button of a toolbox is indicated by the corresponding icon. Example:

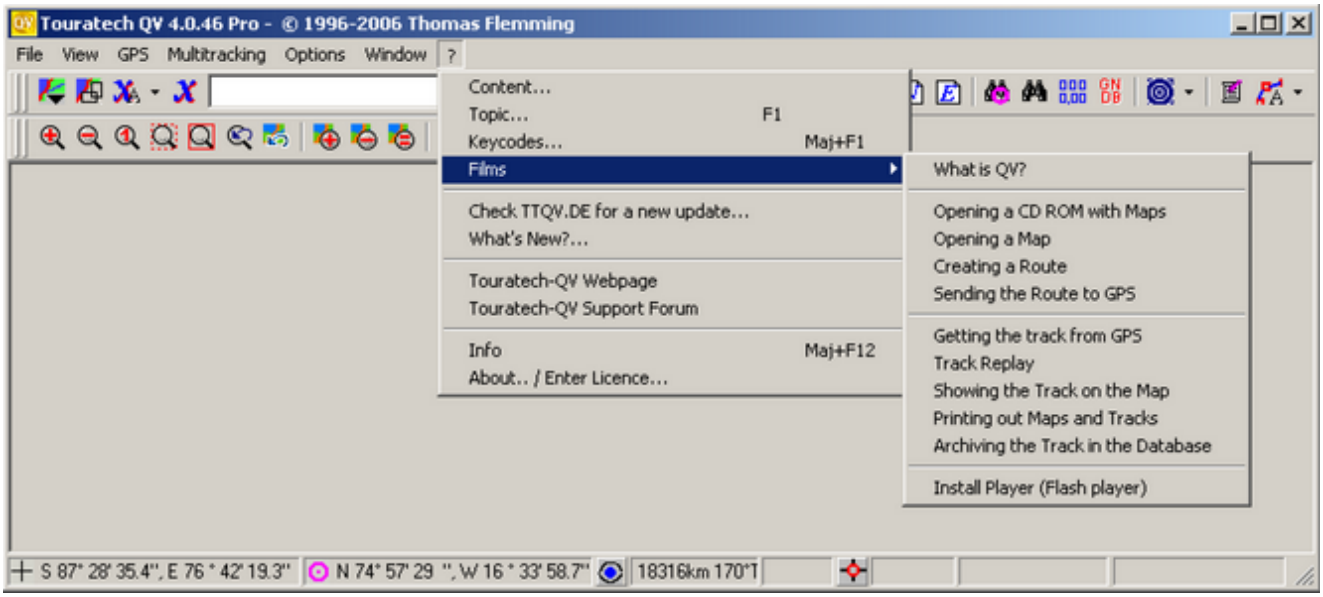
Please note that a screenshot may have been taken from an older QV-version. In this case the functionality has not been changed.

In this manual all functions of the various QV-versions are described. ***Please note that your specific QV-version may not support all described function!***

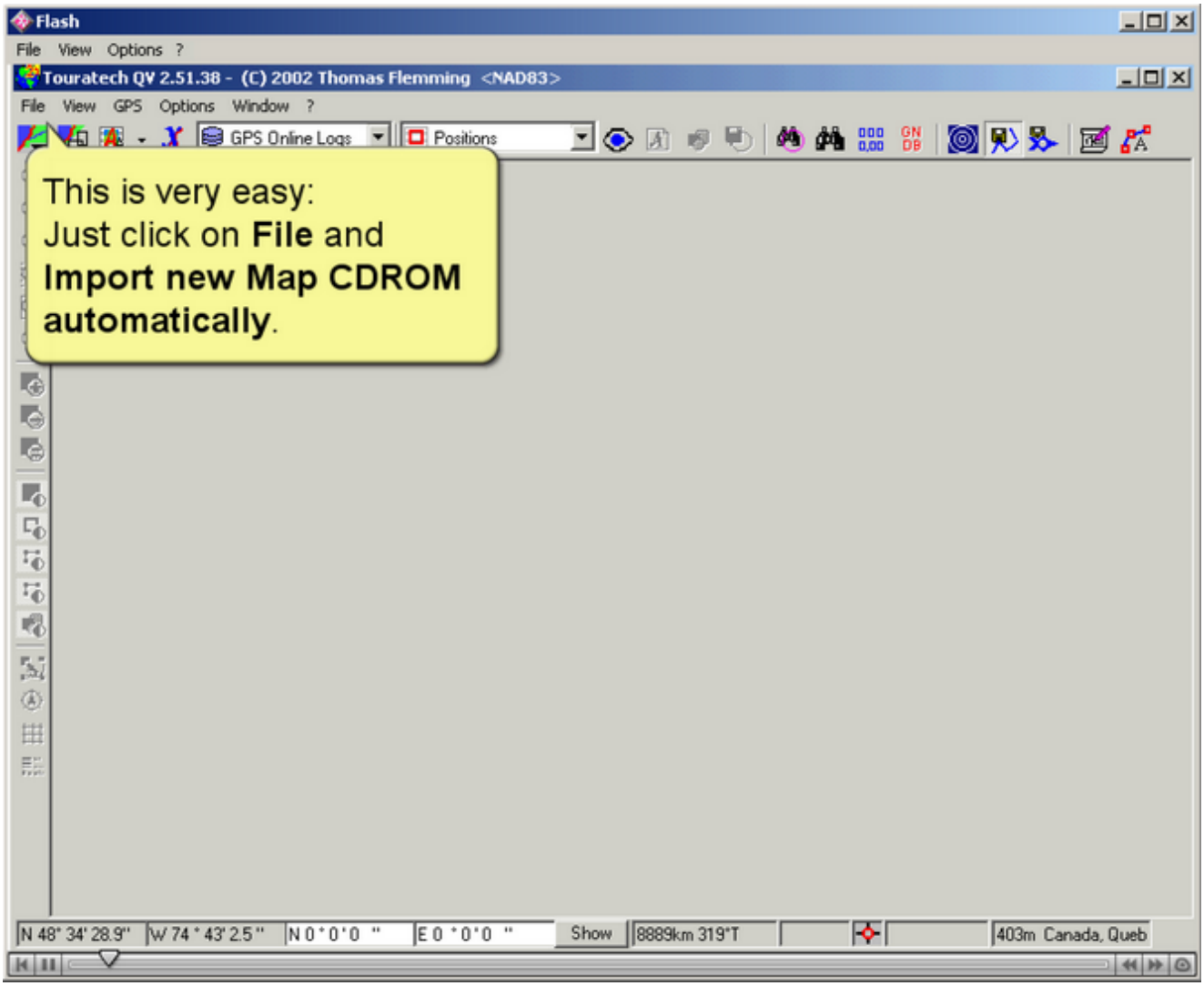
You find an overview on the supported functions of all versions in the chapter New Product Line and also on our homepage.

QV demo video clips

Under **? - Films** you will find some video clips which will demonstrate basic QV functions and which will help you to familiarise with QV. Currently 9 video clips are available which cover more or less the content of the Getting Started... chapter of this manual.



Just start the clip by choosing the desired title. Your movie-player will start automatically and the movie will start.



Use the buttons at the button of the screen to control the replay of the video clip, just in the way you do this with your video or tape recorder:

The functions are assigned (from left to right) as follows:

|< Skip to the start
|| Pause
> Play
<< Rewind
>> Fast forward

You can also skip to any spot by drag-and drop the triangle with the mouse to the desired position.

Installation of the video clips

During the QV installation (running QV4SETUP.EXE) you are asked if you want to copy the video clips to your hard disk. If you disabled that option when installing QV you will have to insert your QV-CD into your floppy drive to watch the clips.

Movie-Player

The video clips have been produced using MacromediaFlash 5 (file-extension *.swf). If you have a compatible movie player installed, this will automatically be used by QV.

Otherwise you can install a movie-player for these clips by selecting **? - Films - Install player (Flash player)** from the main menu. Please note that QV will not modify any registry settings on your preferred movie player.

Getting started ...

First steps in QV

In this chapter the most important functions of QV are introduced and quick start instructions are given.

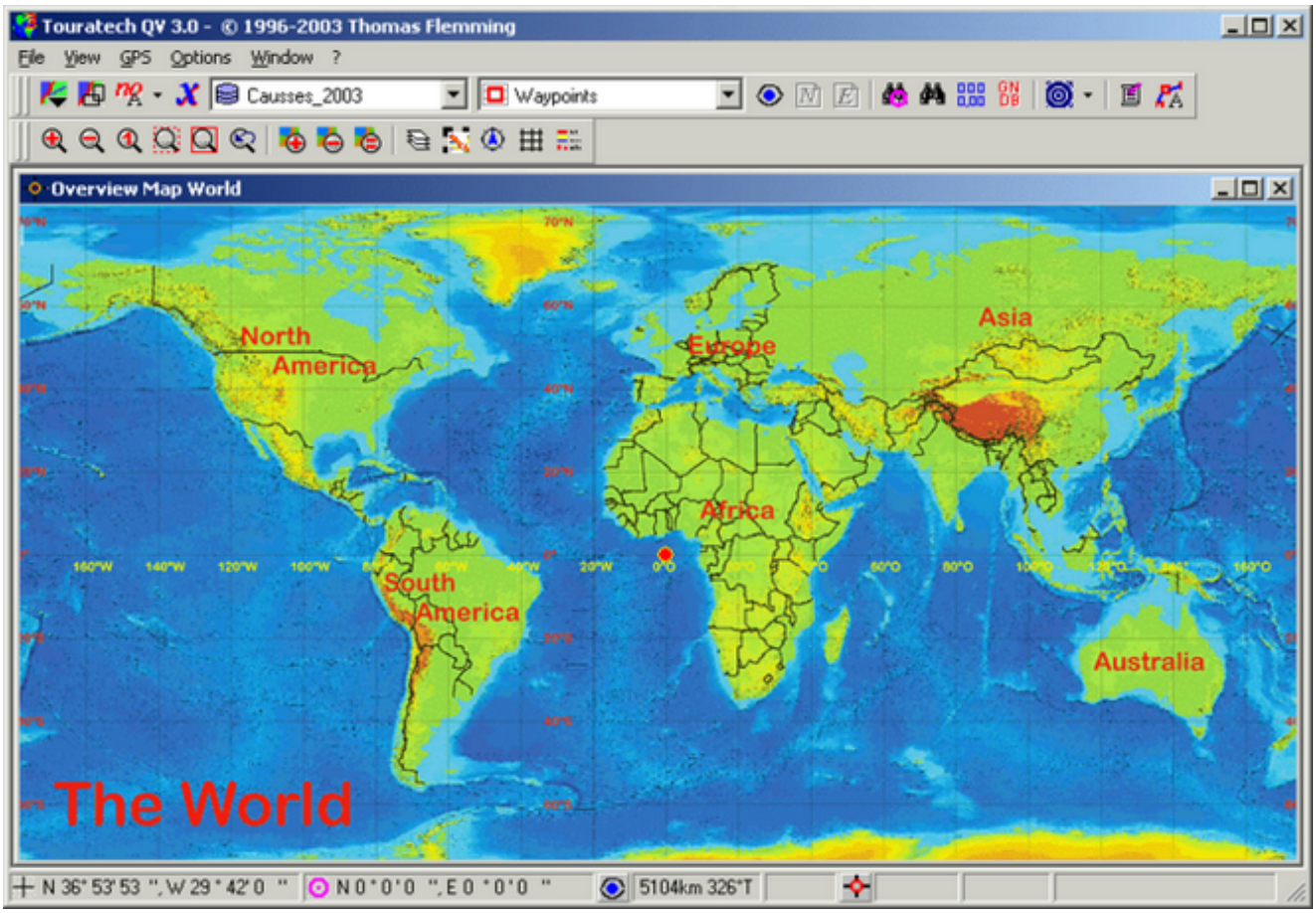
You will find step-by-step instructions to the most important tasks, for example to create a route, open a map CD. Cross reference are given to chapters where you find detailed information.

Please also have a look at the video clips which will give an on-screen-demonstration of the basic functions. Choose **? - films** from the main menu and select the topic in order to watch the video clips.

After program installation, start QV by clicking the - icon from the start menu or by a double-click on the icon on your desktop.

Main program window

After starting the program, the QV main window will appear with an world map in the overview window.



The main window features all important elements to operate QV:

- The main menu bar with the pull-down menus **File**, **View**, **GPS**, **Multitracking**, **Options**, **Window** and **?** (= help)
- Horizontal below the symbol bar with the most important functions like *Open a map*, *Switch map - overview*, *AutoMap mode*, *X-Plorer*, *Show in Map, AutoNew* for creating Waypoints, Routes and Tracks, *Edit, Search* (2 options), *Units, Open Geographic Database, GPS Online, Roadbook Editor* and *Street Routing.*

- Horizontal below another symbol bar with icons for controlling the look of the map window such as *Zoom* (in/out/100%/entire map/previous scale), show *Previous Map*, *Open Map* with larger/smaller/identical scale*, Map Layer Manager, Scale Indicator* (on/off) and *North Indicator* (on/off) and *Grid Overlay.*
- Horizontal at the bottom of the window the status bar which summarizes important information on the actual mouse and cursor position like the coordinates, the distance and bearing between mouse and cursor position, the magnetic offset or the name of the country. You will also find a *Show in Map* button there (center) and a button to switch between several crosshair designs.
- The actual window area is filled either with the *map window*, the *overview window* or the *X-Plorer*, depending on what you have opened in QV.

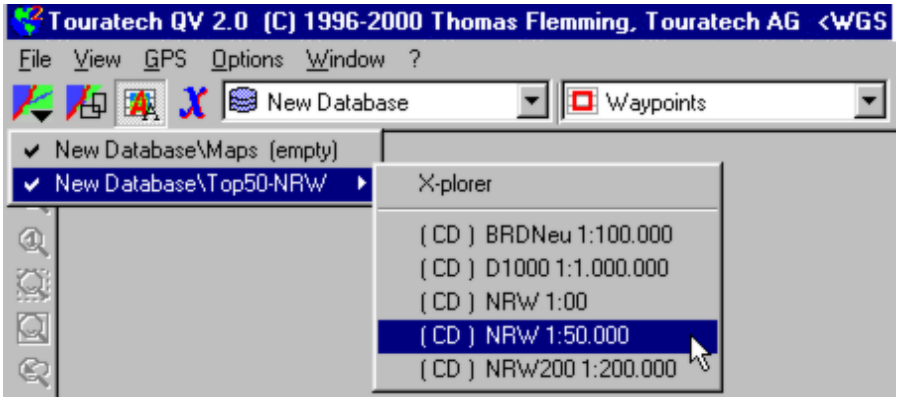
You will find a detailed description of all options in the chapter "Main Window".

Open a Map

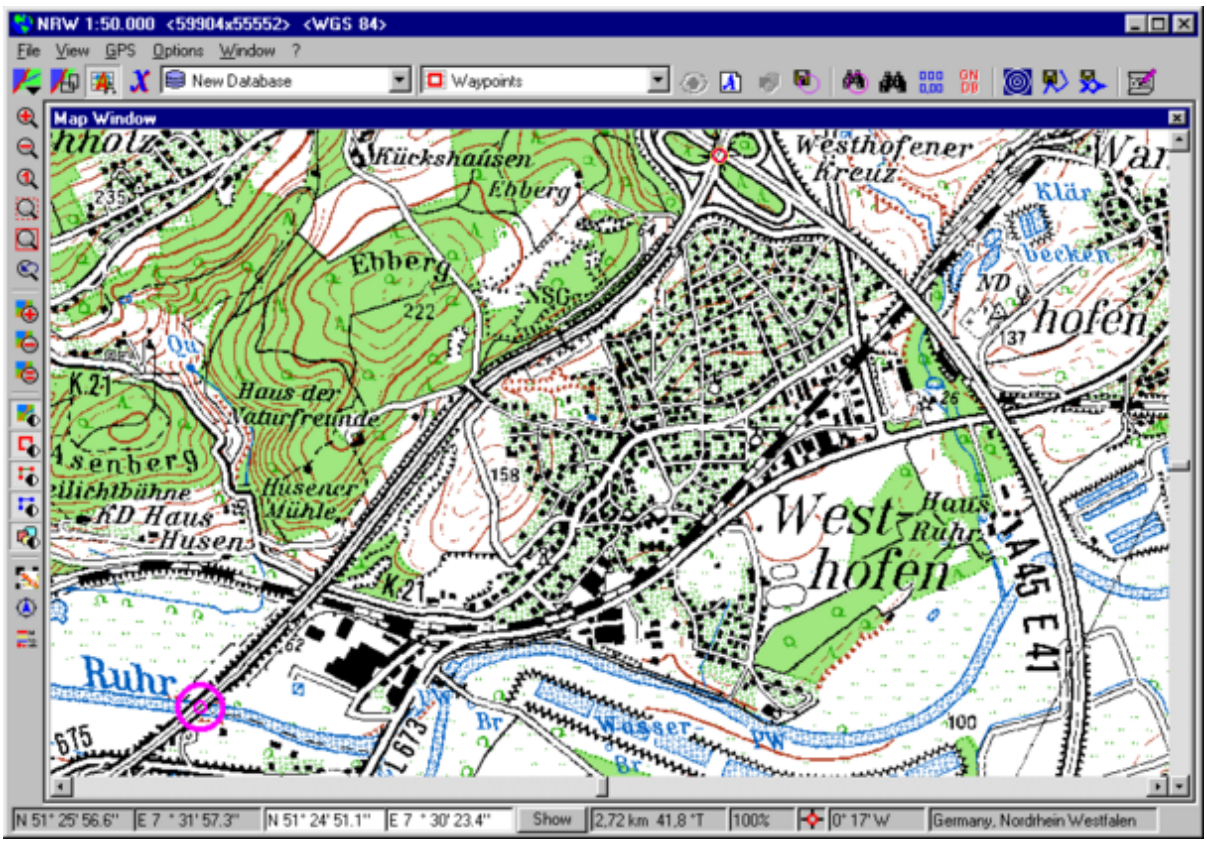
To open a map, click on the icon on the top left position of the symbol bar. A pop-up-menu will open and you can choose a from a list of available maps (see page 89 on how to import maps into *QV*). If no pop-up-menu appears, this may have two reasons:

- You may still have no maps installed. If this is the case, first install some maps: either the world maps included on your *QV* CD (see *Installation of QV*) or maps which you can buy separately (see *Opening Maps*) or existing maps from older QV versions (see *Import of existing data*). You can also scan and calibrate your own maps (see *Calibrating your own maps*).
- The *AutoMap Mode* (third icon from the left) is disabled and the icon looks as follows: . In this case click on the AutoMap icon in order to switch it to .

In the following example the CD "Top50 Nordrhein-Westfalen" has been imported:



The map window opens and the map will be centered in the map window.



Click at any spot of the map with the left mouse button, the *map cursor* (purple circle) will be placed at this position. The coordinates of this point will be specified in the white field of the status bar below the map window. In the grey field at the left shows the coordinates of the mouse indicator which are permanently updated as you move your mouse over the screen.

In the field right of the *Show in Map* button the distance and direction from the map cursor to the mouse position is continually updated.

Use the horizontal and vertical windows scroll bars in order to move the map within the window. You can also drag the map within the map window by click, hold and move with the left mouse button.

Click on the *Show in Map* button to skip back to the cursor point from any map position.

With six lens icons you can zoom the map to any scale or map extent. You can also select from a pop-up menu with zoom factors at the status bar below the map window or enter a specific zoom factor.

If you click on the crosshair symbol in the status bar you can choose one from six mouse pointers in the map window: crosshair (standard size), crosshair (big rectangular shape), GPS North, magnetic North, grid and magnifying glass.

You find a detailed description of all options in the Map Window chapter.

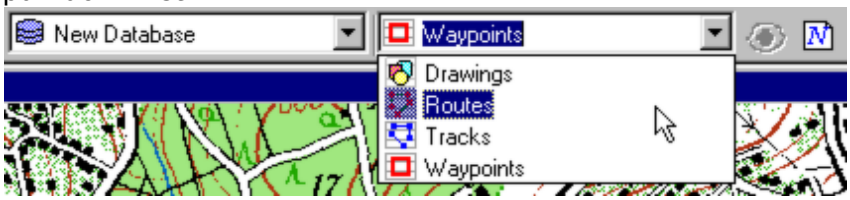
Create a route

First of all some theory:

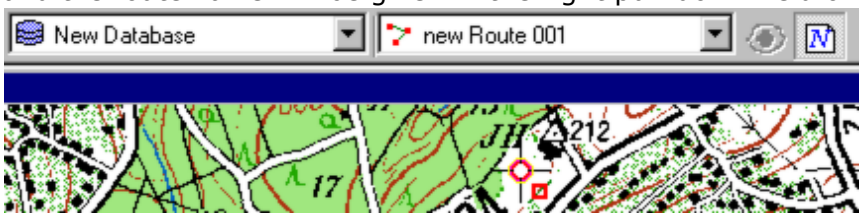
A route is a list of waypoint, connected in a specific order. A waypoint is a distinctive place on earth. It consists of geographic coordinates and a user-defined name, e.g. a house or a road-crossing. A GPS-receiver will define its own position and will guide you to the next waypoint by showing the direction and distance along the beeline. If you reach this point the GPS-receiver will automatically skip to the next waypoint of the route. By an intelligent planning of a route on your PC at home, you can later on find the best way out in the real world by foot, with your vehicle, your boat or plane. Your GPS unit will exactly lead you to the waypoints which you defined on your map with the PC.

But how to proceed?

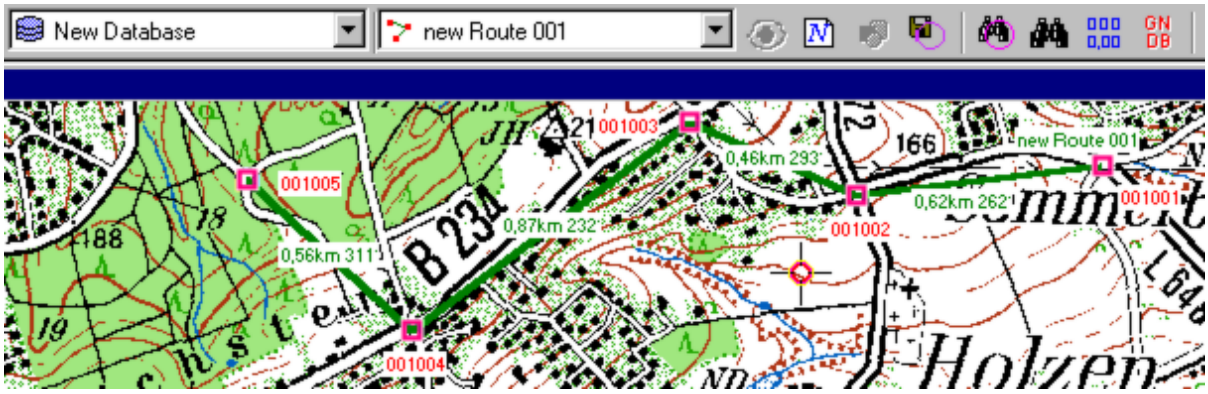
- Click in the fields of the symbol bar at the top and choose *New Database* and *Routes* from the pull-down list:



  By this you have defined where QV will store your new route, i.e. in the database named *New Database* and within this database in the table named *Routes*. These are the default names which you can later on change however you wish to. So you can create as many databases and tables as you like and name them according to your preferences. However you have to define in advance where the data should be created. This is due to the fact that QV organises all data in a professional database.
- Now click the AutoNEW icon in order to create the new route.
- A box will appear in which you have to specify a name for the new route. By default QV will suggest *new Route 001*. You can accept this default or choose your own name.
- You will find a 3 digit prefix for Waypoint names in the same box. This prefix is used as the first three characters for all waypoints of this route. The naming of the waypoints starts with this prefix which will be followed by consecutive numbers. The prefix default is the number of the route, so in this case 001.
- Ignore the other options and click ok.
- Now the mouse pointer changes in order to indicate that every new click in the map will automatically create a new waypoint for this route. The AutoNEW icon will be highlighted and the route name will be given in the right pull-down field of the symbol bar:



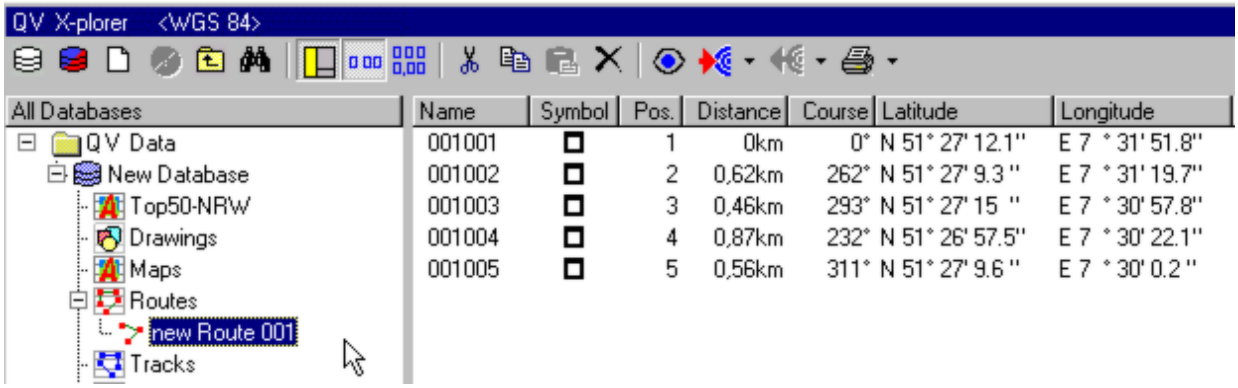
- Click at any point in the map window where your route should start. QV will create the first waypoint with the name *001001* and will indicate this point on the map with a small red square. The name of the route is plotted in green above the first waypoint.
- Now define the second waypoint by another click on the map. It will be named *001002*. You will also note that QV will connect the two waypoints with a green line and will calculate the distance which is plotted along the line.
- Define all other waypoints of this route until you arrive at your arrival point. Note that the length of all intersections will be given and the total length of the route will be updated above the first waypoint.
- Finish your route definition with a click on the AutoNEW icon. In the map window, the created route should look like this:



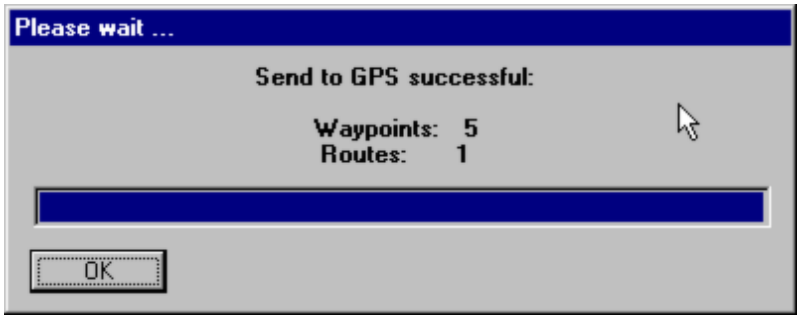
Upload of the Route into your GPS

Connect your GPS with the serial or USB cable with your PC and switch it on. You have to configure the interface to your GPS unit once in order to enable them to communicate. For this purpose please refer to the chapter *Connecting your GPS*.

- Thereafter open the QV *X-Plorer* by clicking on the icon.
- The QV *X-Plorer* is the basic tool to organise all your data. All stored data are listed there, they can be edited, renamed, moved or deleted. On the left part of the *X-Plorer* window, all database files and tables are listed clearly arranged in a tree-structure. In this *tree window* you can select an object of interest. On the right part of this window all elements of the selected object are listed in the *list window* and in the lower part all details of the selected element are given in the *detail window*.
- As an example, click on the new route in the left part of the *X-Plorer* window. It will be highlighted in blue. The route is now selected and all waypoints of this route are listed in the right part of the window:



- Simply click on the *Send to GPS* icon. After a short while the transfer of the route is finished:



Download of a track from the GPS

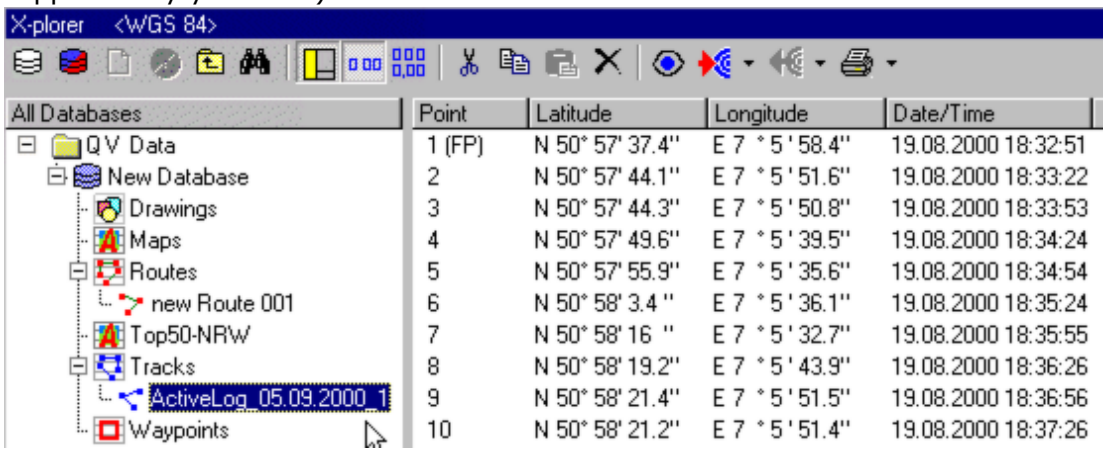
Similar to a route, a track is also a set of points in a specific order. However, in contrast to a route, the trackpoints are not named but only consist of geographic coordinates. Most GPS-units feature an automatic logging of trackpoints. These tracklogs can later on be transferred to an be stored in QV. In this way you can document on any map where you have been.

You can also express it in another way: The route is the theory of where you wanted to go and the track is the reality about where you have really been. You may have already learned that this does not have to be identical...

Please note that some GPS units will store additional information on time/date or altitude. If available, these data will also be downloaded to QV and can be analyzed.

To download a track from your GPS and store it in QV you have to follow these steps:

- Open the QV *X-Plorer* and click in the left part of the window on *Tracks*. by this, you have specified that the new track will be stored in the database named *New Database* and within this database in the table named *Tracks*.
  If you already defined several databases and various tables for tracklogs you should choose the adequate database and table to define where to store the new track.
- Now simply click in the *X-Plorer* symbol bar on the *Download Tracks from GPS* icon .
- The *GPS - Download* window will open with a couple of options which are described in detail in the chapter *Download of data from the GPS*. For the moment simply click *OK* and start the download. This may last quite a while depending from the amount of data and your GPS unit.
- Thereafter the new track will be listed in the selected track table and be named *ActiveLog_10.8.2000_1* (example).
- You can now click with the left mouse button on the track name and in the right part of the window all trackpoints will be listed together with date/time, speed, course and altitude (if supported by your GPS):

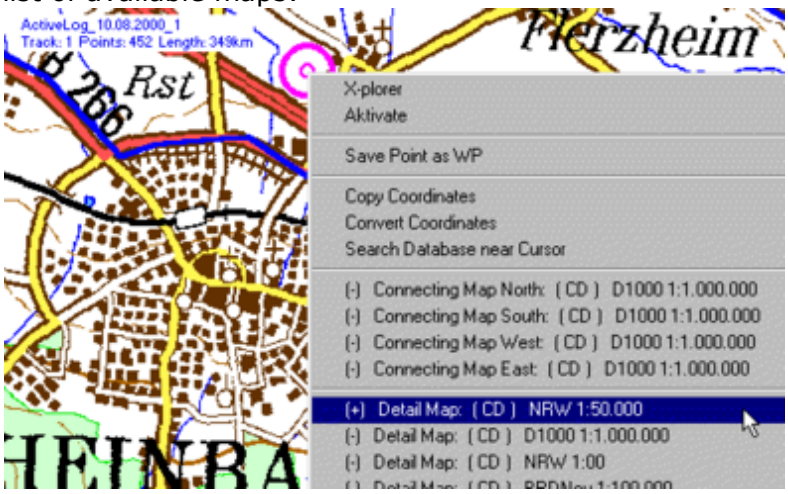


View a Track on a map

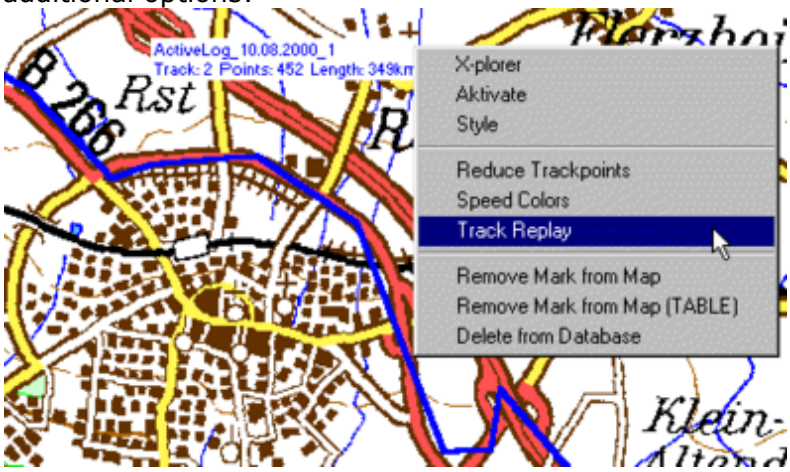
If you have marked a track with a left mouse-click, the icon *Shop in Map* is activated in the *X-Plorer* symbol bar.

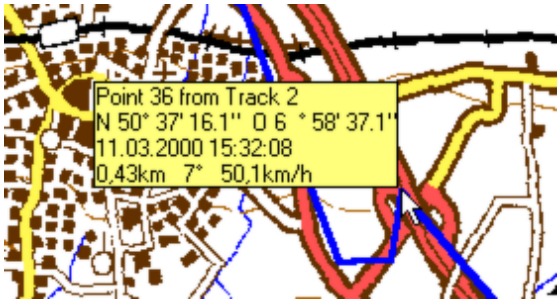
- Simply click this icon and QV will search for all available maps which will contain the first trackpoint. If more than one map is available, a pop-up window will open from which you can choose the desired map. If no map is displayed and no pop-up window opens there is no map available in QV which covers these coordinates. In this case you have to check the status of the *AutoMAP* function or you have to install a compatible map (see *Open a Map*).
- The map window will open and the track is plotted as a blue line. Adjacent to the first trackpoint the track name is documented together with the number of trackpoints and its total length.
- If you have several maps with different scales can switch between the maps and the track will automatically be updated and re-plotted. For this purpose just click with the right mouse

button close to the track. The purple cursor will be placed and a pop-up menu opens with a list of available maps:



- If you click on the track name with the right mouse button, another pop-up menu opens with additional options:



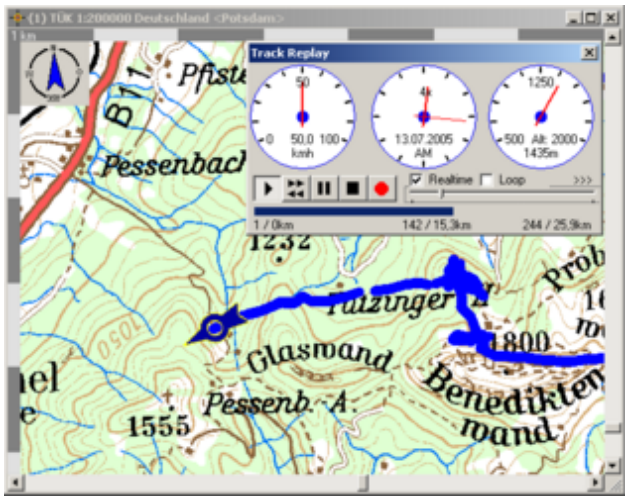


- If you choose *Speed Colors*, the track will be colour-coded according to the speed of the vehicle. By default red codes the fastest and blue the slowest speed.
- If you want to view details of a specific trackpoint, just move the mouse pointer on the trackpoint and wait for a second without clicking. A yellow info-box will open and list all available information about this trackpoint.

Track-Replay

QV features an animated track-replay function which allows for a replay of the track directly on the map in real time or fast motion.

- Click with the right mouse button on the track name and choose *Replay* from the pop-up menu:



- The track-replay window will open which consists of a tachometer, a watch, an altimeter and a couple of buttons to control the replay: *start*, *fast-forward*, *pause* and *stop* and *record*.
- Click *start* and watch the arrow follow the track on the map.
- With the speed indicator bar you can control the speed of the replay function, ranging from real time (left) to 1000 x fast motion (right).
- To stop the replay just close the track-replay window.

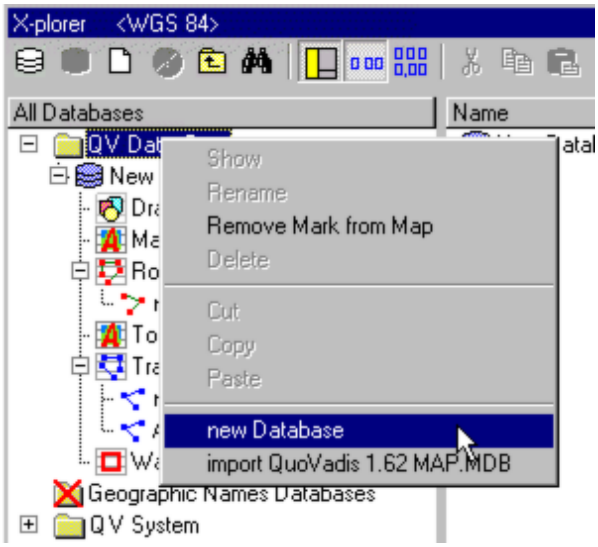
Archive the track in the database

As the track has already been stored and may be reloaded, plotted, replayed and printed at any time, this headline might be misleading. However you may wish to organize your tracks according to a systematic order, for example according to specific subjects, countries or whatever.

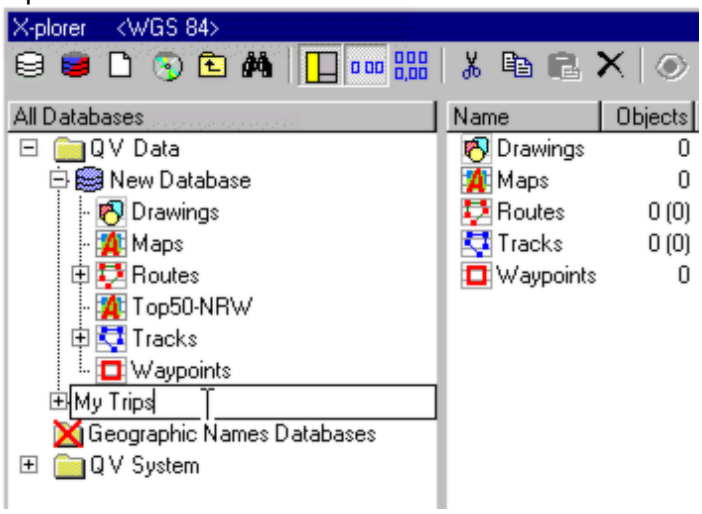
In QV all data are organized in database files which are located on your hard disk in certain directories and which consist of separate tables in which QV stores the data. You can create as many database files and tables as you like and assign your data to these tables. All this is done in the QV *X-Plorer*.

In order to reorganize your data, open the *X-Plorer* by a clicking on the icon of your symbol bar of the main window.

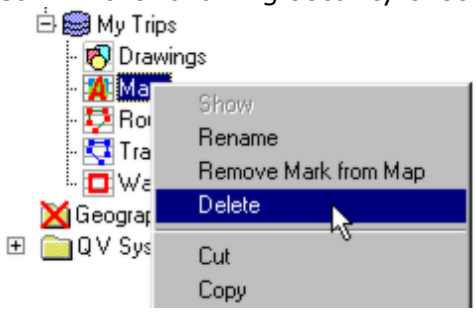
- Click with the right mouse button on the *QV Data* directory and choose *New Database* from the pop-up menu:



- QV will create a new database with the default name *New Database (1)* and inserts it with a textbox in the *X-Plorer tree window* at the adequate place. You can now directly specify a new name, for example *My Trips*. Push the Enter-button of the keyboard in order to finish your input:

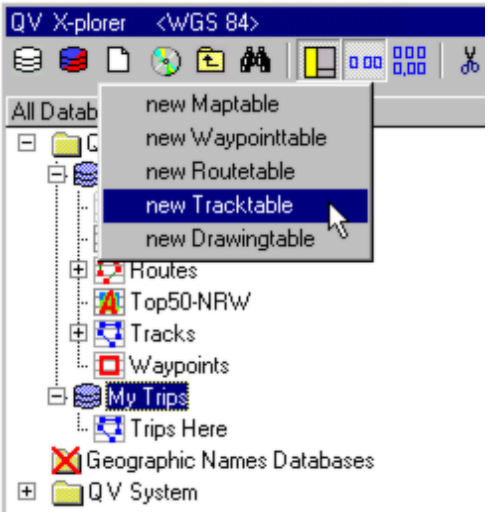


- If you click with the left mouse button on the small [+] besides the name of the database, the content will be listed. Each new database is created with some default table elements: one *Map* table, one *Waypoint* table, one *Route* table, one *Track* table and one *Drawing* table. The newly created database is intended to store tracks only, the other tables are not needed.
- For this purpose simply right-click on the *Map* table and choose from the pop-up menu *Delete*. Confirm the following security check with *Yes*.



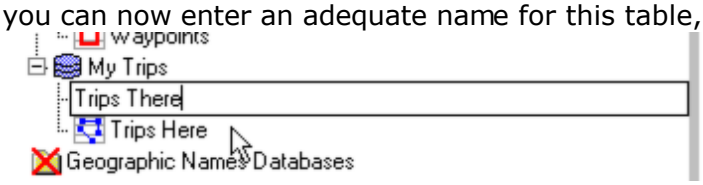
- Delete in the same way the *Waypoints*, *Routes* and *Drawings* table.
- Click with the right mouse-button on the *Tracks* table and choose *Rename* from the pop-up menu. Insert the new name, for example *Eifel Trips*.
- Mark the database named *My Trips* by clicking with the left mouse button.

- Click on *New Table...* in the Symbol bar of the QV *X-Plorer* and choose *New Track Table* from the pop-up menu:



(Another way to achieve this would have been a right-click on the database named *My Trips* and then select *New Track Table* from the pop-up menu).

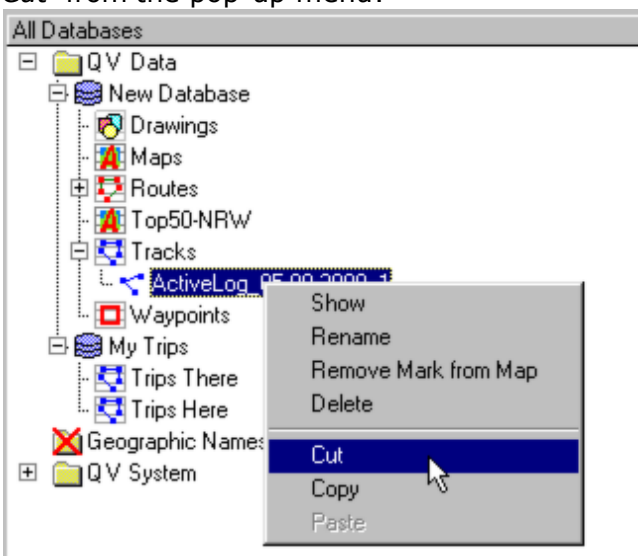
- QV will now create a new track table in the database named *My Trips*. As described above, you can now enter an adequate name for this table, for example *Trips There*.



Now you have already managed the basics: You have created a database which is well organised according to your trip destinations and will be used to store all tracks of your trips.

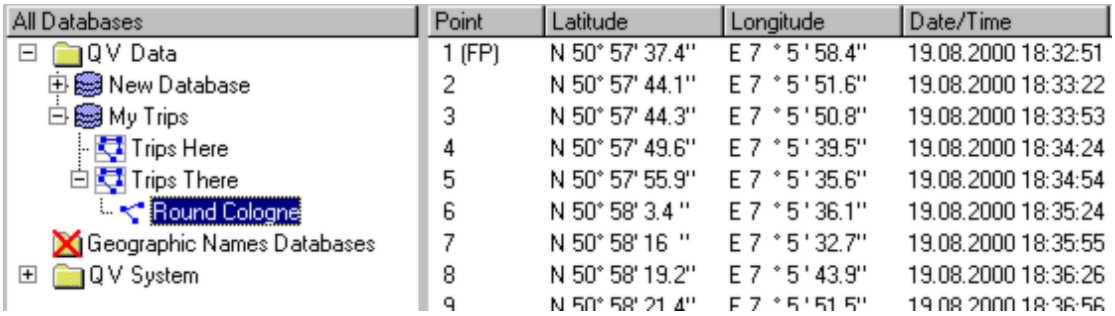
The only thing that is left is to move the tracks into this database. To do this with the track you already downloaded into the *Tracks* table of the your database *New Database* (see above) follow these steps:

- Open the database *New Database* and the *Tracks* table *by a simple left-click* with the mouse on the [+] icon of the *X-Plorer tree window*.
- Click with the right mouse button on the track named *ActiveLog_10.08.2000_1* and choose *Cut* from the pop-up menu:



- Then right-click on the table *Trips Eifel* and choose *Insert* from the pop-up menu. The track will be deleted in the old and inserted to the new table.

- Now you can rename your track, for example to *Trip on the 10-8-2000* and your *X-Plorer* window should look as follows:



Now, how to import your next track directly into the adequate table? This is very simple:

- Just click with the left mouse button on the track table named *Trips Sauerland*.
- Now click in the *X-Plorer* symbol bar on *Download Tracks from GPS* .
- As described above, the track will be transferred to QV and directly be stored with the name *ActiveLog_xxxxx* but this time directly in the selected table.
- All what is left to do is to give the track a meaningful name.

Organizing your data in databases and tables is described in detail in the chapter *Organizing your data with the QV X-Plorer*.

Print your track-plot on the map

Any map window can be plotted together with all waypoints, routes and tracks.
Just follow these steps:

- Plot all desired waypoints, routes and tracks in the map of your choice with the *Show in Map* function .
- Adjust the map to the desired scale and extent.
- Choose *Print...* from the pull-down menu of the main window.
- The *Print Map* window will open.
- Choose the *Page Preview* function and another window will open which will show how the print-out will look like with the current printer settings. You have several options to modify the printing result which are all automatically updated in the preview window in order to allow for a direct control of the selected changes.
- After everything has been adjusted just click **Print** and the map will be printed.

You find a detailed description of all printing options in the chapter *Printing*.

How to continue?

The chapter *Getting Started* has introduced the most important functions of QV.
You have opened and printed maps, created routes and uploaded them to your GPS unit and you downloaded tracks from your GPS. You learned how to organize your data in databases with the *X-Plorer*.
In the following chapters all functions are described in detail. However, in order to limit the volume of this manual we sometimes have to restrict ourselves to the main issues.
You will see that many functions follow the same general principles, so the basics are repeated for several times. For instance, it doesn't make a difference if you download waypoints or tracks from your GPS. You just choose a waypoint or track table as the adequate QV destination. The basic function *Download from GPS* keeps the same.
The same holds true for the functions *New Routes*, *New Waypoints*, *New Tracks* to create new objects on a map. This is always done with the *AutoNEW* icon . However, what you are going to create and where you are going to store it is simply defined by the table you choose in the QV

X-Plorer. For this purpose you can also choose the database and table in the two fields of the symbol bar in the main window which is just a "short copy" of the *X-Plorer* with pull-down menus:

In general you will find out that there are often several ways to execute a specific task.
Be advised to check the right mouse button frequently: many functions can be accessed from a pop-up menu after clicking with the right mouse button.

How do I perform a specific task?

In this chapter you find quick answers to questions which refer to tasks which have to be solved frequently. Also hints and references to specific chapters of this manual are given.

How do I import data from older QV versions?

How do I open maps?

How do I calibrate my own scanned maps?

A huge collection of frequently asked "Questions and Answers and Common Procedures" can be found in the FAQ-Section of our user and support forum at http://forum.ttqv.com/viewforum.php?f=20.

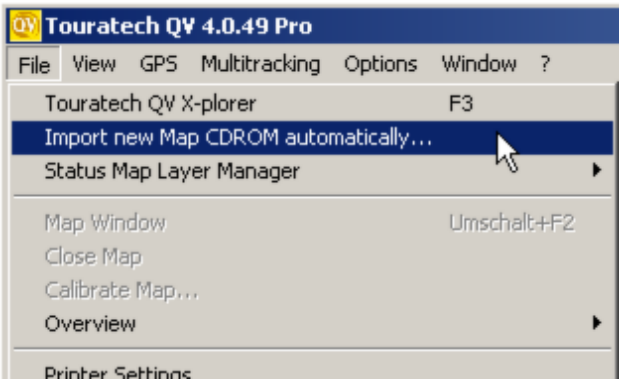
How do I import my data from older QV versions?

Older QV versions have stored all data in a database named *MAP.MDB*. You can import all these data in one batch into a new database.

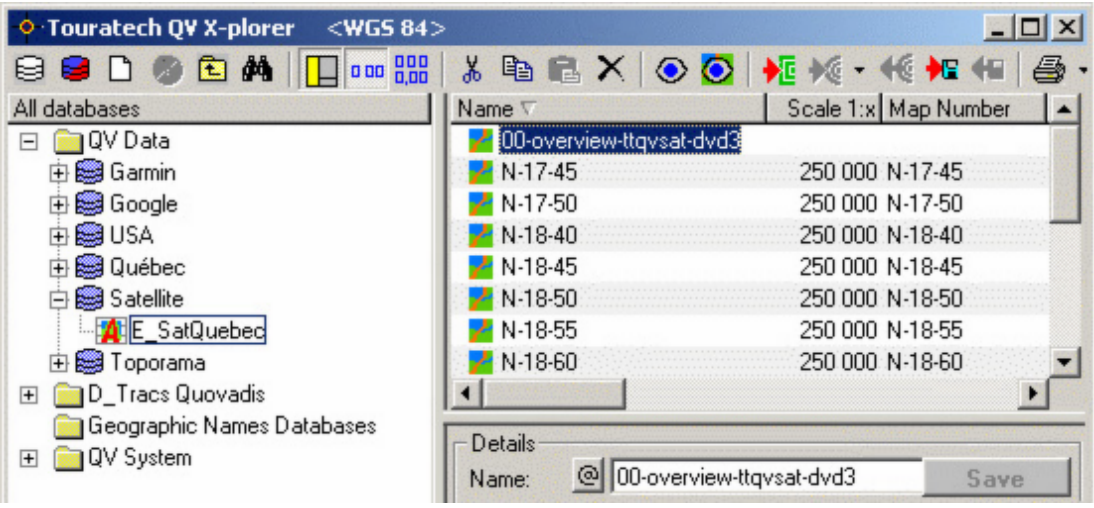
You will find detailed instructions in the chapter Upgrade and Import of Existing Data

How do I open a CD/DVD containing maps?

Insert the CD/DVD into your drive and choose *Import New Map CDROM automatically...* from the *File* menu:



The CD/DVD will be read and all maps which are compatible with QV will automatically be imported into the *X-Plorer* database *CDROM Maps*:

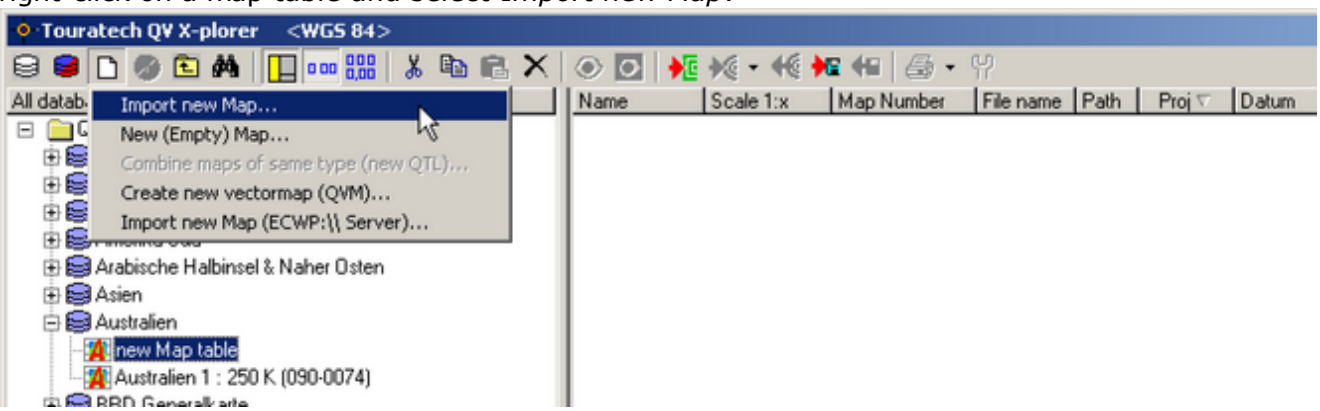


To open a map just select it in the list of the right hand *X-Plorer* window and click *Show in Map*

. You can also simply double-click on the map name.
Additional options are available with the function *Import Map CDROM or Directory* (see chapter Importing new maps into QV).

How do I open my own scanned map?

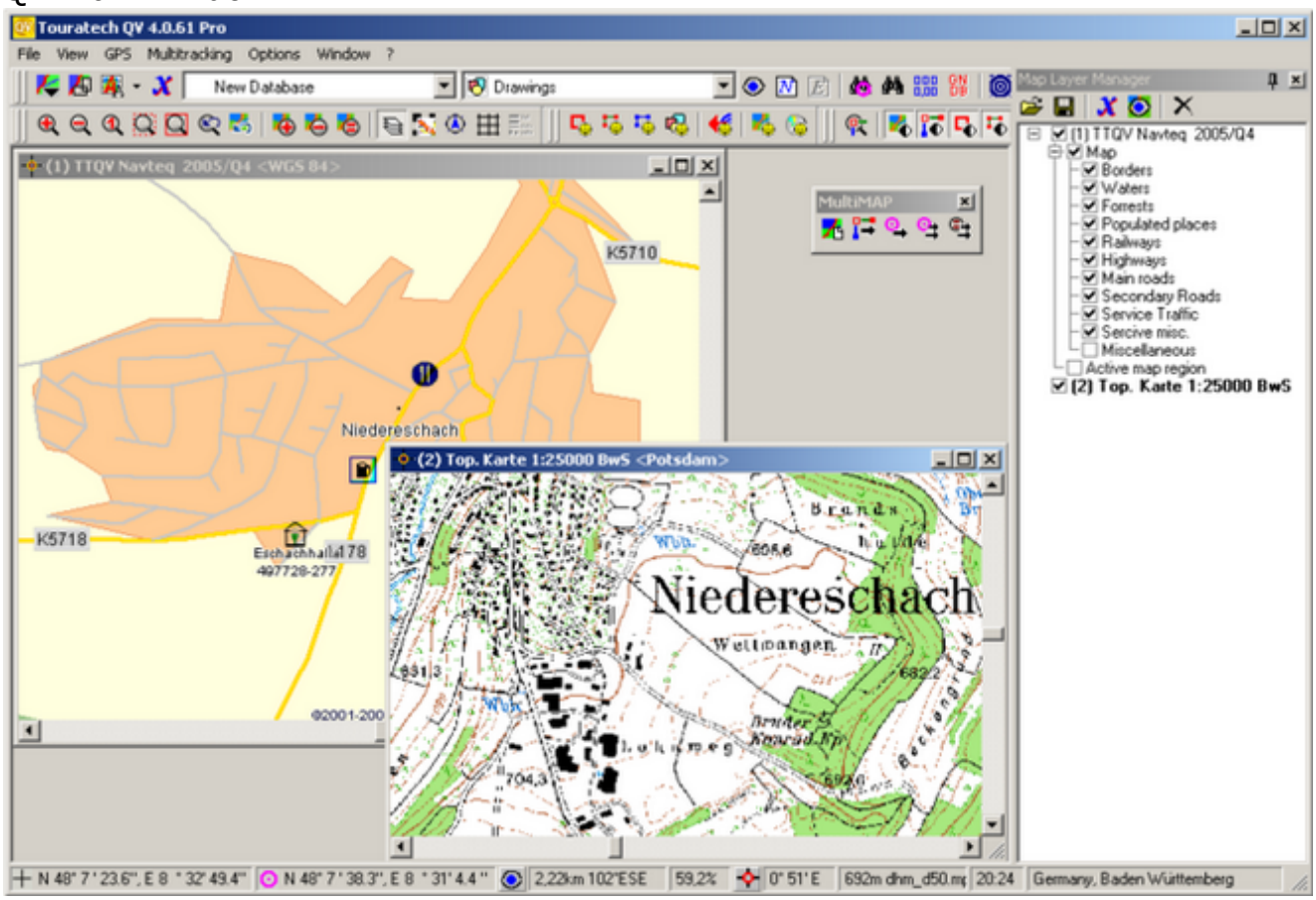
- Store the scanned map in a directory on your hard disk, for example *C:\Maps\My_Map.PNG*
- Start QV and open the QV *X-Plorer*.
- Decide in which database and which table you want to store your map. This is done by a simple click on the table of your choice in the *X-Plorer tree window*.
- Now you can either click on *New Table* in the Symbol bar or open the pop-up menu by a right-click on a map table and select *Import new Map*:



- In the following window you have to select the path and file name of your map, e.g. *C:\Maps\My_Map.PNG*
- Now the map and the calibration tool will automatically open. It is now depending on the map how the calibration has to be done. You find further information on this topic in the chapter Calibrating Maps.

QV main window

QV main window



The main window consists of the blue title line with the usual Windows buttons for minimising, maximising and closing. It can be moved around the screen, enlarged or reduced according to your needs. When you close the program, the last cursor position will be saved, when you restart *QV*, the last cursor position is reloaded.

The large gray central area contains all other *QV* windows. The most important are the map windows and the *QV X-Plorer* window.

The central area is surrounded by various symbol bars and you will find the pull down menu underneath the title line and the status bar at the bottom.

Many functions are initially disabled, i.e. the buttons are monochrome with a pale color. They become enabled after a map is loaded in the map window.

Some functions appear both in the pull down menus and also in the symbol bar for a faster access. Very important functions can also be accessed using a key on the keyboard.

The area within the window is "drop-sensitive" which means that you can drag and drop a map from the *X-Plorer* in order to visualize it.

The status line

The status line gives information on the position of the mouse pointer in the map window and map overview window, respectively. In total, it has nine fields:

1. Displays the coordinates of the mouse pointer which will be permanently updated with any movement of the mouse.
2. Displays the coordinates of the map cursor. The map cursor is indicated by a purple circle on

the map or a red point on the overview map and is placed by a left clicking on the map. If you click on this field, a dialog box opens for entering coordinates. In this way you can search for certain coordinates.

3. Click on this icon in order to show the point specified in field 2 on the map. *QV* will position the map cursor on this point. If necessary, a suitable map will be loaded first. If there are several map windows open and you click on the point while keeping the Ctrl key pressed, this point will be centered in all map windows.
4. Shows the distance and direction from the map cursor to the mouse pointer in the current units.
5. Shows the currently set zoom factor of the map. If you left-click in this field a pop-up menu will appear and you can select zoom factors from 5% - 500%. Available in the map window only.
6. Switches between various symbols to indicate the current mouse pointer position. Left-clicking in this field switches to the next pointer. Right-clicking switches to the previous pointer. There is a summary of the mouse pointers available in the chapter *Map settings*. Available in the map window only.
7. Shows the declination of the map cursor position from magnetic North.
8. Altitude at the current mouse position. See chapter "DEM".
9. Shows the country that the position of the mouse pointer is indicating. The display of this information can be disabled in the *Map Settings* menu.

Optionally you can enable a clock in the status line.

Coordinate and distance units can be changed at any time using the icon, e.g. to miles and UTM etc. Refer to chapter *Settings* for more details.

Commands

Menus

This table refers to the individual functions of the pull-down menus.

If "..." follows the menu notation, this indicates that another dialog box will follow (which may be cancelled with the **ESC** button without further consequences).

Many commands can also be accessed through a hotkey or an icon in the symbol bar. These are listed in the 2nd and 3rd column of the table.
In column 3 a **C** may be added. If this is the case, the icon will change its function when cleft-licking on it while the **Ctrl** button is held down.

File Menu

QV X-Plorer	F3	Opens the *QV X-Plorer* window. Choosing this function a second time will close the window. By this, as quick switching between the active map window and the *X-Plorer* is possible. See chapter *QV X-Plorer window*.
Import new map CDROM automatically...		Searches for a map CD/DVD in the CD drive and imports all suitable maps to the map table "CD_Volume_Name". If this CD/DVD has already been imported earlier, the *X-Plorer* will open the corresponding map table.
Status Map Layer Manager		**Saves** the status of all map windows with all loaded markings in a file with the extension *.skl.
Save **Load**		With **Load** these map layouts can be reloaded including all markings
Map window	Shift F2	Brings the map window to the front.
Close map		Closes the map window.
Calibrate map...		Opens the Calibrate map box in order to check or modify the calibration data for a loaded map. See chapter *Calibrating of Maps*.
Overview Off		Disables the map overview window.
Overview Europe, etc.		Enables the map overview window and loads the selected overview map.
Printer Settings...		Opens the standard windows dialog box for printer setup, paper size and format setting, etc.
Print...		Opens the *Print map* window featuring several options for printing the map including all markings. See chapter Printing
Export to Bitmap...		Opens the *Export to Bitmap* window featuring several options to export a map view including all markings to a bitmap file. See chapter Export to Bitmap.

Export map to PDA Pathaway...	Opens the window *Export Map to PDA Pathaway* featuring several options to export the map including all markings to Pathaway. See chapter Pathaway.
Edit text file...	Opens the integrated text editor to edit a text file. You can enter or delete text, clear lines, exchange text through the Windows clipboard or merge several files. During editing with the text editor, a special pull-down menu with specific editor commands will be available in the main window.
Exit	Will terminate *QV*, save all settings in the TTQV4a.INI file and exit the program.
1. ..... **. .....**	Quick access to the maps and SKL files which have been used most recently.

View Menu

Zoom 100%	1	Zooms the map to 100%, i.e. scales it to its original size, exactly as saved.
Zoom In	+	Zooms into the map, i.e. enlarges details.
Zoom Out	-	Zooms out from the map, i.e. will increase overview.
Zoom Selection		Zooms to a selected map extent. Left-click the first corner of the desired area, drag a rectangle to the other corner and click again.
Zoom whole Map	2	Reduces the map size so that it is completely visible in the map window. Very large maps are only reduced to 5% of its original size.
Zoom previous		Restores the previous settings for map extent and zoom factor.
Zoom previous Map		Replots the last map and restores the previous settings for the zoom scale and the visible map extent.
Open Map with larger scale	Ctrl +	Opens another map with a larger scale, i.e. a map with an increased level of detail. The map with the next larger scale relative to the current map will be opened.
	Alt +	Opens another map with a larger scale, i.e. a map with an increased level of detail. The map with the largest scale and highest level of details will be opened.
Open Map with smaller scale	Ctrl -	Opens another map with a smaller scale, i.e. a map which offers more overview. The map with the next smaller scale relative to the current map will be opened.
	Alt -	Opens another map with a smaller scale, i.e. a map which offers more overview. The map with the smallest scale relative to the current map will be opened for maximum overview.
Open other Map with same scale	F10	Opens another map with identical scale as the current map in case that another map type with the same scale is available.

Delete Marks

Waypoint Marks
Route Marks
Track Marks
Drawing Marks
All Marks

Removes all waypoint, route, track and drawing marks from the map. To make them visible again, they must be replotted in the *X-Plorer* one by one by clicking on the icon.
The elements will not be deleted from the database but only removed from the map.

All elements will be removed from the map.

Switches.

If highlighted, all waypoints, routes, tracks or drawings will be plotted on the map. If disabled, the corresponding markings will not be plotted.

Switch.

Will clear the map and plot all markings on a white background if disabled. When highlighted, the map will be drawn as usual.

Map Layer Manager — Switches the Map Layer Manager ON or OFF.

Scale F9 — Displays a scale bar on the upper and left margins of the map window with light and dark gray bars indicating the units. The scale changes will automatically adapt to the map scale and the current zoom setting.
A second click will turn the scale bar off again.

North Arrow F8 — A north arrow is displayed in the upper left corner of the map. The arrow shows the direction to true north, i.e. to the geographical North Pole at the position of the map cursor (purple circle).
A second click will turn the north arrow off again.
See *North, magnetic and geographic*.

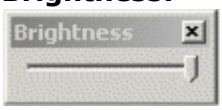
Grid — A grid overlay will be projected on the map with the current units and map datum. The distance between the grid lines is set automatically.

Map Legend... Ctrl L — Shows the legend key to the current map in an own window, if available. See chapter *Map Legend*.

High Quality Zoom Ctrl Q — Will increase plotting quality with zoom scales of less than 100%. However the time for map plotting will increase remarkably. Please note that this feature only works with Windows NT, 2000 and XP.

Fullscreen F7 — Maximizes the size of the *QV* main window by masking the symbol and status bar, so that as much space as possible is available for the map window.
Clicking once again restores the original window layout.

Kyrillic Alphabet... F11 — Shows the translation assistant for Russian maps. See *Russian ordnance maps*.

Night Screen	Ctrl D	Dims the screen and the map display, mainly intended for the use with the GPS online mode during night. See chapter Display types in the GPS online mode. You can adjust the luminance with the toolbox **Brightness:** 
Toolbars		In this submenu you can enable and disable all available toolbars. You can open the same submenu by a right-click on any toolbar.

GPS menu

GPS Online	F4	Starts the GPS online mode. During a trip, the current position will permanently be indicated on the map. By default the track will be recorded. Also see chapter *GPS online mode*.
Tracklog	F5	Determines whether or not the track should be saved during the GPS online mode. Also see chapter *GPS online mode*.
Save Position as WP	F6	Saves the current position during GPS online mode and during track replay. A new waypoint will be created in the *Positions* table of the *GPS online logs* database. Also see chapter *GPS online mode* and *Track Replay*.
Touchscreen Mode		Activates the Touchscreen mode in order to remove all irrelevant commands and elements from the screen and to maximize the map window. See chapter Touchscreen GPS online mode.
Autodetect GPS		Will automatically check serial and USB ports for connected GPS units. See *Settings GPS*.
Settings GPS		Opens the *Settings GPS* window. See chapter *Settings - GPS Online*.
Magellan		Accesses special functions for Magellan GPS units.
Trackpicker		Accesses special functions for the Trackpicker. See chapter Trackpicker.

Multitracking Menu (QV Power User and Professional only)

Start	F4	Starts Multitracking. See chapter Multitracking.
Stop		Stops Multitracking.
Configuration		Opens the dialog box for configuring Multitracking ports. See chapter Multitracking Configuration.
Status		Opens a logging window which lists all messages arriving through all ports.

Refresh Positions

Polls an actual position from all configured tracking units.

See chapter Multitracking Configuration.

GSM-Tracking

SMS Trigger Call

Dials the phone no. in order to download an actual position from the tracking unit via SMS.

SMS Configuration

Opens a dialog box to send an SMS code via a connected GSM modem in order to set or alter the configuration of a remote tracking unit.

See chapter SMS Configuration.

Options menu

Search Point by Coordinates

Opens the **Search a point** dialog box in which you can search all the maps for a geographical coordinate.
Also see chapter *Search by coordinates*.

Search by Name Ctrl F

Opens the *X-Plorer* **Search window** in which you can search all databases by name.
Also see chapter *Extended search with the search window*.

Roadbook Editor

Starts the Roadbook editor.
The Roadbook editor must be separately licenced. See separate *Roadbook Editor* documentation.

EasyNew

For a quick and easy creating of waypoints, routes or tracks. A special tool bar is available for this purpose:

See chapter EasyNEW.

GoogleEarth

Control bar for the Google Earth interface. A special tool bar is available for this purpose:

See chapter Google Earth.

Street Routing Ctrl R

Opens the Street Routing window to calculate a route automatically. See chapter *Street Routing*.

Calculate Route to Home point Ctrl H

Calculates a new route from the current position to the HOME point. See chapter *Calculate Route to HOME Point*.

Calculate Route from Home point

As above but in reverse direction.

Show HOME point in Map

Places the map cursor on the defined HOME point.

AutoMAP	Ctrl M	Switches between the four possible settings of the AutoMAP function. The icon in the symbol bar will change according to the corresponding setting. Disabled. *QV* will not search for maps. Actual map table only. AutoMAP will only search in the map table where the actual map is located. Actual database only. AutoMAP will search in all map tables of the data base where the actual map is located. Enabled. *QV* will search in all map tables which are labeled accordingly. Enabled. *QV* will search in all map tables. See chapter *AutoMAP*
AutoNEW	Ctrl N	For a quick and easy creating of waypoints, routes or tracks according to your current settings in the QV *X-Plorer* . See chapter *Creating new waypoints, routes and tracks.*
Edit	Ctrl E	Starts the editing of waypoints, routes and tracks. See chapter *Creating new waypoints, routes and tracks.*
Snap to existing Points	Ctrl S	If this function is enabled *QV* will automatically snap to existing points during editing of points or drawings.
Settings		Opens a dialog box with general parameters settings for *QV*. See chapter *Settings*.
Marks		Opens a dialog box with settings for color, font type and size for waypoints, routes and trackpoints. See chapter *Settings for marks*.

Window Menu

Arrange Windows	Ctrl W	Arranges all loaded windows overlapping.
Side by side		Arranges all windows side by side.
One below the other		Arranges all windows one below the other.
Side by side (Map Window)		Arranges all map windows side by side.
One below the other (Map Window)		Arranges all map windows one below the other.
Tiles (Map Window)		Arrange all map windows in a row or grid order.
Change size of map window...		Here you can enter a desired window size in pixel. Very useful for creating export files in a standardized size.
Size main window		Here you can enter a desired size in pixels for the main window. Very useful for creating screenshots in a standardized size.
1. ..... **2. .....**		Here all the currently loaded windows are listed with window titles. Selecting a window from the pull-down menu brings it immediately to the front.

? Menu

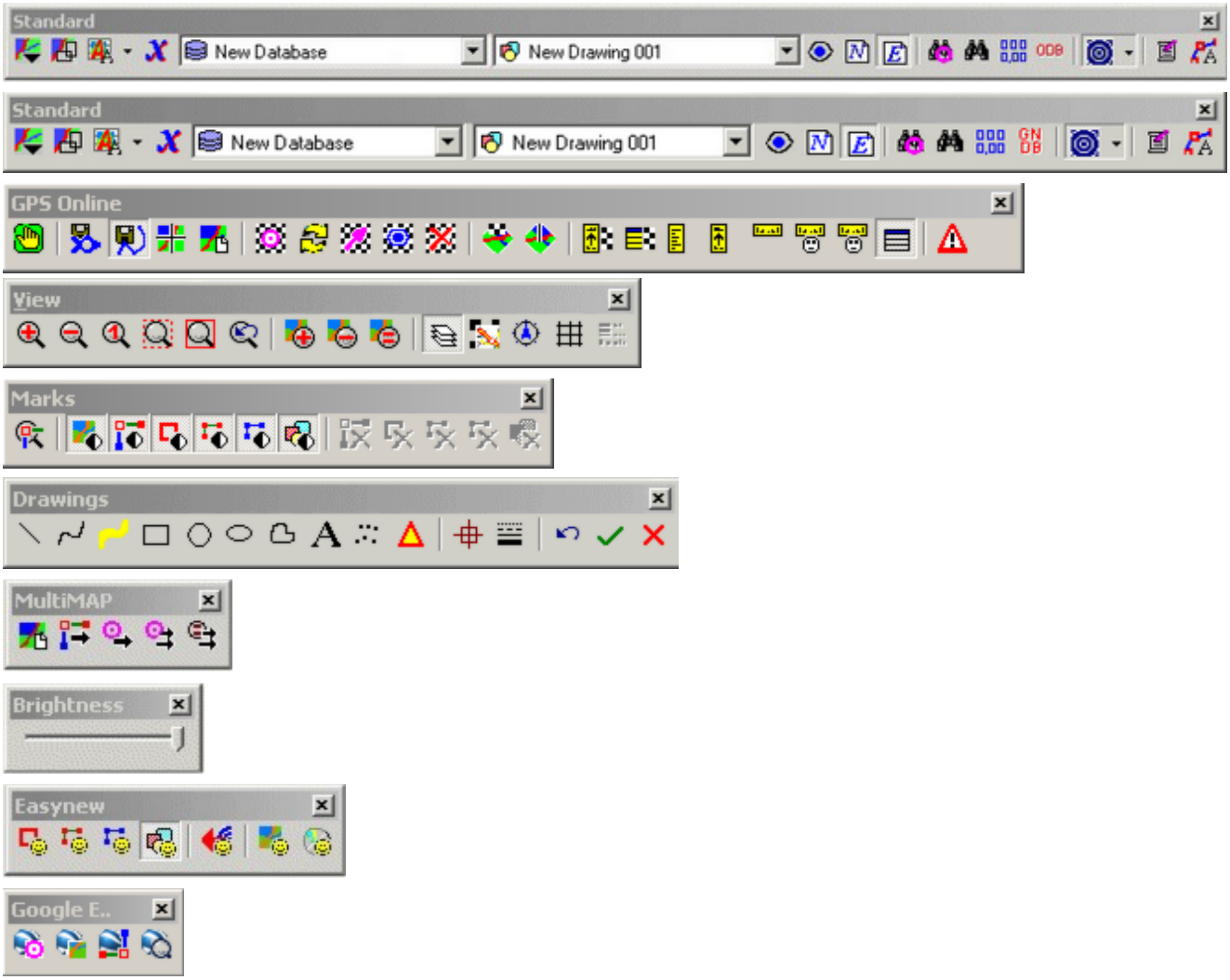
Content		Starts the help system with the contents. By left-clicking on the green underlined key words you will be directly forwarded to the relevant subject.
Topic	F1	Opens the Online help and jumps to the topic of the active window. Whenever you press F1 you will get context-specific help in *QV*.
Keycodes	Shift F2	Displays all available keyboard commands in a table. Appendix Keyboard Commands
What's new?		Displays the chapter *What's new in QV?*
Films		Here you'll find all tutorials. See chapter *Video clips in QV*.
Check TTQV.COM for a new Update		For this function you have to be online in the Internet. Using this command *QV* will automatically check on our homepage whether a new update of *QV* is available. If this is the case, you'll get a message including the download link.
Info	F12	Brings up an info box with details on memory allocation and the type of opened map.
About.../ Enter Licence		Shows the copyright information, your licence number and the release version of *QV*. Please provide this information with any support inquiry. Thanks. Here you can also enter your licence data and unlock code. See chapter Installation.

Toolbars

Various toolbars for specific tasks are available which can be docked to main windows or be placed wherever you like. All Toolbars can be switched on or off by a right-clicking on any toolbar and tick-marking or clearing a specific toolbar in the pop-up menu. The menu can also be accessed in the main menu under **View - Toolbars**.

The advantage of docking toolbars to a map window, the map is not masked by the toolbar and the map window can even be zoomed to maximum size. The same is true for many other dialog boxes, bars and diagrams like the street routing window or the XY diagram. Users who work with a 2 screen PC-configuration can even shift these windows to the other screen and can zoom their map window(s) always to maximum size. Just drag (Click and hold) the window with the blue title bar to the other screen and drop it there.

The following toolbars are available

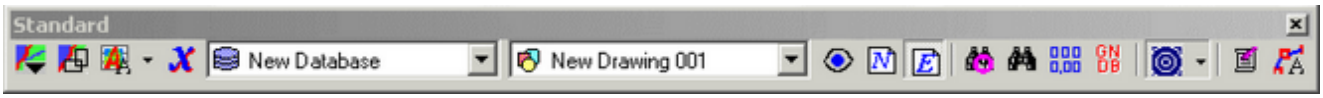


Click with the right mouse button on any toolbar and the following pop-up menu will open:

Opened toolbars are indicated by a tickmark. By a left-click with your mouse you can enable or disable the toolbar (switching function). Moreover, you can adapt the toolbars with the **Modify...** option. See also Modification of commands.

The Standard Toolbox

Many function of the **Standard** toolbox are also accessible through the pull-down menus and are described there. However, some functions can only be found in this toolbar. These are:



Open a map

A pop-up menu will open which lists all available maps. Which maps will be listed depends on your setting of the AutoMAP function.

Brings the map overview window to the front. A second click will switch back to the map detail window.

Quick access to a specific database.

Lists all waypoint, route, track and drawing tables within the selected database for a quick selection.

Displays the route or track which has been selected from the list in the map window.

Starts the AutoNEW function. According to your choice, a new route, track or drawing will be created.

For further details see AutoNEW - Creating new waypoints, routes and tracks.

Edits the selected route, track or drawing. You can insert, add or delete points.

Opens the units dialog box where you can specify the desired coordinate system, grid, map datum and choose the dimensions for speed, distance, altitude and area. You can also access this menu under **Settings - Units** from the main menu bar.

See chapter Settings.

Opens the *QV X-Plorer* and skips directly to the geographic database.

Quick and simple drag & drop handling

In QV 4 many operations can be executed by a simple drag & drop:

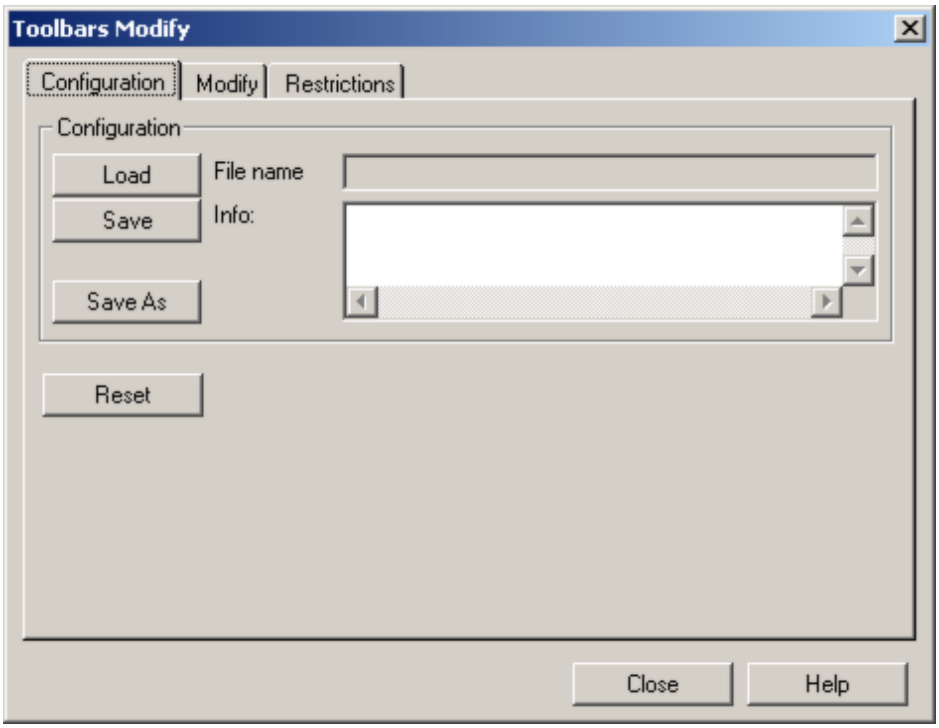
- Open maps: Simply drag & drop them from the *X-Plorer* to the free area of the main window.
- Show marking: Simply drag & drop a marking from the *X-Plorer* to the map window or the free area of the main window.
- Map overlay: Simply drag & drop a vector map to a map window with an opened raster map.
- Map import: Simply drag & drop a map file from the MS Windows Explorer to a map table of the *QV X-Plorer* and it will be automatically imported in QV. While uncalibrated maps have to be imported separately, calibrated maps can be imported in one batch.
- Links to ECWP map server can be dragged & dropped from the browser to a map table of the *QV X-Plorer*.
- Copy and move operations in the *X-Plorer* can also be executed by a simple drag & drop procedure.

Adapting menus and toolbars

In *QV* you can now adapt the menus and toolbars to your specific needs.

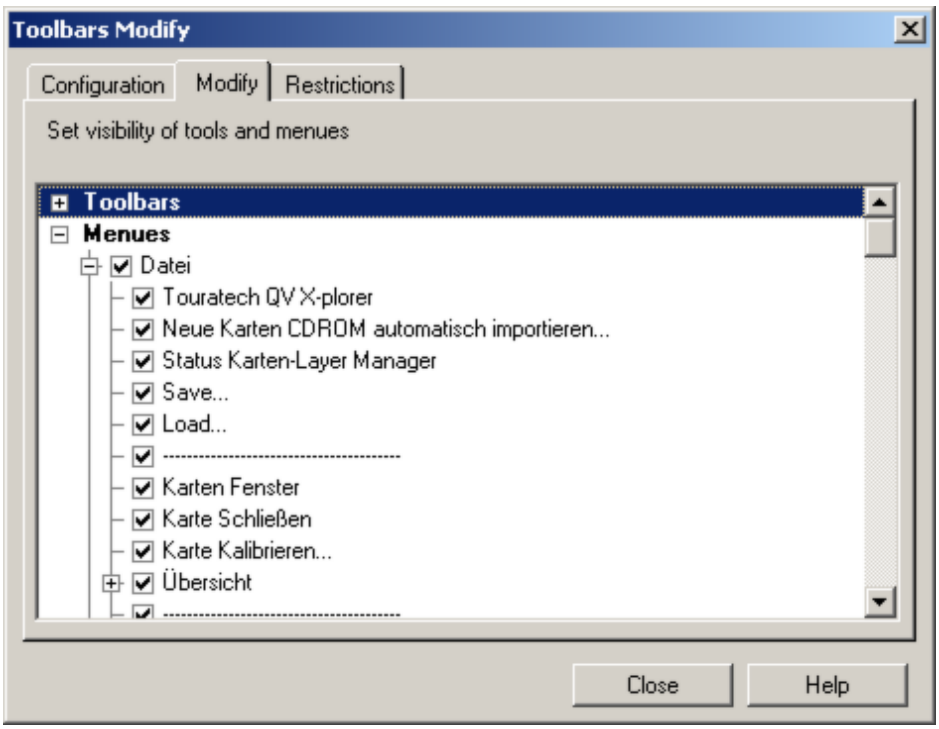
Choose **Modify** from the Pop-up menu of any toolbox or **View > Toolbars > Modify** from the main menu.

Three windows are available:

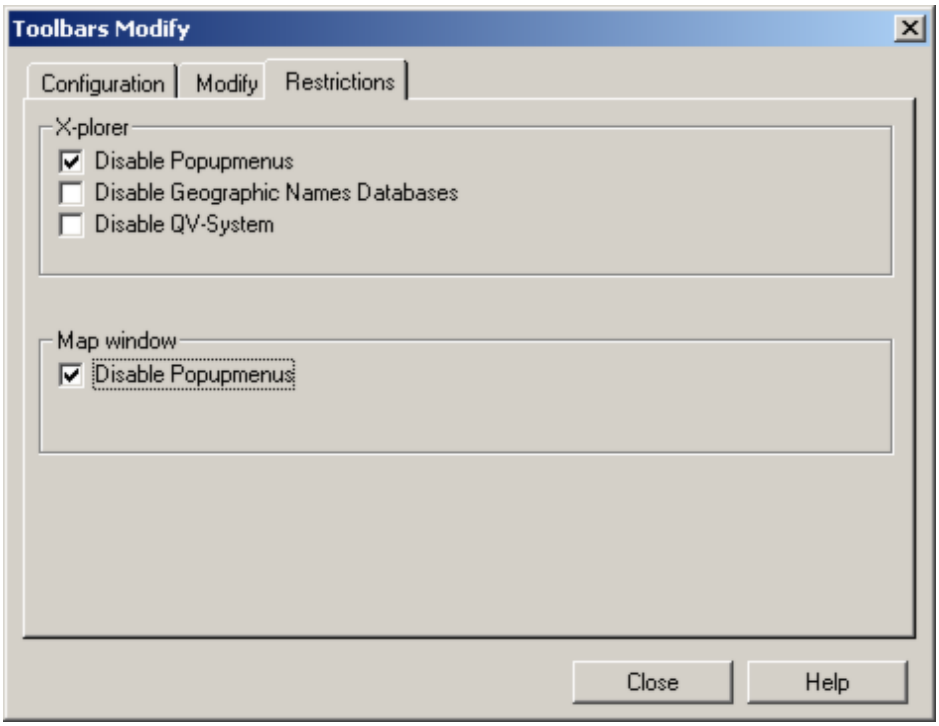


In this window you can save the modifications made in a file with the extension **.MNU* or load a specific toolbar configuration file.

If you work with *QV Professional* you can specify a password in order to restrict normal users from modifying the configuration.



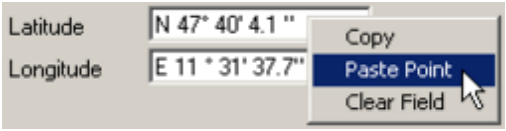
In the second window you can enable or disable certain functions to be included in this toolbar.



In the third window you can define additional restrictions.

Clipboard

QV has a system installed that will transfer coordinates using the clipboard. Each coordinate field has a pop-up menu that you can call up by right clicking in one of the two input fields of a coordinate box:



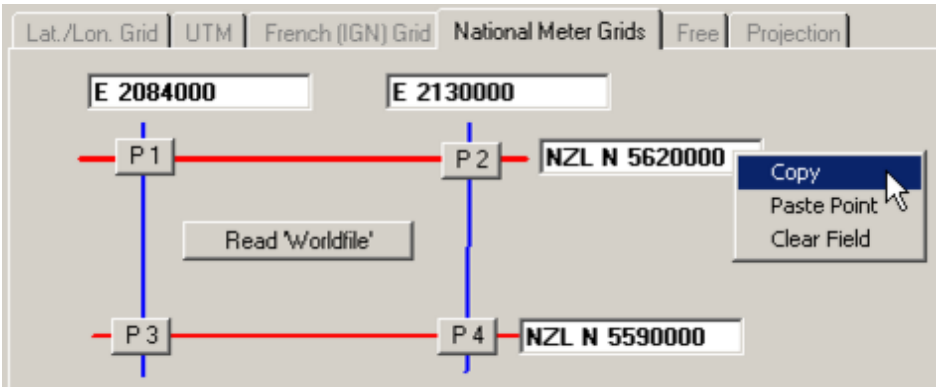
Copy Copies the coordinates to the QV clipboard. The coordinates are saved internally as decimal degrees in the universal WGS84 so the coordinate system currently displayed does not matter. The coordinates are also copied in the set format to the Windows clipboard. Thus, the point can be inserted as text in any Windows application:

N 51° 24' 27.8", E 7 ° 32' 5.3 "

Paste Point Pastes a previously copied coordinate into this coordinate field. In this way, the coordinate is converted to the currently set grid and datum.

Clear Field Sets the coordinates in this field to 0, 0.

For calibrating your maps, copying coordinates is very practical if you would like to use existing waypoints from the database as calibration points. Using this function you can **Copy** waypoint coordinates from the *X-Plorer* detail window and **Paste** them into the input field of the calibration window:



Using the clipboard you can also transfer coordinates from another WINDOWS application by simply copy-and-pasting them.

Data management with the QV X-Plorer

Data management with the QV X-Plorer

This chapter is about managing data with *QV*. Here, The design and functions of the *QV X-Plorer* will be described.

When working with *QV*, data will be produced and saved in a number of different ways. This data refers to maps with calibration information, waypoints, routes, tracks and drawing elements. Furthermore, geographic site data is managed in the integrated geographic names database and user defined map datum and grid systems have to be handled.

QV stores all data in databases. The *QV X-Plorer* is the central management tool for these data and is very similar to the *Windows Explorer* in design and function.

All data is displayed, edited, copied, moved and deleted in the QV *X-Plorer*. Waypoints, routes and tracks can be exchanged with GPS units, imported from other data sources and exported again.

Database structure

When you create a waypoint or a route in *QV*, calibrate a new map or download tracks from the GPS, this data must be stored so that they can be retrieved later on. It is also important that the data can be rearranged, for example in order to pool all data from the last holiday.

To handle these requirements, *QV* features a three stage structure:

- Table
- Database
- Directory

Each data record (a waypoint, a route, a map, etc.) is always stored in a table.

Each table is always saved in a database file.

Each data base file will always be stored in a specific directory of your hard disk drive.

This sound more complicated than it is:

Imagine each individual data record (a WP, route, etc.) as a piece of paper, which you must file in a folder.

The folder is the table!

You now put this folder on a shelf so that you can retrieve it later on.

The shelf is the database!

The shelf is in your office.

The room is the directory on the hard disk drive!

Of course you can file several pieces of paper (data records) in a folder (a table). You can put a number of folders (tables) on a shelf (database).

And in a room (directory) you can place a large number of shelves (databases).

If you want, you can distribute your shelves in various rooms. Then, you have several directories.

In the *QV X-Plorer*, the different directories, databases, tables and data records are labeled with symbols and can be displayed clearly with any name you want:

Symbol	Meaning
	Directory on the hard disk that contains databases.
	When this is crossed out, *QV* cannot access this directory at the moment, probably because the path has not been found.
	Frozen connections which can be reactivated in the database menu.

Database that contains tables.

Each *.QU4 file in a directory corresponds to a database listed in the *X-Plorer*.

The orange symbol indicates a write protected database. You can work normally with this database; however you cannot change, save or delete data.

Map table containing maps.

If the red A is visible, the table will be identified by the *AutoMAP function* when searching for maps, otherwise it won't.

For further details please refer to the AutoMAP chapter.

Individual map.

Waypoint table containing waypoints.

Individual waypoint.

Route table containing routes.

Individual route, corresponding to the table of route waypoints which are contained in the route.

Individual route waypoint.

Track table containing tracks.

Individual track corresponding to the table of trackpoints which are contained in the track.

Individual trackpoint.

Drawing table containing drawings.

An individual drawing will be indicated by a symbol corresponding to the type of drawing, e.g. line, square, rectangle, circle or ellipse.

Geographic names database table containing site coordinates; basically write protected except for the Topo CD import function.

Organizing your data

This is perhaps the most important chapter, because this one deals with your data, where and how it is saved and how you can sort and arrange them.

Basic structure

After the installation of TTQV, an empty database called "New database" is automatically created under the "QV DATA" folder with an empty Maps, Waypoints, Routes, Tracks and Drawing tables. The "QV DATA" folder is the default folder for databases and is located in the QU4 folder of the installation path, usually "C:\Program Files\TTQV4\QU4". The database "New database" is stored on the hard disk under the name "New database.QU4". In this database, you can immediately start calibrating new maps, create waypoints, routes. However, you might want to create different databases or tables for different types of rides, instead of putting everything in the same table.

Adapting the structure to your needs

By an intelligent organisation of directories, databases and tables you can structure your *X-Plorer* data tree clearly in order to access and retrieve your data quickly.

Directory

A directory is the highest *X-Plorer* level and represents a directory or file on the hard disk in which databases are stored. The command **New Connection** from the database menu adds the

selected directory to the *QV X-Plorer*.

Database

This refers to a file that contains tables. It has a user-defined name and always has the extension *.QU4.

The commands **New Database** will create new databases in the selected directory which contain an empty table for each table type.

Table

You can create as many map, waypoint, route, track and drawing tables within a database as you like. To perform this, select the corresponding command **New ... Table** either from the pop-up menu in the database or with the **New** button in the *QV X-Plorer*. A database does not have to contain each type of table. You can also create a database with only 3 map tables or a database with only 2 waypoint tables. Simply delete the tables you do not need.

Saving new data

When you want to create new waypoints, routes or tracks, download data from the GPS, calibrate a new map, read a new map CD/DVD or just import data, you will **first** have to decide where this data is going to be saved.

You do this by a simple click on the desired table in the *QV X-Plorer*.

Please note that the place where the new data is to be stored must be suitable for the type of new data. You cannot save waypoints in a map table but only in a waypoint table! In order to download tracks from the GPS, you must select a track table, etc. Or, in other words, if you have selected a track table, only tracks can be created.

Furthermore, only the commands that are suitable for the current selection are available for creating new data. When the **Download Waypoints from GPS** command is not available, either no waypoint table is selected or the database in which the selected table is located is write protected.

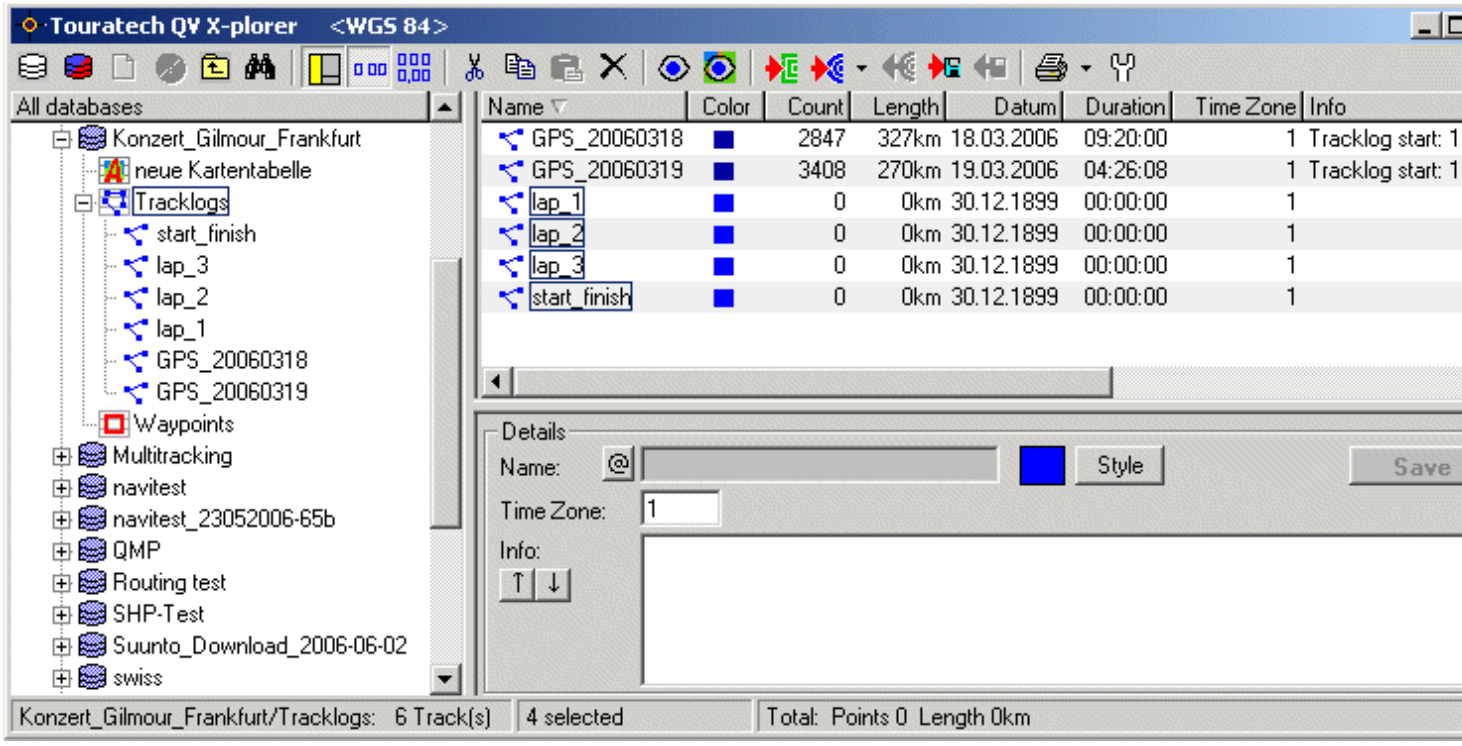
Backing up data

As already mentioned before, the *.QU4 database files contain **all** data. Therefore it is sufficient to back up your *.QU4 files from time to time. However note that according to your data organisation, these files may be distributed over various directories.

The **Compress** function in the *database menu* automatically creates back-up copies of the compressed databases with the same file names, but the suffix *.BAK.

X-Plorer Window

The X-Plorer Window



The *X-Plorer* window consists of 5 parts.

Symbol bar

Underneath the title line you will find the symbols to call up all functions you will need.

Tree window

The window to the left contains all directories with their databases and tables in a hierarchical tree structure. So your data are clearly structured and quickly accessible and also the type of data is indicated.

By clicking on the [+] or [-] icon next to a symbol, you can open or close the corresponding branch of the tree. When no [+] or [-] icon is visible, you have reached the end of a branch.

List window

The upper right window lists the content of the selected object in the tree window in a table form. The content of the list window will change according to the type of data.

Detail window

If you click on a line in the list window, further details on the selected object will be displayed in the detail window below.

In the detail window you can also edit the data record or modify attributes.

Status line

Indicates which directory and database object has been selected in the tree window, how many elements it contains and how many objects have been selected in the list window.

Functions of the symbol bar

Function

Database functions - A pop-up menu with the following options appears:

Refresh
Updates all data; useful especially in network applications when several users are accessing the same data.

Restore Connection
This function is only available when you have marked a directory in the tree window that is labeled with the icon. *QV* will try to re-establish a network or directory connection.

Terminate Connection
This function is only available when you have marked a directory in the tree window that is labeled with the icon. *QV* will close the path to the corresponding directory or terminate the network connection. The data will not be available to *QV* anymore, however they will not be deleted!

Connection freezed
This function is only available when you have marked a directory in the tree window that is labeled with the icon. *QV* will freeze the connection and the corresponding data will not be listed anymore. However the configured connection will remain and can be reactivated at any time! A freezed connection is indicated with an icon.

New Connection...
Opens another branch in the tree window and lists all databases (*.QU4 files) that are located in this directory. You can immediately work with the data and create new databases.

GNDB: Import Topo CD data
Imports site data from a Topo CD to the geographic names database.

GNDB: Change path...
Defines the path and directory for the geographic names database.

Import QV 1.x, QV 2.x, 3.x Database
Imports an existing map.mdb or QU2/QU3-file which has been created with an older version of *QV*. A new database will be created in the tree window which contains all maps, waypoints, routes and tracks. This is the simplest way of getting your stock of data into the new version.

Migration of databases from QV2.5, 3.x
Data transfer from older *QV* versions. For further information, please refer to the chapter Upgrade and import of existing data.

Show deleted objects
f you delete data in the *X-Plorer*, this will immediately be indicated by removing them from the tree window; however, they will not be deleted physically and can be retrieved. Using this function, you can display deleted data. The following two options are available:

Finalize deleting
This option is only available if a deleted object has been selected. If you execute this command, the deleting will be finalized and the related data cannot be restored later on!

Undo deleting
This option is only available if a deleted object has been selected. The deleting mark will be removed and the data can be edited normally.

Delete empty tables
This command will delete all empty tables.

Compress
This function will scan for databases and objects which have been marked as deleted and will remove them finally. A backup of the original database files will be stored under the same name but with a *.BAK extension.

New QV X-Plorer Window

Opens another *X-Plorer* window.

Database write protection ON/OFF

With this button, you can protect any database from being deleted or modified accidentally. You can recognize a write protected database by the orange icon, a database with read and write access is indicated by a blue icon.

Creates new databases, tables, waypoints, routes, tracks or maps. This function is depending from the currently selected element in the *X-Plorer* tree window. If a directory is currently selected, you can create a new database. If a route table is selected, you can create a new route, etc.

You will also find these functions in the in the *X-Plorer* pop-up menus.

If a *Directory* is selected, the pop-up menu will contain the following options:

New database Creates a new database with the default name *New database(1)* with a consecutive numbering if the name already exist. You can directly modify the proposed database name. The new database will contain an empty WP, route, track, map and drawing table.

Import QV 1.x, QV 2.x, 3.x database... Creates a new database containing all data from a map.mdb, a QU2 or a QU3 database. The simplest way of copying data from an older *QV* version to your new one.

If a *Database* is selected, the pop-up menu will contain the following options:

New Map table Creates a new map table in this database with the name *New Map table*. You can directly modify the table name. If the name already exists, a consecutive number will be added.

New Waypoint table Creates a new waypoint table in this database with the name *New Waypoint table*. You can directly modify the table name. If the name already exists, a consecutive number will be added.

New Route table Creates a new route table in this database with the name *New Route table*. You can directly modify the table name. If the name already exists, a consecutive number will be added.

New Track table Creates a new track table in this database with the name *New Track table*. You can directly modify the table name. If the name already exists, a consecutive number will be added.

New Drawing table Creates a new drawing table in this database with the name *New Drawing table*. You can directly modify the table name. If the name already exists, a consecutive number will be added.

New Vehicle table Creates a new vehicle table in this database with the name *New Vehicle table*. You can directly modify the table name. If the name already exists, a consecutive number will be added.

If a *Map table* is selected, the pop-up menu will contain the following functions:

Import new Map... Imports a map that has not yet been calibrated and adds it to the map table. You will have to select the map in the following file selection window. The map will be displayed and the calibration window will open automatically where you have to specify the calibration parameters. See *Calibrating Maps*.

New (empty) Map... Creates a new empty map. The data will be entered into this map table and the map will be calibrated automatically. See chapter *New empty map*.

Combine maps of same kind (New QTL)... Creates a new map by merging multiple bitmap tiles. Only available if suitable maps are selected. See chapter *QTL format*.

Create new vector map (QVM)... Creates a new map from multiple shape files. See chapter *QVM format*.

Import new Map (ECWP:\\Server)... Imports a new map from an internet link to an ECWP server. See chapter *ECW/ECWP maps*.

If a *Waypoint table* is selected, clicking on the icon will directly create a new waypoint in this waypoint table with the default name *WPxxxx* and the coordinates N 0°, E 0° where *xxxx* is a unique, consecutive number. You can directly modify the waypoint name if desired. The coordinates can then be specified in the currently set units in the detail window at the button.

If a *Route table* is selected, clicking on the icon will directly create a **New route** in this route table with the default name *New Route xxx* where *xxx* is a unique, consecutive number. You can directly modify the waypoint name if desired.

Another click on the icon will create a **New route waypoint** in this route table with the default name *xxxyyy* and the coordinates N 0°, E 0° where *xxx* is refers to the last 3 digits of the waypoint table's name and *yyy* is a consecutive number for the route

Import Map CD-ROM or Directory
Searches for maps calibrated ready to use and creates a new map table with all selected maps.

One level up
Selects the next directory or database element upwards. Necessary if the tree window is masked in order to reach the next directory level upwards.

Search by name
Opens the search window where you can locate specific sites in the database quickly.

Show/Hide Tree Window
Displays or masks the left tree window. When the tree window is masked, there is more space available for the list and detail windows.

Convert coordinates in list to current unit ON/OFF
Activates the conversion tool for coordinates from elements in the list window to the current unit. When disabled, all coordinates are displayed as degree decimals in WGS 84, when enabled, they are converted to the format and date currently set. Please note that this function will slows down the scrolling in the list window. The current date is displayed in the *X-Plorer* window title line.

Unit
Sets the current format and date for display and entering of coordinates. Identical with the button in the symbol bar of the main window.

Cut
Cuts and copies the selected elements to the clipboard. The data will not be deleted from the original place before they are inserted somewhere else.

Copy
Copies the selected elements to the clipboard without delete them from the original place.

Paste
Pastes the elements from the clipboard at the current cursor position. Please note that this will only work if the data format is suitable. For example, you can copy location data and paste them to a waypoint or route, but you can't paste a track into a drawing table.

You can also rearrange data by simple drag and drop operations.

Delete
Deletes all selected elements. Depending on the **Database** settings, the elements are either deleted from the list or marked as deleted and can be restored later on.

Show
When a map is selected in the list window, it will be opened in a map window. Otherwise, the selected elements are displayed on the map. Depending on the AutoMAP setting, a pop-up menu may open to offer a list of suitable maps for selection. The *X-Plorer* window will remains active.

Show+Map
Like the Show button but the *X-Plorer* window will be masked and the map window comes to the front.

Send to Garmin as a Map
Sends all selected elements to the map memory area of your Garmin GPS unit. See chapter Garmin IMG maps.

Send to GPS
Sends the selected waypoints, routes or tracks to the GPS. Also see chapter *Sending of data to the GPS device*.
If you click on the small triangle, a pop-up menu opens with further functions.
Split and send... Cuts the route in suitable segments which are then directly uploaded to the GPS unit.
Garmin Send Track ACTIVE LOG Uploads the selected tracks to the Active Log memory of your Garmin unit. Thus, longer tracks can be uploaded. See *Uploading of Tracks*.
Send WPs as Events Uploads the selected waypoints as events to your Lowrance/Eagle GPS device.
GPS Name Check Checks all selected waypoints and routes for name conflicts. See chapter *Sending of data to the GPS device* .

Download Routes / Tracks / Waypoints from GPS
Downloads the saved location data from your GPS unit to the current table. If you are in a waypoint table, all waypoints will be downloaded. This is the same with the download of tracks to a track table or with routes to a route table. Please note that you cannot retrieve data of different types (i.e. waypoints / tracks / routes) at the same time with this function.
To download different types of data in one batch, mark a directory first. *QV* will then create a new database and will then load the various types of location data into separate tables of this new database.
Also see chapter *Downloading of data from the GPS device*.

Export
Exports the selected data in the defined format.
For further detail please refer to the *Export* chapter.
Import
Opens a file selection box to choose a file for data import to the active database / table.
For further detail please refer to the *Import* chapter.
Print list
Will print the selected items as a list.
If you click on the small triangle to the right, a pop-up menu opens with further functions.
Print list to file Exports the list of selected items to a text file rather than the printer. This file can be further processed in other programs.
Copy list to Windows Clipboard Copies the selected items as a list directly to the clipboard. Thus, the list can be inserted directly into another programs.
See also *Printing data as a list*.
Special functions
For additional commands, please see chapter *Special Functions* below.

Additional functions in the pop-up menus

When you right-click on the name of an element either in the tree or the list window, a pop-up menu opens which features the most important functions from the symbol bar for a quick access. Furthermore, these menus also contain special functions which you will only find here:

Element	Function in the pop-up menu
Directory	**Remove Mark from Map** This command removes all data that is saved in the databases of this directory from the map window. The data is not deleted but just removed from the map display.
Database	**Remove Mark from Map** This command removes all data that is saved in all tables of this database from the map window. The data is not deleted but just removed from the map display. **AutoMAP Include all map tables** Marks all map tables in this database so that they will be included into the AutoMAP search function when scanning for neighbouring maps or maps with a larger or smaller scale. **AutoMAP EXclude all map tables** This command will exclude all map tables in this database from the AutoMAP search function. These maps will then be ignored when scanning for neigbouring maps or maps with a larger or smaller scale.
Map table	**AutoMAP** If this menu point is tick-marked, the corresponding map table will be included in the AutoMAP search function when scanning for available maps. This menu point is working as a software switch, so a second click will disable the function. The current AutoMap status for the map table is indicated by the tick in front of the menu point and by the corresponding symbol in the symbol bar.
Any table	**Remove Mark from Map** This command removes all data that is saved in this table from the map window. The data is not deleted but just removed from the map display.
Points, routes, tracks	Further command will be listed in the pop-up menu, see chapter *Special Functions* below.

Special functions

The Special functions icon opens a menu featuring several functions depending on what is selected in the *X-Plorer*. Many functions also allow for multiple selections.

You will also find these functions in the pop-up menu of the corresponding element.

For waypoints, routes and tracks

Routing: Add as station	Copies all points as stop-over points to the station list for street routing.
Navigation: Set as destination	Sets the selected points as new destinations. See chapter *GPS Online*.
GPS Name Check	Checks all selected waypoints and routes for name conflicts, e.g. scans for waypoints with identical names.

Additionally for waypoints

Set as HOME point	Defines this waypoint as new HOME point. The waypoint name will then be plotted on an orange background which indicates the HOME point status. For more information, please refer to the chapter *Calculate Route to HOME Point*.

Search Database near point... Starts the search function within a radius of the selected waypoint.

See *Search Functions*.

Additionally for routes and tracks

XY Diagram... Generates an XY diagram for this track or route.

See *XY Diagram*.

3D Diagram... Generates an 3D diagram for this track or route.

See *3D Diagram*.

Additional for tracks only

Search database in corridor... A dialog box opens where you can define a corridor width to both sides of the track. See chapter *Search functions*.

Track Processor Opens the *Track Processor* window with various functions such as an option to reduce the number of trackpoints, etc.

For further details see Track Processor.

Multi-Trackreplay A playback of multiple marked tracks can be simulated in the map display. See Multi-Trackreplay.

Digital Camera Pictures ---> With this command, digital photos can be assigned to trackpoints.

Automatic Assignment by time

See *Photos and tracks*.

Remove assignment

Calculate time difference GPS time - Photo time

Additionally for routes only

Split... Cuts a route or track automatically into several segments with a given point number.

This function is especially helpful for Uploading extended route to a GPS device as many GPS units have a limited capacity of points within a route.

Copy to Roadbook Creates a Roadbook from this route.

Displaying and sorting

Tree window

The tree window has a fixed order of display. Directories and databases are displayed in the order they were created, with the geographic names database directory and the QV system directory always at the end of the list.

Tables, routes and tracks within the databases are listed in an alphabetic order. Please note that the sorting after editing will not be updated before refreshing the tree window.

List window

In the list window the contents of map, waypoint, route, track and drawing tables are listed. The list can be sorted in ascending or descending order of each column. For this purpose, just left-click with the mouse into the column header and the list will be sorted according to this column in ascending or descending order. A small triangle will indicate the sorting order.

The list window for routes, i.e. the list of route waypoints, is sorted in a fixed order and cannot be rearranged. Otherwise, this would completely change the route!

Column width

The column width is calculated automatically by *QV*. Please note that only the first 50 entries will be considered when opening a table. If you scroll down or rename data, the columns may become

too narrow. To recalculate the optimum column width, double-click on the column title. You can also right-click on the top of the column and select **Column width optimal**. You can also left-click on the margin between two column headings and drag the column width to the desired size.

X-Plorer Units

Coordinates, distances and speeds can be displayed in many different units.

The unit icon opens the **Settings - Unit** window where you can specify the units in which you want the data to be calculated and displayed. The settings will only define the display of data in the *X-Plorer*, the printing of lists and the status line. They will not affect the entry of new data. Please note that with PCs with a comparably low performance the conversion of data may slow down your PC during scrolling between tables remarkably. In such cases you can disable the automatic data conversion with the software switch. If disabled, coordinates will be displayed in decimal degrees and in the WGS 84 map datum which will speed-up scrolling.

Further information is given in the *Settings* chapter.

Marking and selecting

Nearly all commands relate to "specific" data that you must select beforehand.

Selecting is performed by a left-click on the corresponding name in the tree or list window. The selected elements will then be shown in reverse color which indicates the marking status.

If you now click on another element thereafter, the reverse color marking of the previously selected element disappears and the new element is now marked and displayed in reverse color.

All commands refer to the selected elements displayed in reverse color in the active window.

Active window

Please note that either the tree or the list window is active, but never both together. You will recognize the active window by the reverse color of the marked element.

If you click on *Waypoints* in the waypoint table of the tree window, the name *Waypoints* will be plotted in reverse color and the list window will list all waypoints in this table. The tree window is now the *active window*. If you select **Delete**, the whole waypoint table would be deleted.

If you click on the first waypoint in the list window, this will be displayed in reverse color and the previously marked element in the tree window will change to standard text in a white frame. However, the waypoint table is still selected but is no longer active. The active window is now the list window. Selecting **Delete** would now only delete the marked waypoint.

Multiple selection

In the tree window, only one element can be marked at a time. However, several elements can be selected in the list window which are then displayed in reverse color. This is done using the standard Windows functions for marking, i.e. either with the mouse **+ Ctrl** or **Shift** or with the keyboard arrow keys **+ Ctrl** or **Shift** and the **Space** bar to reverse the selection. **Ctrl + A** marks all elements in the list.

Changing

If the parent database is not write protected (orange database symbol), all data can be changed.

Renaming

Right-click on the name that is to be changed, either in the tree or in the list window, and select **Rename** from the pop-up menu. Change the name and press **Enter** to confirm or **Esc**, if you want to cancel the editing. **Alt+F3** will also confirm the change.

Changing of other data in the detail window

Only the name can be changed in the tree or list window. To change other data, e.g. the description or the symbol of a waypoint, you have to use the detail window underneath the list window, which contains an input field or button for any field that can be changed.

Mark the required line in the list window and change the data in the detail window. As soon as you have changed something, the Save button becomes active and will be highlighted in red as a reminder that you have not yet saved the changes. The changes will not take effect until you confirm them by clicking the **Save** button or press **Enter** on the keyboard. To cancel the changes, simply select another element from the list window.

Changing of waypoint, track and route marks

With routes and tracks, you will find a colored square or the waypoint symbol next to the right of the **Name** field in the detail window. If you click on it with the mouse a window opens so that you can change all characteristics for marks such as color, symbol, font, etc. The same window will open when you click the **Style** button.

Changing several data sets at the same time

You can modify several data records at the same time. Highlight the required lines in the list window. In the detail window, the fields with different content will be indicated in gray while the ones with identical content will be displayed in white.

Now you can change the desired fields and click the **Save** button. Please note that although you can also enter data in the gray fields, *QV* will only save the modification that you have entered in the white fields in order to avoid accidentally editing of data.

Automatic consecutive numbering

A special function is the automatic consecutive numbering of lines, mostly used with waypoints. Highlight all waypoints which are to be re-numbered. The fields in the detail window are now (probably) all gray. Now, enter the new numbering in the **Name** field in the detail window as follows:

@PREFIX,START,STEP

PREFIX: any character string which will be used as a prefix.

START: the first highlighted data set will receive this start number.

STEP: increment for the consecutive numbering following the START number.

The AT sign (@) at the beginning is important and so are the commas (,) after prefix and start.

Leading zeros are automatically calculated.

The prefix can be skipped, but never the comma after the prefix:

@,START,STEP

Example: You have highlighted 3 waypoints and enter: @wp,10,2

If you now click the **Save** button, the three waypoints will be renamed to wp10, wp12 and wp14.

Please note that as a matter of principle, *QV* will number from the top to the bottom in the list window. Therefore, it depends on the sorting order which you apply which line will receive which number.

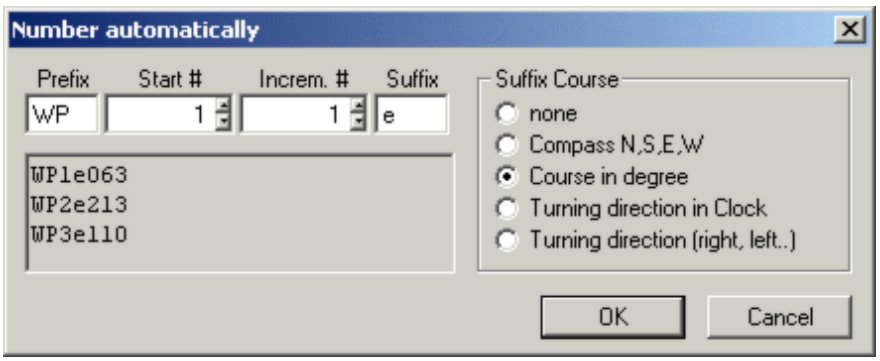
TIP: You can number waypoints extremely quickly, by entering @ and clicking the **Save** button.

All marked waypoints are then consecutively numbered starting with 000001.

Highlighted route waypoints are consecutively numbered with the current route WP prefix.

Automatic consecutive numbering, depending on direction

You can also use the Automatic consecutive numbering function which you can access by clicking the **@** icon left of the **Name** field:



Here you can enter the Prefix, Start, Increment and a Suffix comfortably in fields. If you have marked route waypoints, it is also possible to renumber the points depending on the course direction. In other words, the naming of a waypoint will indicate in which direction the next waypoint will be located. This function is very useful when working on a small-sized GPS display. For this purpose choose the option of your choice from the **Suffix Course** list to the right.

Copying maps

If you open a map table, you will find three special buttons in the detail window which you can use to move and copy maps on the hard disk.

Change Only changes the path information in the database, the file will not be copied or moved.

Example: Using the MS Windows Explorer, you have moved maps to another directory or copied them from CD/DVD to the hard disk. Obviously, *QV* will still search for the maps in the original path of the *QV* database. Therefore, these maps are unavailable which will be indicated in the *X-Plorer* list window by a reverse notification in a red bar. So, highlight all maps that are now located in another directory and select **Change**. In the following selection box, select the directory where the maps are now located and click the **Save** button. *QV* will now update the path information. If the maps are found in the selected path the map entries in the list window will immediately return to standard notification.

Move This function is intended to move a map to another directory directly from the *QV X-Plorer*. A selection box will open where you can select the directory to which the maps are to be moved. After clicking the **Save** button, *QV* will move the highlighted maps to the defined directory and update the path information in the database. Please note that this function will not work with maps highlighted in red because such maps are currently unavailable for QV due to invalid path information.

Copy This function works very similar to the Move function.

However, the marked maps will be copied to a new directory and the path information will be set to the new path.

Copying and moving

It is quite easy to organize data in the *QV X-Plorer*. You just need to create the desired databases and tables with the appropriate names and then reorganise your data by moving maps, routes, tracks and waypoints wherever you like. It is just as easy to transfer data, e.g. after preparing a journey on the PC to your notebook and, after the trip, back from the notebook to your PC. For this purpose *QV* will use the standard Window functions such as Cut, Copy, Paste or Drag and Drop.

Basically, almost anything can be copied or moved anywhere. However, you must follow these rules:

- The data that is to be copied or moved (the source data) must be highlighted first.

- Next select **Cut** or **Copy** either from the symbol bar or from the pop-up menu. You can also press **Ctrl+X** or **Ctrl+C** on the keyboard. (Please note that when selecting **Cut**, the source data will not be deleted until it is pasted).
- Then, mark the database object where you want the data to be inserted and select **Paste**, either from the symbol bar or from the pop-up menu. You can also press **Ctrl+V** on the keyboard.
- The place for pasting the source data must be one level up, so if you have highlighted and copied some waypoints, you must click on a waypoint table before pasting. If you have copied a table, the target must be a database.
- Source and target must not be the same. You cannot paste a waypoint into its own waypoint table. This would duplicate the waypoint. Route waypoints are an exception from this rule because the same waypoint may occur several times throughout a route.
- You cannot paste data to write protected databases or to the geographic names database, but you can copy data from these sources and paste them to other databases which are not write-protected.
- It does not matter whether you copy or paste in the list window, the tree window or in another *QV X-Plorer* window. All is possible.
- The paste function is automatically blocked if the source data cannot be pasted into the selected place, for example due to the fact that they are not suitable for the selected target.

Drag and Drop

It is even easier to move or copy data by a drag and drop operation with the mouse:

- Highlight the source data and release the left mouse button.
- Then, left-click on the selected object which is displayed in reverse color and hold the mouse button down.
- Drag the object with the mouse to move the source data to the desired place.
- Release the left mouse button on the directory, database or table to which the data should be moved.
- If you want to copy the source data, press **Ctrl** on the keyboard before dragging.

The mouse pointer will change its appearance while moving the data::

Moving several objects

Copying several objects (Ctrl button pressed)

Moving one object

Copying one object (Ctrl button pressed)

It is not possible to drop the selected objects here.

Deleting and restoring

To delete databases, tables and individual data records, highlight them either in the tree window or mark the relevant objects in the list window and select **Delete** from the pop-up window. You can also click on the corresponding icon in the symbol bar or press **Del** on the keyboard.

To delete a whole directory from the tree window highlight it and select **Remove Connection** from the database menu in the symbol bar. The directory with all its databases will then be removed from QV the *X-Plorer*. Please note that the corresponding data will not be deleted, so you can link and restore the directory later on using the **New Connection** command from the database menu in the symbol bar.

Restore deleted data

Inadvertently deleted objects can be recovered since *QV* works with delete mark and will only remove the tables and databases from the display.

By selecting **Show deleted objects** from the database menu in the symbol bar all deleted objects will be displayed again in the *QV X-Plorer* window. These objects are indicated by a "[DELETED]" label in front of the standard name and by a gray font.

You can now highlight such an object that you want to recover and select **Undo deleting**, either from the database menu or from the pop-up menu for the selected object.

Finalize deleting

Select **Show deleted objects** from the database menu in the symbol bar. All deleted objects will be displayed again in the *QV X-Plorer* window with a "[DELETED]" label in front of the standard name in gray.

Now, highlight the objects that you want to delete completely and select **Finalize deleting** from the database menu or from the pop-up menu for the selected object. Please note that this cannot be undone!

A faster method to remove all deleted objects at once is the command **Compress** from the database menu. It can be applied to individual databases or all databases in a directory. Just highlight either a database or a directory and then select **Compress**. There is one more security query and then all data marked as deleted will be removed and the memory used will be cleared. Before this happens, a back up copy of each highlighted database is made with the same file name but a *BAK file extension.

Displaying data on maps

One of the most important functions in *QV* is displaying the data on maps. As all data is saved with geographical coordinates and all maps are geo-referenced, *QV* can display all data on any maps. Data and coordinate or grid conversions are therefore done automatically. Thus, You can visualize a track on several different maps and decide which map is the best suited. A waypoint, track, route or drawing element on the map is referred to as a *mark*.

Displaying

Highlight the desired data in the *QV X-Plorer* and then click on the **Show on Map** icon in the symbol bar. Alternatively, you can select **Show** from the pop-up menu or simply press **Enter** on the keyboard. If a suitable map is already loaded, the data will be displayed on this map and the map will be scrolled so that the first point of the selected object will be located within the map window. If no map is loaded or the first point of the selected object is located outside the current map extent, the *AutoMAP* function will scan through the map tables and list all suitable maps in a pop-up menu. Please note that the maps that are listed will depend on the current *AutoMAP* settings.

It is also important to note that all data which you have plotted during a *QV* session remain loaded in the memory and *QV* always replot them every time you change to a new map. If you prefer that the marks are no longer plotted, you will have to remove them (see below).

Removing marks from the map

Select **Remove mark from map** from the mark's pop-up menu or from the object's pop-up menu in the *X-Plorer*. This will only remove the mark from the map, the object will not be deleted from the database.

Using the same command from the pop-up menu of the corresponding table or database, you can remove all marks referring to this table or database with a single command.

The AutoStart database

A special function is linked to the AutoStart database.

When you start *QV*, all parameters stored in this database will be loaded and displayed accordingly.

Physically, this is a standard *QV* database which was renamed to *AutoStart*. Just as with any

other databases, this database can handle any number of waypoint, route, track and drawing tables.

You can also copy a map table to this database which will also be automatically loaded during the starting process; however this map table should contain one map only. The map specified here will be dominant to the software switch titled **QV start: automatically open last map** under **Options - Settings - Map**.

To use this function follow these steps:

- Create a new database
- Rename this database to *AutoStart*
- Delete the tables that you do not need
- Paste the tables from other databases containing all objects which you want to be plotted after starting *QV*
- If you want to have a certain map displayed each time you start the program, create a map table and copy the desired map.

Note: If the *AutoStart* database contains several maps, *QV* will always display the first map. All other maps will be ignored. The "first" map is defined by the map which you copied to this map table first.

Printing of data in a list

The *X-Plorer* print function will print all highlighted data in a list form, with all data in the units currently set and in the current sorting order.

What is printed will depend on what you mark. The following lists can be printed:

- Routes with route waypoints (if you mark all waypoints within a route)
- Route lists without waypoints (if you select a route table)
- Individual route waypoints
- Waypoints
- Tracks with all trackpoints (if you mark all points within a track)
- Track lists without trackpoints (if you select a route table)
- Map lists

Just highlight the required data in the list window and click the icon.

The lists will be printed with the current printer settings. These can be changed at any time under **File - Printer settings** in the pull down menu of the main menu bar.

You can also export the lists as a text file or copy it directly into the Windows' clipboard. To do this, simply select the corresponding function from the **print list** pull-down menu.

Geographic database

QV comes with geographic databases that contain a selection of places world-wide with names, type of place (e.g. town, bridge, lake, etc.) and their coordinates.

The geographic names database (also called the GNDB) consists of four write protected database files including related tables and is fully integrated into the *QV X-Plorer*.

Database	**File**	**Tables**
Canada	canada2000.od2	Canada (high resolution)
Africa	africa.od2	Africa
America	america.od2	America except USA / Canada
Asia	asia.od2	Asia
Europe	europe.od2	Europe
Australia	australia.od2	Australia, Polynesia
USA	usa.od2	USA
NewZealand	newzealand.od2	New Zealand (high resolution)
Deutachland	deutschland.od2	Germany (high resolution)
Topo-Data	topo_data.od2	Topo_Data This database is not created until you import location data from a topo CD for the first time using the function **GNDB: Import Topo CD data** from the main database menu.

Remark: These data are *Public Domain* and descend from free public sources. They are pretty comprehensive and provided to our customers on an "*as is*" basis as an additional service.

We cannot guarantee for correctness, integrity or accuracy of these data and will refuse any responsibility!

The GNDB directory

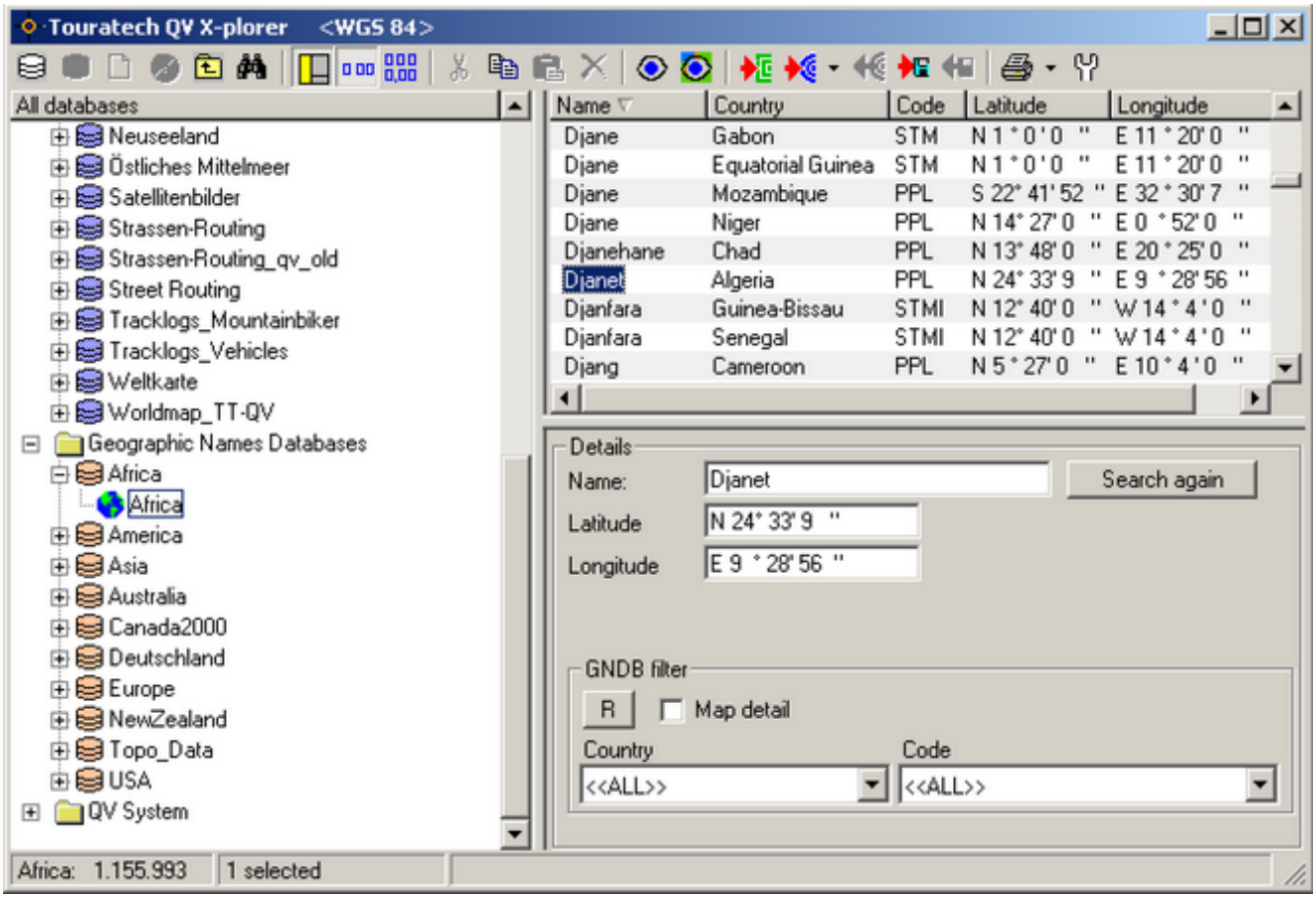
The geographic names database is contained on the QV program CD in the folder OD2 as a zipped file. Please copy this file to your hard disk (TTQV\OD2 directory) and extract it.

If the geographic names database symbol is displayed slashed in the *X-Plorer*, select the option **GNDB: Change path...** from the database menu and select the folder OD2.

Normally, this procedure will automatically be executed by the *QV* setup utility.

If you require additional hard disk space, the GNDB can be manually deleted from the disk at any time using the Windows Explorer.

Working with the GNDB



Except **Delete**, **Cut**, **New** and **Change** all functions of the *X-Plorer* are also available with the GNDB.

You can highlight entries and display them on the map, print them as a list or send them as waypoints to a connected GPS. You can also copy entries to a route or a waypoint table using drag and drop or copy and paste.

Filtering the GNDB

All places in a continent are stored within a table in the geographic names database. Using the filter function, you can reduce the number of entries in the list window.

Filter country	This selection box contains all country names of the selected table. If you select a country from the list, only places within this country are listed.
	Select <<ALL>> to select all data sets irrespective of the code.
Filter code	This selection box contains all codes of the selected table. If you select a code from the list, only places with this code are listed.
	Select <<ALL>> to select all data sets irrespective of the code.
	Appendix B lists all codes with their meanings.
Map window	If you tick-mark this box, only places within the current map window will be listed.

All filters are linked with a logical AND condition. If you have selected the *country* "Tanzania", the *code* "PPL" and tick-mark *Map window*, the search result will only contain towns (=PPL) in Tanzania which are also covered by the opened map. However, if you have currently a map of Germany opened, you will see an empty list!

Please note that the *Map window* filter is not updated automatically. Therefore, you must click the **R** button after scrolling in the opened map or when you have changed to another map.

GNDB Query

Regardless of the search function in the Search window, you can search a place quickly by entering the name in the *Name* field. With every character key, the list scrolls forward and the query will become more specific. Usually you do not need to enter the full name.

If the list contains several entries, you can jump to the next entry with a left-click on the **Search again** button, a right-click will return to the previous entry. The arrow keys on the keyboard have the same function.

Importing Location data from the Topo series CD's / DVD's

The CD's Top 10, Top 25, Top 50 and Top 200 from the National Geographic Survey Institute as well as Topo maps of the SwissMap series and the Austrian AMap also feature databases containing names of places and sometimes even streets (Top 10). These data can be integrated into the QV geographic names database.

Thus, a powerful search function with accurate and updated data sets is available unlike the standard database on Germany, Switzerland and Austria which originated from American sources and is sometimes inaccurate and incomplete.

The data must be integrated manually into the GNDB. Please follow this procedure:

- Insert your Topo CD into your CD drive and select the option **GNDB: Import Topo CD data** from the database menu.
- Select the folder *ORTE* or *LOCATIONS* in the following file dialog box. It depends on the CD, whether the folder is called *ORTE* or *LOCATIONS*.
- Next you can enter a name for this data record. This name will be used as a label later on in the *Country* selection box. The default is generated from the name of the CD and the name of the import file. As QV saves the data from all Topo CDs in one table, this is the only opportunity to access specifically the data on a particular CD.
- *QV* now imports all data automatically. Depending on the amount of data, this can take several minutes. At the end, a summary statistic is given, indicating how many data records have been processed, e.g. 1000 (1200) data records means that from a total of 1200 data sets only 1000 have been imported. The remaining 200 have been ignored because they were already included in the GNDB.
- Repeat these steps for all Topo CDs that you want to include.
- When using the new AMAP DVD from the Austrian Geographic Survey Institute, *QV* may prompt you to terminate the program and to restart one again. In this case, close and restart *QV* and import the Top50 GNDB once again. Now it should be imported correctly. Please note that the geographic database of AMAP v4 (Austrian FlyMap) is incompatible with QV and can currently not be imported.

Search Functions

Searching for files in the X-Plorer

To retrieve a specific entry quickly, you just have to enter the first letter of the name on the keyboard. This works both, in the tree and in the list window, but not in the geographic names database.

To quickly access an entry from the geographic names database, click into the *Name* field and type the first letter of the required name.

With every new character the search function will consecutively exclude non-matching entries until the queried entry is found.

Example: You are looking for the *HOME* waypoint in the table *Some Waypoints*

First, click on the table *Some Waypoints* In the tree window.

Now, click on the first waypoint of this table in the list window.

Then, type the letter *"h"* on the keyboard and the reverse color marking in the list window will skip to the first waypoint beginning with *H*.

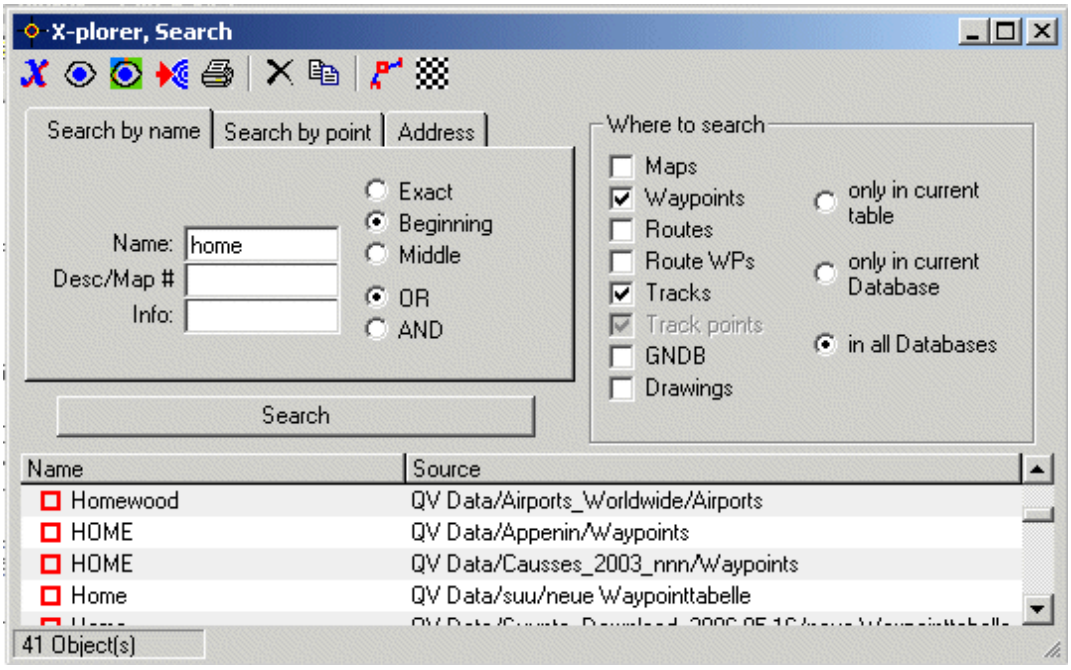
Now, type the letter *"o"* within a second, and the reverse color marking skips to the first waypoint beginning with *HO* and so on. Please note, that if you wait longer than a second before entering the second character, the search starts from the beginning and the marking skips to the first waypoint beginning with *O*.

Upper or lower case spelling is ignored. It does not matter whether you enter "h" or "H".

Extended search with the search window

The Search function allows for a quick and comfortable search in all available databases. You can either search by object name and by info text or search for objects that are within a specific radius of a fixed point.

A special window is available for this purpose:



Searching by name

Click on the *Search* icon in the *QV X-Plorer* to open the search window and the cursor will be placed in the *Name* field where you can immediately enter the term you are looking for.

Then, click on **Search** or press **Enter** and the search results will appear in the list.

Search fields:

Name: Enter the name or a part of it that you are looking for in this field.
Description/Map: You can also search for a description
Info: and/or check the Info field

Search options:

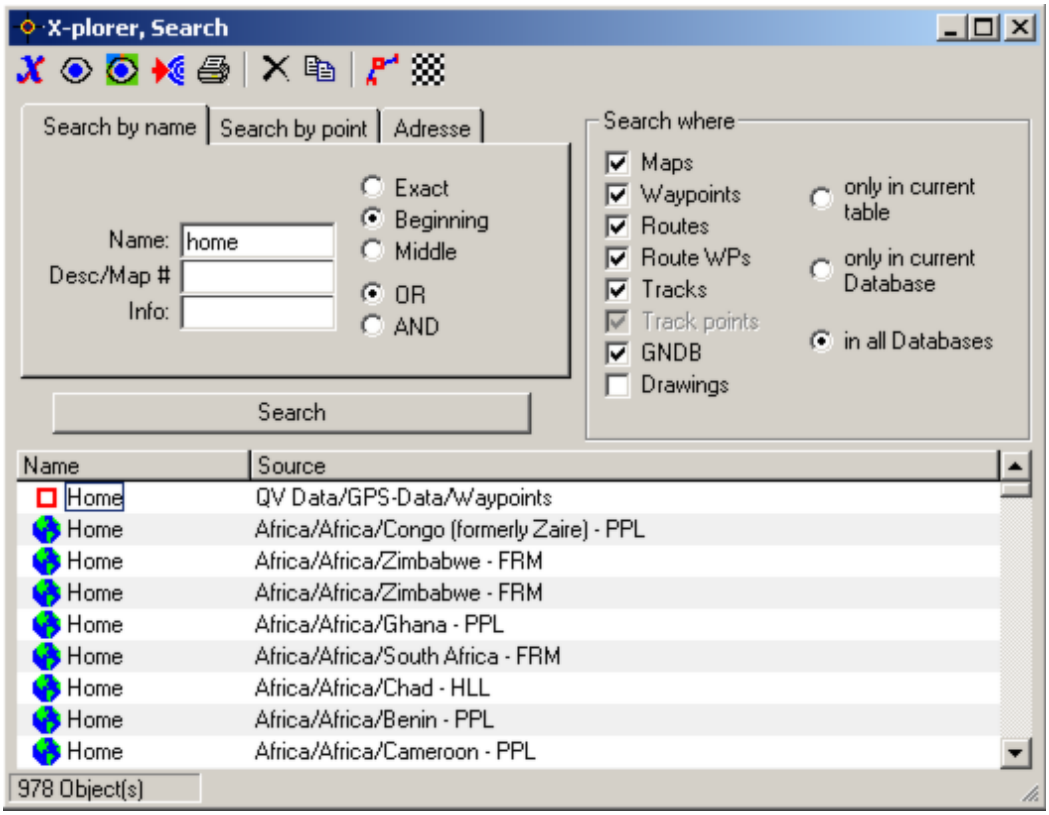
Exact: Only entries that correspond to the exact spelling will be identified.
Beginning: Will return search result where the character string at the beginning matches the field entry.
"Mount" will therefore return *Mount Helena* and *Mount Everest,* etc.
Middle: Returns entries where the character string is enclose somewhere in between.
Entering *"Hel"* will therefore return *Mount Helena* and *Helgoland*, etc.
This option requires powerful PC resources, especially with large databases.
OR Search fields will be logically linked with an OR-condition, so the search function will return
all data sets where at least one of the conditions applies.
AND In this case the search function will return only data sets where both conditions apply.

Where to search?

When you open the search window, the search function is set to the current *X-Plorer* table by default. However, you can extend the search by selecting the desired tables on the right hand part of the window.

The more conditions you define, the longer the search will take. You may receive an announcement "Query too complex". In this case, QV cannot execute the query because too many databases have to be scanned simultaneously. In this case, simplify the search function by excluding some tables or tick-mark **Only in current Database**.

Search within a radius



You can access this function from an open map in the map window.

Click on the map at the point around which you want to search for entries. Now, select **Search Database near Cursor...** from the pop-up menu (right mouse button).

The search window opens and you can enter the desired radius in the field **Range in km** and press **Enter** or click on the **Search** button.

QV will then return all entries that are within the specified search radius from the selected point.

Check **Map Detail** if you want to restrict the search function to points within the visible map extent of the current map window.

As with the *search by name* function, you can extend the search to waypoints, trackpoints and geographic names database entries.

By tick-marking **Sort result on distance to point** you can sort the listed results. The points which are next to the current cursor position will be listed first.

Search results

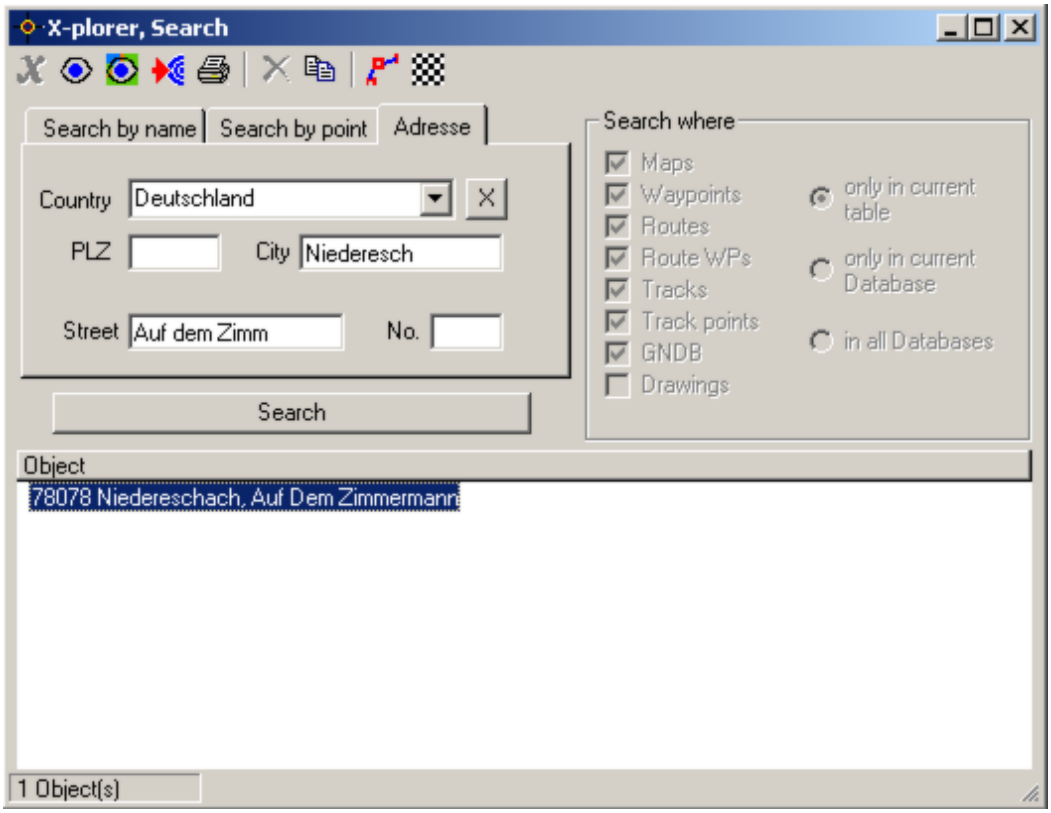
The entries found are displayed in the list with a symbol, name and source. Source is a text generated according to the pattern *directory/database/table*. Thus you see immediately in which table an entry is located.

The list cannot be sorted.

You can highlight any entries from the list with the mouse and select one of the following functions: **Show**, **Send to GPS**, **Print**, **Delete**, **Copy** or **Routing: Add as station** from the symbol bar. These functions are identical to the corresponding functions in the *X-Plorer* window. You can also select these functions from a pop-up menu which opens when you right-click on the highlighted hits.

Clicking the **X** button will open the *X-Plorer* window and skip to the selected entry.

Searching the street database



The *search window* has been extended by a search function in the vector database. Note that the installation of optional vector maps is essential to use this function.

This search is activated by clicking on the **Address** tab within the search window and the input form will change accordingly. Now enter the search terms into the fields. You do not have to define entries in all fields. However, the results will be more accurate if you enter detailed terms.

QV interprets the entries basically as the beginning text string of a word. Thus, in order to find *"Niedereschach"* it is sufficient to enter *Niederes*.

Tip: Many smaller towns are stored as part of a larger city. Therefore, if you are looking for a small town and have entered the name in the *Town* field and don't get a hit, delete the entry in the *Town* field and retry by entering the name in the *District* field.

Country Select the country you want to query from the list.

Meaning of appendices:

Roadnet: This country only contains a road network.

Multinet: This country contains all the street names, i.e. the corresponding map CD with detailed information has been installed for this country.

PLZ: The database for this country contains postal codes.

X Short cut for a quick clearing of all entries to start a new search.

ZIP If the selected country contains ZIP codes you can search these postal codes here. You do not have to enter the full ZIP code, but the more complete the entry, the more precise the results. Thus if you enter *"50"* you get all towns with ZIP code beginning with *50*.

City Enter at least the first letters of the desired town here.

District Enter at least the first letters of the desired district here.

Street Enter at least the first letters of the desired street here.

If you do not enter a street name here, all towns and districts which were identified in the database will be returned. If you want all streets in the towns listed additionally, tick-mark the check box to the right of this field.

No. You can specify a street no. in this field.

Street numbers are not registered everywhere. Thus, if no numbers are available for the requested street in the database you won't get a search result! In this case leave this field empty so that you will at least find the street.

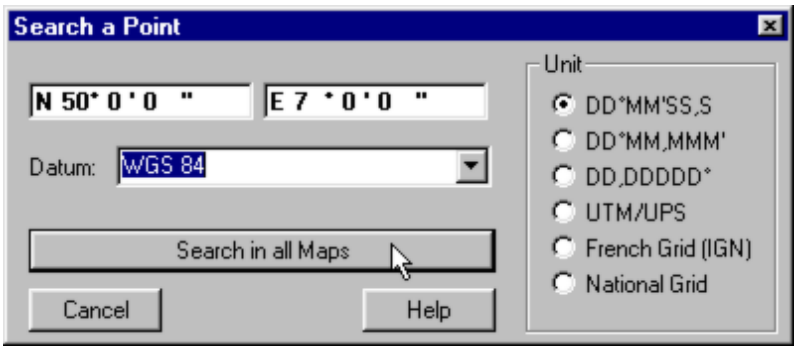
All search results are displayed in the list and can be processed with the known functions of the search window.

Copying an address as a stop-over point for street-routing

This option has already been mentioned elsewhere but it is repeated here due to its importance. If you have found the required address, right-click on the corresponding hit entry in the search window and select **Routing: Add as station** from the pop-up menu and the entry will be copied to the routing list.

Remark: Unlike searching in QV data, results from the vector map search can only be highlighted individually. It is not possible to make several selections at a time.

Searching by coordinates



This special search function is intended to find a point as quickly as possible when you only have the coordinates available. This function ignores the AutoMAP setting and always searches in all maps.

Click on in the main window or select **Search Point by Coordinates** from the Options menu or press **Ctrl P**.

The *Search a point* window opens.

- Switch to the adequate map datum and coordinate system of the required point.
- Enter the point in the coordinate field.
- Click on **Search in all Maps** or simply press **Enter** on the keyboard.

The window closes and you can select the map of your choice from the pop-up menu. Finally, *QV* place the map cursor at the exact location of the required point and will adjust the map extent accordingly.

QV System

The lowest branch in the *QV X-Plorer* tree window is called *QV System*. Here you have access to different databases in which system parameters are managed.

Currently, the databases **Datums**, **National Grids** and **DEM** are located there. Here, you will see all the defined types of map datum, grids and digital elevation models (DEM) with all parameters. You can add, modify or delete a map datum or a grid. Furthermore, DEMs can be imported, deleted and activated. Managing DEMs is described in detail in the chapter *Digital Elevation Models*.

Creating your own datum

Click on *Datums* in the tree window. Then, all the existing datums with all parameters will be displayed in the list window, sorted by name. Data displayed in black characters in the list window refer to provided *QV* standards which cannot be changed or deleted. Data displayed in blue refer to your own datums. These can be modified or deleted.

- Click on an existing map datum. All relevant parameters will be listed in the detail window.
- Change the parameters according to the new map datum definition.
- Confirm your settings by clicking **SAVE as NEW**

If you click on a blue datum, you can edit this datum and confirm the modifications with **Save changes** or remove it with **Delete**.

Creating your own grids

Click on *National Grids* in the tree window. All the existing grids with all parameters will be displayed in the list window, sorted by name. Grids displayed in black characters in the list window refer to provided *QV* standards which cannot be changed or deleted. Data displayed in blue refer to your own grids. These can be modified and deleted.

- Click on an existing grid. All relevant parameters will be listed in the detail window.
- Change the parameters according to the new grid definition.
- Confirm your settings by clicking **SAVE as NEW**

If you click on a blue grid, you can edit this datum and confirm the modifications with **Save changes** or remove it with **Delete**.

Some characteristics of grids:

- The prefix field is used to identify the grid in a coordinate box. The prefix always precedes the coordinate.
- Most grids are only valid for a specific area. In the fields Min_W, Max_E, Min_S and Max_N you can specify the area in which the grid will be valid and accurate. If you want to represent a coordinate outside this grid extent, *QV* will indicate this with a red *"0"*.
  If you fill these fields *"0"*, *QV* will assume that the grid is valid at any place around the globe and will not perform this plausibility check.

Transferring maps with user-defined datums and grids

User-defined grids and map datums are saved in the file *user.qbd*. Furthermore, the parameters for every map that uses a specific datum/grid are saved along with the calibration information.

That means that you can transfer the map with the calibration file to another PC with QV. When opening the map on another computer for the first time, the new datum/grid will automatically be added to the *user.qdb* file.

Even if you delete your own datum/grid by accident and later on open a map with a calibration file based on this definition, QV will automatically add the datum/grid to the *user.qdb* file and the map will be opened correctly.

Map window

Map window

The map window shows the current map. Here waypoints, routes, tracks and drawings are created. In the online mode you will see your actual position. Existing GPS data is plotted in user-defined colors, line styles and fonts and can be printed.

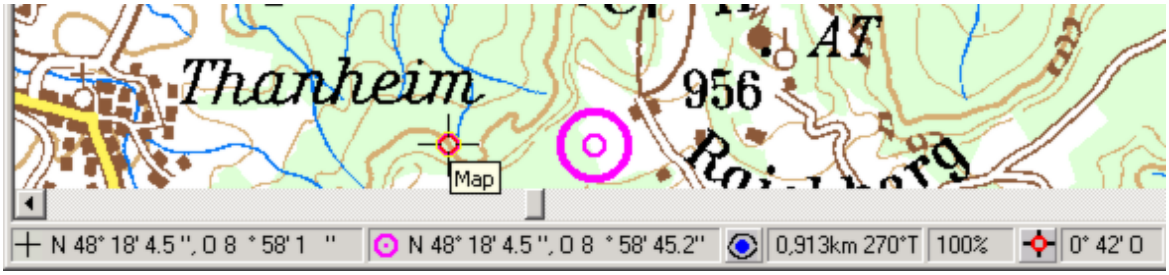
The basic principle is simple:

After a map has been calibrated, *QV* can calculate the geographic coordinates for any location of the mouse pointer. Each movement of the mouse is immediately converted into coordinates which are indicated in the first gray field of the status line.

And vice versa, each point whose geographic coordinates are known can be plotted in the correct place on the map. Simply enter the coordinates into the white field on the status line and click on the *Show* icon. The map will immediately be scrolled to this position (as long as the map covers this position!)

Left clicking on the map puts the so-called map cursor in the place of the mouse pointer which is indicated by a purple circle. The coordinates of the map cursor are shown in the second, white field in the status line. Clicking in this field will automatically open the *Search a Point* dialog box where you can enter coordinates in various units and map datums.

The third field to the right next to the **Show** button shows the corresponding distance and direction from the map cursor to the mouse pointer which will be continuously updated with every mouse movement.



This may not sound very exciting but it is the basis for all subsequent actions in the map window.

As waypoints, routes, tracks or drawings will be saved with their coordinates, they can be plotted on any suitable map. And vice versa, by simple mouse clicks new waypoints or tracks can be created.

The same is true for maps: As they are stored with their corresponding coordinates, *QV* can automatically search suitable maps for any point, track or route.

Opening maps

There are many ways to open maps.

The following methods allow for a direct access to all available maps:

- In the *QV X-Plorer* you can select a map from a map table and open it with a double click or by clicking the icon.
- Simply drag the desired map from the *X-Plorer* into the *QV* main window.

All following methods are influenced by the current setting of the *AutoMAP* function:

- Selecting by map name:
  With this method you open a specific map directly.
- Selection using map names: with this method, you directly open the map of your choice.
- By clicking the icon from the main window and selecting a map from the pop-up menu.

- Double-clicking on an indicated map extent in the map overview window.
- Right-clicking on an indicated map extent in the map overview window and selecting a map from the pop-up menu.
- Selecting using a point: If you want to view a specific point (which could be a waypoint, a route or a trackpoint) open the point pop-up menu and select from the sample of suitable maps which will be listed.
- Selecting waypoints, routes, tracks or drawings in the *QV X-Plorer* and clicking the icon.
- Right clicking on an open map and selecting a neighbouring map or a map with a differnt scale from the pop-up menu.
- Entering a coordinate either in the **Search a point** dialog box or in the corresponding field of the status line.

(It is likely that we missed some additional options...)

In all these cases you can simultaneously push the **Ctrl** button and the selected map will be opened in a new map window. By default the map will be opened in the current map window and replace the former map.

Map extent and section

The map plot can be shifted within the map window in various ways:

- Horizontally and vertically with the scroll bars to the lower and right edge of the map window.
- Using the arrow keys on the keyboard. With this method a neighbouring map will automatically be searched and opened when the map extend of the current map is reached.
- By dragging the map during a click-and-hold operation with left mouse button.

The map display can also be zoomed in various ways:

- By selecting one of the zoom symbols in the **symbol bar** of the main window.
- By selecting one of the zoom commands from the **View** menu in the main menu bar.
- By pressing **+** or **-** on the keyboard to zoom in or out, key **1** for 100% zoom and key **4** to display the whole map.
- By moving the mouse up or down keeping the right mouse button held down.
- By selecting a zoom stage from the pop-up menu in the status line.
- With the scroll wheel of your mouse.

When zooming, either the position of the map cursor is centered in the map window or the currently viewed map extent is kept unchanged and the zoom function is centered to the middle of the map window. You can modify this setting under **Settings - Map - Zoom center of point circle** (software switch).

Mouse pointer

You can choose from various mouse pointers, either by clicking with the mouse on the crosshairs symbol in the status line or under **Settings - Map**:

Normal, small mouse pointer

Crosshairs. Vertical and horizontal lines at right angles and parallel to the edge of the window.

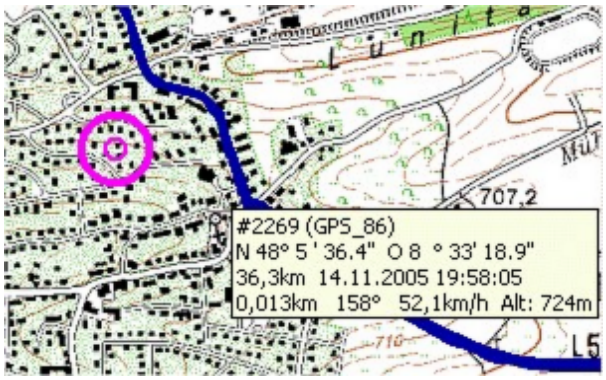
Turned crosshairs (Crosshair North) The vertical line shows the north-south direction, the horizontal line the east-west direction at the mouse position relative to the geographical North Pole.

Turned crosshairs, magnetic (Compass North). The vertical line shows the north-south direction and points to the magnetic North Pole. The horizontal line is perpendicular to it.

Curved crosshairs (Grid). The horizontal line always runs along the line of latitude, the vertical line along the line of longitude at the mouse position.

Magnifier. The map is shown enlarged around the mouse position. Markings don't appear in the magnifying glass, only on the map.

Tooltips



Many map objects contain specific infos which open as tooltip box if the mouse pointer stops for one second or so.
In the example on the left this is the corresponding address from the Navteq database (this function must be activated under **Settings - Street Routing - Tooltips**).
In the example on the right trackpoint details are listed (this function must be activated under **Settings - Map - Quickinfos**)

While the box is shown, you can copy the content to the clipboard by pressing **Ctrl C**:

#12536 (GPS_86)
N 48° 5 ' 41.2" O 8 ° 33' 13.6"
784km 16.11.2005 21:49:40

AutoMAP

The AutoMAP function will help you to find the optimal map to a specific position. The function will work in the background and will be active in any case when a specific point is to be plotted in a map such as:

- **Show in Map** function for waypoints, routes, tracks or drawings.
- Search for a specific point according to its coordinates.
- Search for neighbouring and maps of a bigger or smaller scale.
- Visualisation of your current position in the GPS online mode.

The functioning of AutoMap is quite simple:

- You would like to view a certain position and click on .
- According to the AutoMap setting, *QV* will now search in all or in a sample of maps if they contain this specific point.
- All suitable maps will be listed in a pop-up window with their names and you can choose the desired map which will then be opened. If only one map has been found, this will automatically be opened.

The switch for the AutoMAP setting can be found in the symbol bar of the main window or as menu point **AutoMAP** under **Options** of the main menu.

Four different settings are possible. The current setting is indicated by the symbol in the main menu which will change accordingly:

Disabled. *QV* will not search for maps and no automatic skipping between maps will take place.

Actual map table only.

AutoMAP will only search in the map table where the actual map is located.

If no map is opened, QV will search in all marked tables. In this case it is identical to

the setting .

Actual database only.

AutoMAP will search in all map tables of the database where the actual map is located. If no map is opened, QV will search in all marked tables. In this case it is identical to

the setting .

Marked tables only

AutoMAP will search in all tables which have been marked as AutoMAP tables in the *QV X-Plorer*.

You can mark any map table for AutoMAP use in the *X-Plorer* by a right-click with the mouse and by choosing **AutoMAP** from the pop-up menu. The table symbol will indicate

the current status: disabled, enabled.

In order to select or exclude all map tables of a specific data base you can choose **AutoMAP: INclude all map tables** or **AutoMAP: EXclude all map tables** from the pop-up window which will appear after a right-click with the mouse on the database name.

All tables

Using this setting *QV* will always search in all available map tables of your system.

Please note that the map overview window and also the option **Open a map** in the main window will only list the maps according to the current AutoMAP setting. If the AutoMAP function has been disabled, you will not see any map in the map overview window nor will any map be listed under **Open a map**!

The only exception from this rule is the function **Search point by coordinates** . This function will always search in all available maps irrespective of the current AutoMAP setting.

Of course you will also find all maps in the list window of the *QV X-Plorer*.

Maps on CD/DVD and maps which are unavailable

If you want to open maps from CD/DVD, it may happen that the CD/DVD is currently not available in your drive. In this case you will be requested to insert the disk.

However, a software switch is available under **Options - Settings - Map** where you can automatically exclude unavailable maps. This switch is labeled **AutoMAP: Use only maps which are present on HD/CD**. If this switch is enabled, the AutoMAP function will first check if the map is available on your system. If not, it will be ignored.

In the listing window of the *QV X-Plorer* these maps are indicated in red. This means that either the file or the directory could not be found. Please check and assign a new path to the corresponding map in the lower part of the *QV X-Plorer* by clicking on the **Change** button. You can then assign the path to where this map is currently located in your system.

Map pop-up menu

The following functions are available in the Map pop-up menu which can be accessed by a right mouse-click on a map in the map window.

QV X-Plorer	Opens the *QV X-Plorer* and refers to the opened map in the list window.
Activate	As above, but the map window will stay in front.
AutoNEW: copy this existing point	Copies an existing point for creating a new point with the AutoNew function.
Routing: Add as station	Copies the actual cursor position (purple circle) to the station list of the street routing function as new stop-over point. See *Street Routing*.
Navigation: Set as destination	Will define the actual cursor position (purple circle) as new destination. See *GPS Online*.
Copy coordinate	Will define the actual cursor position (purple circle) to the Windows clipboard. See *Clipboard*.
Convert coordinate	Will open an info box and return the coordinates of the actual cursor position (purple circle) in various coordinate systems. Furthermore, the altitude according to the DEM and the magnetic declination is given and also the times for sunrise / sunset and moonrise / moonset. Moon visibility is specified in percent, a negative sign indicates decreasing moon visibility.
Detail/neighbouring Maps...	A pop-up menu will open which lists all available maps for the actual cursor position (purple circle). Neighbouring maps will be searched from the actual cursor position (purple circle) in all directions.
Show point in another map window...	Plots the cursor position (purple circle) in another map window and will optionally open an additional map window.
Show HOME point	Will indicate the *HOME point* in the active map window.
Calculate Route to HOME Point	Will define the *HOME point* as destination for street routing and immediately calculate the route according to your predefined preferences.. See chapter *Calculate Route to the HOME point*.
Calculate Route from HOME Point	Will immediately calculate a route from the *HOME point* to your actual cursor position (purple circle).
Save Point as Waypoint	Will save your actual cursor position (purple cirde) as waypoint. Only available if a waypoint table has been selected. Identical to the **F6** key.
Search Database near cursor...	Will open a search window in order to scan the database for objects within a user-defined circle around actual cursor position (purple circle). See chapter *Extended search with the search window.*
3D Diagram...	If you have installed a digital elevation model (DEM), QV can generate a 3D view of the landscape. For details refer to the chapter *3D Diagram*.

Overlays

In this pop-up menu, all available maps are listed which support vector overlays on your current map view at the actual cursor position (purple circle).

See chapter Overlays.

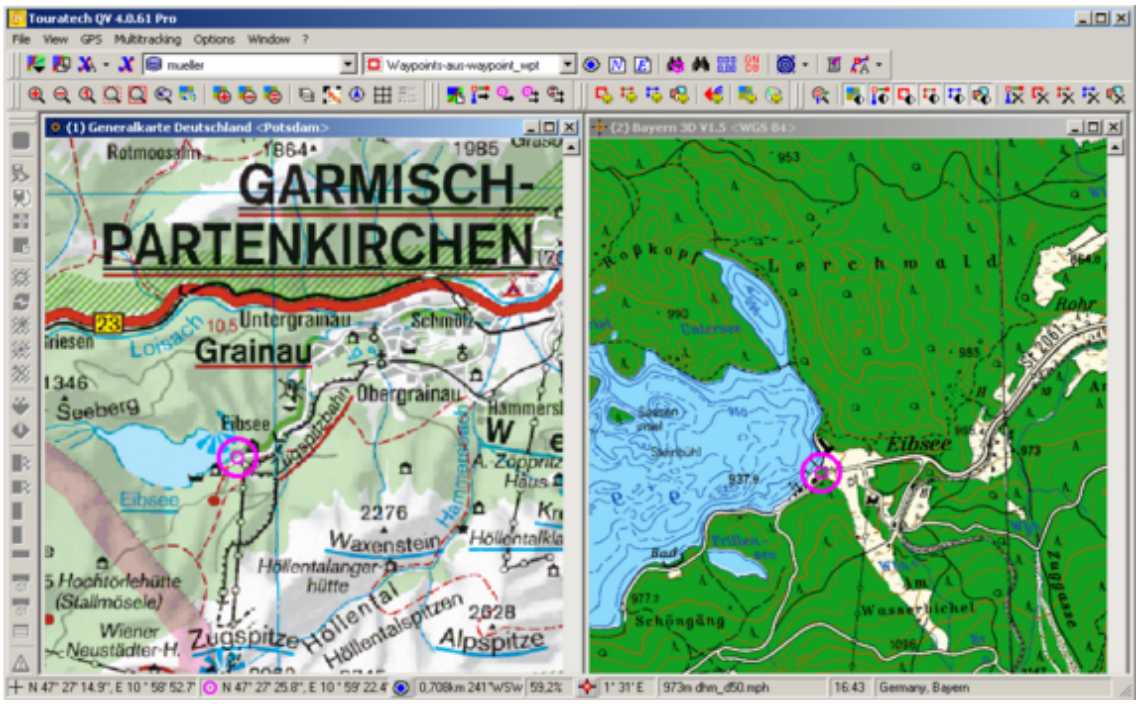
List of all available maps

At the bottom of this pop-up menu, all available maps are listed which cover the actual cursor position (purple circle).

A (+) indicates a bigger scale, i.e. more details.
A (-) indicates a smaller scale, i.e. more less details.
A (V) codes a vector map with variable scale.

MultiMAP - Multiple map windows

In QV you can open several map windows at a time:



All map windows are completely independent from another. Each window can show different maps or the same map can be viewed in all windows in different extents, scales and details.

When creating or editing waypoints, routes, tracks or drawings, it is helpful to work with several map windows, e.g. one for an overview map and one with a large scale showing all the details.

Changes made in one map window automatically be synchronized and displayed in the other.

In the GPS online mode you can follow your position simultaneously in the different map windows respectively zoom stages, e.g. city map or overview map.

Working with several map windows

If you plot all marks by clicking the icon, they will be displayed in all opened windows, unless you have disabled the option **Marks: Show in all map windows**, see **Options - Settings - Map** . In this case, the marks will exclusively be plotted in the active map window.

If you are editing marks, e.g. delete or insert points, then all changes will automatically be updated in all map windows.

In contrast, all *QV* commands related to a specific map always refer to the active map window only, e.g. printing, displaying of marks or the status line at the lower border of main window.

The active map window is indicated with a blue title line. In the example given above, this is the second map window (2) showing a topographical map of Germany with a 1:25.000 scale. This is the window to which all commands are focussed.

If you want to change the focus to another map, just click on the other window, or change the map window by pressing the **Ctrl-Tab** keys or using the *Map Layer Manager*.

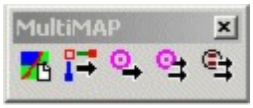
If you want to switch to another map in a given window, right-click on the map and select another map from the list in the pop-up menu which will open.

If you want a certain point to be plotted in another map window, right-click on the map at the desired location and select **Show point in another map window...** from the opening pop-up menu. Choose from the following list a window which is already open or select **New map window** if you want the point to be plotted in a new map.

Remark: QV Standard supports a maximum of 3 map windows which can be opened simultaneously.
QV Light is limited to 1 map window while *QV Power User* and *QV Professional* support 5, respectively 10 map windows at a time.

The MultiMap toolbar

In this toolbar all important commands are summarized for a convenient work with multiple map windows:



Opens another map and shows the currently selected point in the new map. All marks are automatically plotted in the new map window. You can also execute this command from the map pop-up menu selecting **Show point in another map window... - New map window**.

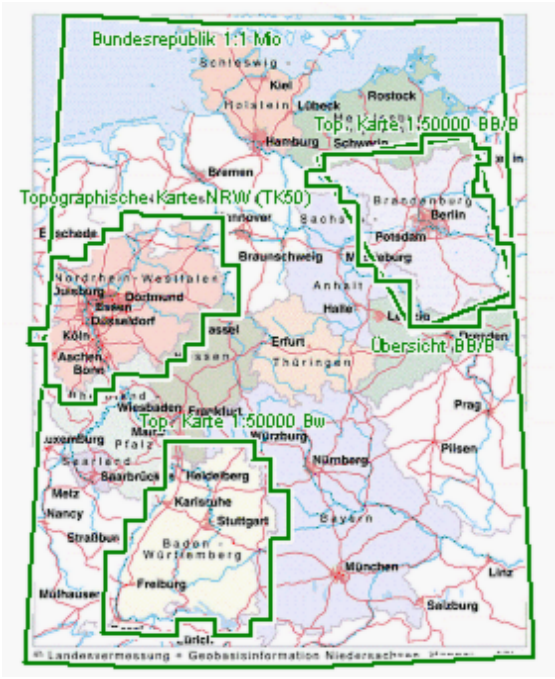
Copies all marks from the current map window into the other map window.

The actual map cursor position will be copied to the other map window and the map will be scrolled in order to place this coordinate within the window.

The actual map cursor position will be copied to all other map windows and the maps will be scrolled in order to place this coordinate within the window.

The map scale will be applied to all other maps and the map extent will be adjusted accordingly (if possible).

Active map extent



The *Active Map Extent* is the map extent which in fact will be printed.

Excluded from the map extent are the map legend, the white map borderlines and other labels which are positioned outside of the defined map extent.

Of course *QV* will not automatically know the map extent because by default the entire bitmap counts as a map. Consequently, it is possible to create waypoints on the map legend or *QV* will plot your track in the online mode in areas which do not contain meaningful information.

For such cases it is possible to define an area which is called the *Active Map Extent*.

Furthermore, *QV* can show the active map extents for several maps in the current map window (see graph). Thus, you can see at a glance where the next map starts.

The active map extent is determined as follows:

First of all, the map has to be calibrated.

Then select the function **Set active map extent to calibration...** from the pop-up menu of the *X-Plorer*.

Now the active map extent is set to the calibration points. With many maps where the calibration points are in the edges of the printed map area this option works well and the active map extent is defined.

However, modifications are necessary in some cases. For this purpose, open the map and enable **Active map extent** in the *Layer Manager*. Now the active map extent is marked by a light-green line and red dots at the map borders. You can now right-click on these points and lines and move the points using the commands of the pop-up menu. All changes will be saved automatically.

X-Plorer	Brings the *X-Plorer* to the front and highlights the map in the list.
Skip to the next point **Skip to the previous point** **Skip to the first point** **Skip to the last point**	Moves the selection to this very point.
Move	Moves the point to a new position.
Delete point	Deletes the point
Inserts point in the actual line (dynamic)	Inserts a new point which can be immediately moved to a new position. You can set 31 points at the most..

Outside the active map extent, a red map cursor will appear.

In order to see the active map extents of other maps in the current map window, you have to enable this function first under **Options-Settings-Map** with the option **Show all active map extents in maps**. However, depending on the number of maps, it might take a little longer to open a map. In the *Layer Manager* the layer **Other Maps - AutoMap** will now be listed containing the active map extents of other maps. If this layer is switched on, the active map extents of other maps are indicated as green polylines. You can click on this line and open the map directly from the pop-up menu.

AutoMAP and active map extent

Both functions are working closely together. Each time when *QV* is searching for a specific point, first of all available maps according to the current AutoMap setting are scanned. Then, if defined, the active map extent is considered as a second criteria to decide if the searched point is covered by a specific map. That means, *QV* automatically checks whether the requested point is within the active map extent and whether the map is listed in the AutoMap setting. Otherwise the corresponding map will not further be considered.

Note: For this purpose, the active map extents do not need to be shown in map.

For performance reasons, you should by default disable the option **Show all active map extents in maps** under **Options - Settings - Map**.

Layer Manager

Layer Manager

In order to keep the overview and facilitate orientation with several map windows and different marks the layer manager has been created.

The layer manager can be enabled and disabled with the icon (switch function).

You can place the window freely on your screen or dock it to the *QV* main window.

Similar to the *X-Plorer* tree window, all maps, layers and markings will be listed. By clicking on the + or - symbol you can include or exclude directory listings and tick-mark the objects to be plotted in the map window (or prevent them form being plotted).

In the toolbox at the top of the layer manager window three buttons are available: **X-Plorer, Show in map** and **Delete mark.**

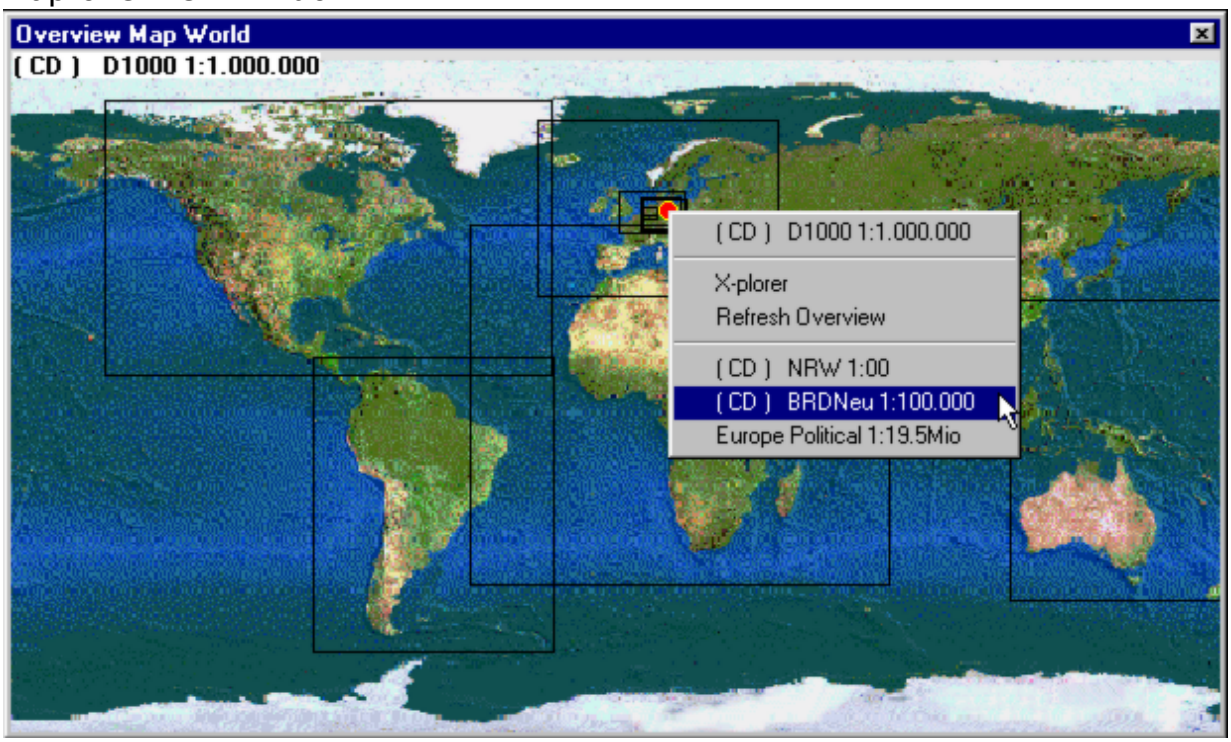
Using these buttons you can either refer to the *X-Plorer* listing of the marked element, view it in the map or delete the marking from the map.

If you have a vector map opened, you can easily include or exclude certain layers (map topics like road category, river, forest, etc.) from the map view. Furthermore, by right-clicking on a layer entry, a pop-up menu will open where you can enter a threshold for visibility ranking from -5 to +5. This threshold will define the minimum scale setting for plotting this layer in the map when zooming in and out.

Alternatively, you can use the **Marks** Toolbar to include or exclude certain layers and marks from map plotting:

You can also delete marks using this toolbar. Just click the corresponding icon while you hold the **Ctrl key** down.

Map overview window



The map overview window shows a generalized map in a separate map window. In *QV* some ready-to-use overview maps are included which can be selected under **File - Overview** by choosing the area of interest. Clicking the icon switches between the detailed map window and the map overview window.

You can define your own overview maps (see below).

This window gives you a graphical overview of all available maps in your *QV* installation and of the current settings of the AutoMAP function. Each map in the system is marked on the map with a transparent rectangle. The size of the rectangle roughly corresponds to the map extent. So you can see which areas are covered by the map.

If you move the mouse over a rectangle, the name of the map will be displayed in the upper left corner of the window. If you left-click on the map, the map cursor, a small red dot, will be placed at this point. The status line in the main window will be updated correspondingly.

Map overview functions

Double click on a rectangle: The corresponding map is loaded and the map cursor is set to the position you clicked on the overview window.

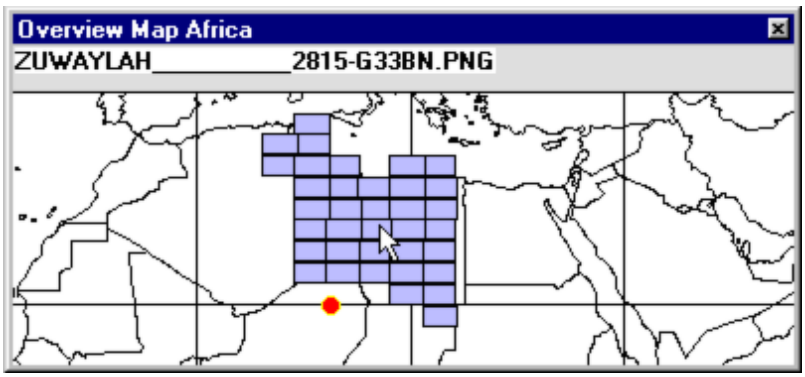
Double click on the map: After enlarging or reducing the overview window, the map will be re-centered. This function corresponds to the **Refresh Overview** command from the pop-up menu.

Right-click on a rectangle: Opens a pop-up menu that will list all maps which are available for this location. In this way you can open a specific map when several maps overlapping in a particular region. The list is arranged by scale. The largest scale is listed first.

Selecting **X-Plorer** from the pop-up menu will link to the database information on this map in the *QV X-Plorer*.

You can also show the rectangles in full color. To enable this clear the tick-mark under **Options - Settings - General** *Overview Window: Map rectangles transparent* and the rectangles will be filled in blue.

This is useful if you want to cover a given area with several maps, so you can see at a glance whether a gap is left somewhere:



AutoMAP- and map overview window

The number of rectangles (maps) depends on the setting of the AutoMAP function. In other words: only the maps which correspond to the current AutoMAP settings will be displayed.

Define your own overview maps

The file *ov.def* in the *QV* directory add your own maps to the predefined ones in the pull-down menu **File - Overview**.
Every new entry has to start with the line
  <usermapdef>
The next line defines the text displayed in the in the pull-down menu
  example: "Québec"
You can enter the name in English, German and French separated by # and QV will display the name according to the current language setting.
  example: "Central Europe#Mitteleuropa#Europe Central"
The next line contains the entire path and filename for the overview map
  example: "c:\programme\TTQV_québec.bm
This line is followed by the northern map border in degree
  example: 60
followed by the southern border in degree
  example: 45
followed by the western border in degree
  example: -80
followed by the eastern border in degree
  example: -56
Western and southern lat/lon coordinates are negative, eastern and northern coordinates positive.

You can also create your own overview maps using a separate definition files. You can choose any file name; however, the extension must end on *DEF and the file must be saved in the TTQV4 directory.
Advantages: Easy organisation, simple conversion to new software updates and the maps will be indicated in the menu by a line.

The overview map should not be larger than 600x400 pixels. It should not contain curved grid lines. It can be a BMP, GIF or PNG format. The map overview will always be shown centered on the startup screen, it can not be zoomed or scrolled.

Maps

Maps

QV works with a wide range of various map types:

- scanned raster maps
- Raster maps on CD/DVD which various companies, such as the topographic maps of the federal geographic institutes
- Satellite images and other orthophotos
- Vector maps from Navteq and Teleinfo (specially compiled for *Touratech QV*)
- Vector maps in the Garmin IMG format
- GIS maps in the SHP or DXF format

With scanned raster maps and other bitmaps, e.g. internet downloads, it is essential that they can be georeferenced. For map calibration the following requirements must be fulfilled:

- A clearly defined grid of longitudes and latitudes or a metric grid in a known standard must be indicated on the map.
- Metric grids can be defined in *UTM* or in various national grid systems such as *Gauss Krüger*, *Austrian Grid*, *Swiss Grid*, New Zealand Grid, British Grid, Irish Grid and Swedish Grid.
- If the related parameters are known, other national grid systems and map datums can easily be added.
- Alternatively, if known, the exact projection can be specified.
- Additionally a calibration tool is available. In this case at least four points with known coordinates must be clearly defined on the map. At maximum 9 points may be used for calibration.

You will find an overview on the maps which are distributed through Touratech on our Homepage (Webshop).

On the subject of accuracy

A careful calibration assumed, *QV* will give you more accurate coordinates than you would be able to extract from a map by other means. However note, that the following factors will influence accuracy:

- The map resolution which is specified in dpi (dots per inch, i.e. the no. of pixels on the screen per map millimeter). The map resolution is determined during scanning.
- The scale of the original map: If, for example, a map has been scanned with 150 dpi, a map pixel in QV will correspond to approx. 0,2 map millimeters in 1:1 zoom display. With a map scale of 1:500.000 this will translate to 100 m in the real word, in a map with 1:50.000 scale this corresponds to only 10 m.
- Many older maps which have been produced by conventional means and were primarily not intended for GPS navigation may suffer from inaccuracies which are related to map design reasons. Please note that inaccurate maps will not become more accurate when being used with *QV!*
- When calibrating a map try to locate the points P1, P3, P7 and P9 as close to the map corners as possible. The mathematical term which approximates the coordinates will loose accuracy outside this square.

Map reference system and map datum

The earth is not a perfect sphere but an ellipsoid, and even this is not symmetric.

In contrast to this, latitudes and longitudes refer to symmetric mathematically defined circles which are evenly distributed over the sphere. However, the earth's radius is not a constant but varies at different place on earth.

To cope with this problem, a radius will be defined when creating a map which fits best to a specific geographic area. And, as the surface of the earth is a spheroid, 2 different radii (semi-major and semi-minor axes) have to be considered.

The map reference system or map datum defines a specific set of earth radii and thus to a specific ellipsoid.

On the basis of this ellipsoid, a map will be created. Also a GPS receiver has to refer to a specific ellipsoid in order to calculate a position. Several map reference systems with their specific advantages and disadvantages are in use, not only for different geographic areas but also within the same country.

As a direct consequence, the coordinates of two maps which cover the same region and which are compiled with different map reference systems, the *same* point will have *different* coordinates.

Or, if you switch your GPS unit to another map datum, the coordinates will *change* although your location is exactly the *same*.

Therefore, if you want to specify your position with a GPS receiver in a map, you have to know the map reference system and configure your GPS unit accordingly.

Meanwhile, the map reference system *WGS 84* has been widely accepted as a global, international standard but there are many maps which refer to another map datum. In general, local maps will <u>not</u> refer to *WGS 84*.

***QV* will facilitate all the troubles encountered with different map reference systems a lot.**

As all GPS units and *QV* will work internally based on *WGS 84*, you do not need to convert your GPS unit but retain the basic *WGS 84* settings, regardless of the map datum being used in a *QV* map. The required coordinate conversion will be handled by *QV* together with your GPS unit.

When calibrating your scanned map, you should enter the map datum whenever available (unfortunately it is not often the case).

Then, when you save coordinates in *QV* and transfer them to the GPS unit, *QV* will automatically convert them to WGS 84.

And if you extract coordinates from your map, they will also be automatically converted to the map reference system which you have currently set.

If the datum is not specified on your map, it is often worth asking the map manufacturer. The accuracy of *QV* may remarkably increased by setting the adequate map datum! Most map publishers will give you this information.

German maps are usually based on the *Potsdam* map datum, French IGN maps on *New French triangulation*.

If you save waypoints in the *QV* map display, the necessary conversions are performed automatically. When manually entering waypoint coordinates, you can select the map datum to which the coordinates refer in the dialog input box.

Legend

QV can handle one map legend for each directory. You can view this legend by clicking on the **Legend** icon in the symbol bar.

For this purpose you can create a bitmap with the scanned legend of your map in your Bitmap Editor program, i.e. *Paint Shop* or *Photo Paint*. Save this bitmap as a *GIF*, *BMP*, *TIF* or *PNG* file with the name *LEGEND.BM* in the map directory and *QV* will show this legend in an own window after clicking on the **Legend** icon.

You can save another bitmap named *HINTS.BM* in the same directory which will be shown if you click the **Legend** icon with the right mouse button.

Additionally you can create legend and hint files in different languages. In this case name the files according to the following scheme, i.e. *LEGEND_D.BM*, *LEGEND_E.BM* and *LEGEND_F.BM* or *HINTS_D.BM*, *HINTS_E.BM* and *HINTS_F.BM*. *QV* will then show the file according to the language setting.

Search order

First of all, *QV* will search for files in the map directory of your hard disk with the names *LEGEND.BM* and *HINTS.BM,* respectively. If these files cannot be found, *QV* will search for *LEGEND_x.BM* and *HINTS_x.BM* in the same directory.

Import of new maps to QV

Import of single maps

The simplest way to achieve this is a simple Drag&Drop operation: Just drag the map file (i.e. the bitmap file on your hard disk or CD/DVD drive) from the *Windows Explorer* into the map table of your choice in the *QV X-Plorer* window.

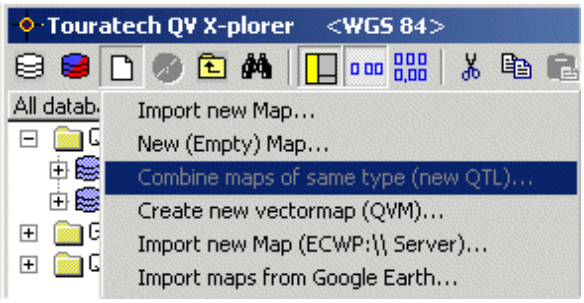
Alternatively you can mark the map table of your choice in the *QV X-Plorer* and select **Import new map** from the pop-up menu (right-click on the map table) or click the icon and then select the desired file from the file selection menu.

If the map is already calibrated, it will directly be added to the *X-Plorer list window*.

Otherwise the calibration window will open if the map has not been georeferenced before.

For a description on the georeferencing procedure please refer to the chapter Calibrating of Maps.

In this menu, there are some more options to create new maps:



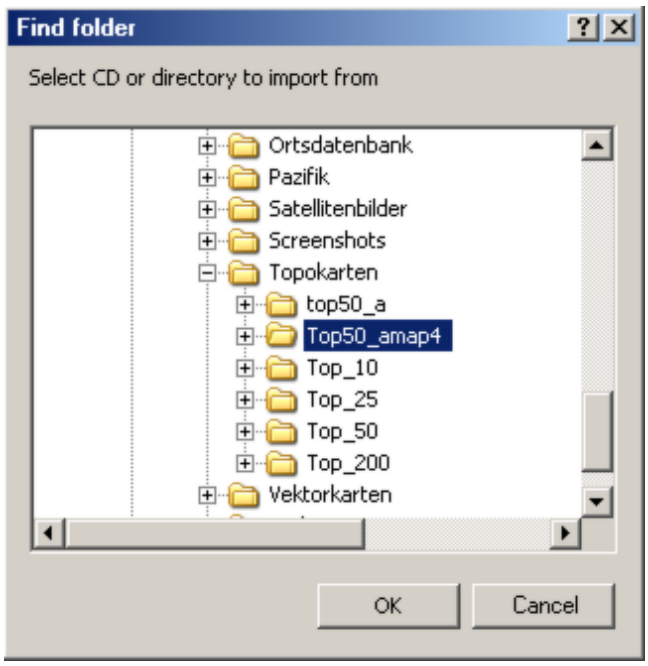
Import new Map...	see above
New (Empty) Map...	see chapter New empty map
Combine maps of same type (new QTL)...	see chapter QTL-Format.
Create new vectormap (QVM)...	see chapter QVM.
Import new Map (ECWP:\\ Server)...	see chapter ECW/ECWP
Import maps from Google Earth...	see chapter Capture mapdetails from Google Earth

Import of multiple maps from CD/DVD or importing a whole map directory

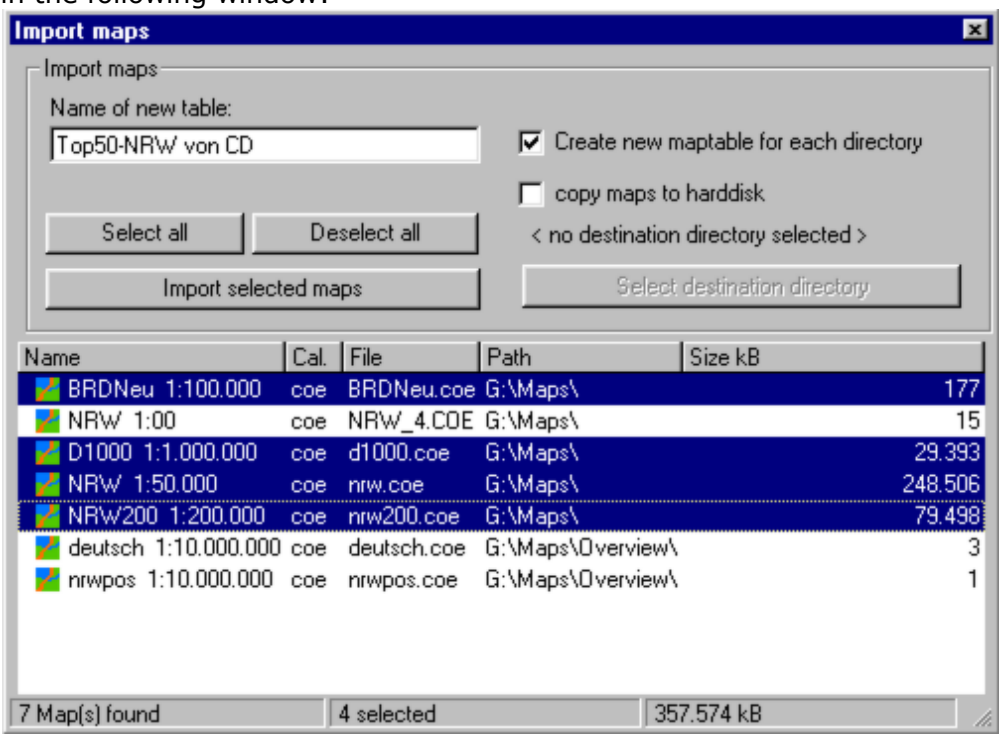
If you use this option every CD/DVD will be added as a new separate map table as part of the selected database.

To accomplish this option please proceed as follows:

- Select the database in the *X-Plorer tree window* to which the new map table(s) should be added.
- Click the **Import Map CD-ROM or Directory** icon in the *X-Plorer* symbol bar.
- Choose the CD/DVD drive, path and directory in which the maps are located in the file selection window and click **OK**.



- *QV* will now scan the selected path and directory for calibrated maps and list all suitable maps in the following window:



- Now select all maps to be imported or choose **Select all** if you wish to import all available maps.
  If you wish, you can modify the default name in the field for the name of the new map table.
- Click on **Import selected maps** to start the import procedure.
- The maps will now be imported. When finished, the window will close and the new map table will be listed with all maps in the *X-Plorer*.

If you tick-mark **copy maps to hard disk** all maps will be copied to your local hard disk drive. In this case the original CD/DVD will later on not be required. However note that this option will require sufficient hard disk capacity (the amount of required hard disk space will be listed in the status line)!

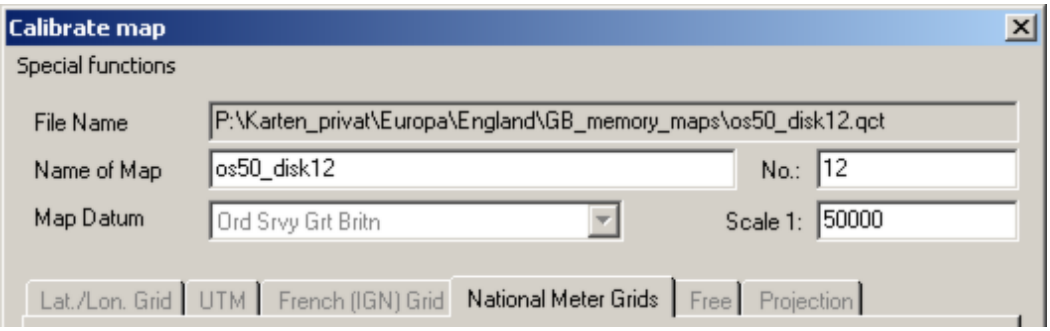
Furthermore you have to define a path and directory to specify where the maps should be stored.

Click the **Select destination directory** for this purpose and choose a path and directory in the file selection window.
If several directories are included on the map CD/DVD you can copy the directory structure by tick-marking the **Create new map table for each directory**. In this case the directory name will be added to the specified table name during import.

Calibrating Maps

Before using in *QV*, a map must be calibrated. This requires the identification of the map type and its reference system and the assignment of specific points to known coordinates. This is essential in order to georeference the map, i.e. to enable QV how to transfer map coordinates to screen coordinates and vice versa.

First of all select the calibration type by choosing the corresponding Tab.



- longitude/ latitude grid
- UTM grid
- IGN map with French Grid
- National metric grids
- Free calibration
- Specific Projection

Enter additional information:

Map Name	This is the map name as indicated in the *X-Plorer*.
No.	An optional field for a map no. This will be notified only in the *X-Plorer*.
Scale	An optional field for the map scale. The scale will be indicated in the *X-Plorer* and the map selection menu.
Datum	Highly important, although often difficult to identify! If your tracks are shifted by 100-300 m, it is very likely that you have specified the wrong map datum. If you have no idea about the map datum, try *WGS84*. See chapter Map reference system and map datum.

Guiding lines

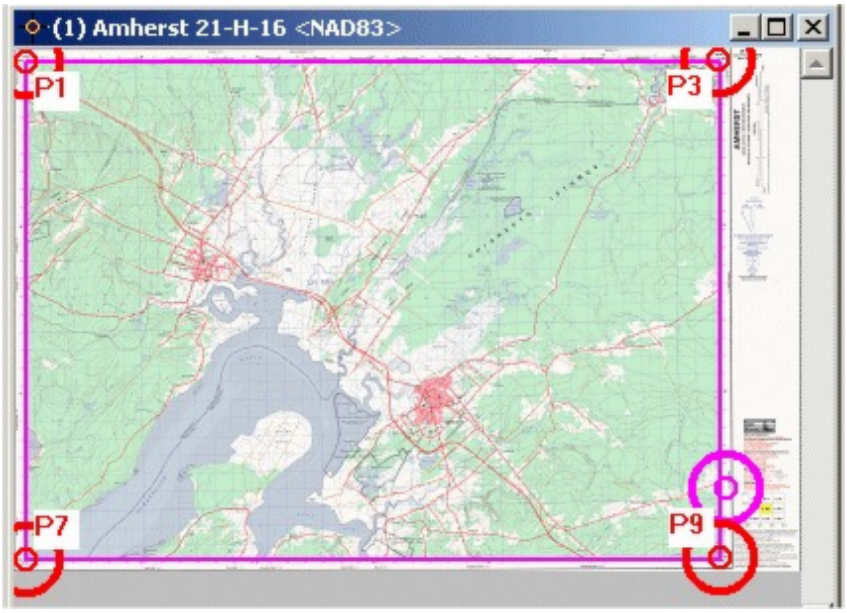
During calibration, *QV* will indicate points that have already been calibrated as marks (red circle with the calibration point no.) and purple and yellow guiding lines starting from them for an easier identification of the remaining calibration points.

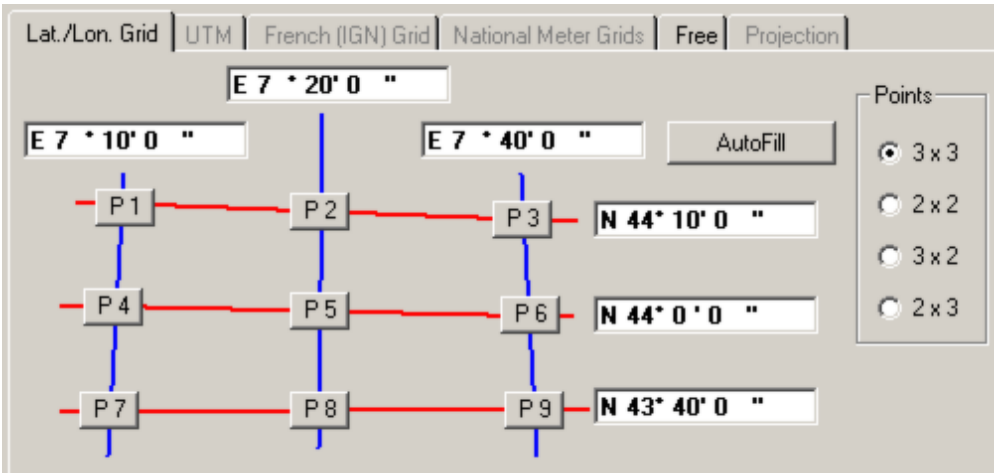
The yellow lines radiate from a calibration point towards all directions extending up to the map border while the purple line connects two neighbouring calibration points.

New calibration points are always close to the intersection point of two lines.

The lines are transparent so that the actual grid line (latitude or longitude) can still be seen. With colored maps, the guiding lines might be difficult to detect. In this case, deactivate **Help lines transparent** in order to plot them as solid lines.

Latitude/Longitude Grid





Depending on the selected point raster (2x2 ... 3x3), a sketch shows a grid consisting of 2-3 latitudes (red) and 2-3 longitudes (blue). The intersection points are numbered from P1 ... P9 and are indicated as buttons. In alignment with the lines you find the input fields for the corresponding coordinates. On the right hand side of the window you can adjust the point raster between 2x2 (4 calibration points) and 3x3 (9 calibration points). Please note that the points P1, P2 and P3 must be located on the same latitude while the points P1, P4 and P7 have to follow the same longitude, etc.

Please study your map carefully. Take a long ruler and place it along the grid lines. If the grid lines build a straight line, a calibration using 2x2 points is sufficient. As soon as one or more grid lines are curved, you must select 3x3 calibration points to achieve a better accuracy.

3x3 Points:

In this mode you must calibrate 9 points in total and enter the coordinates for 3 lines of latitude and longitude each. This method is for large scale maps with curved meridians. You will need at least 3 latitude and longitude lines printed on the map. And this is how you proceed: Press the **P1** button and the map window will pop to the front. Click on the intersection point of the meridians on the map. Then, the calibration window comes back to the front and you can enter the corresponding longitude. Please note that all coordinates must be entered in the currently defined units. However, the unit setting can be changed under **Options - Settings - Unit**. Please enter N or S respectively E or W in the first field.

If a calibration point has already been entered, the labelling of the P button changes from bold, e.g. **P3** to standard, e.g. P3; so you can see at a glance which points are still to be calibrated.

Repeat these steps for all 9 points and all 6 degree fields and press **SAVE** when finished. If you

have forgotten a point or a field, *QV* will remind you.

If the calibration was successful, the map will be closed and automatically re-opened.

2x2 Points:

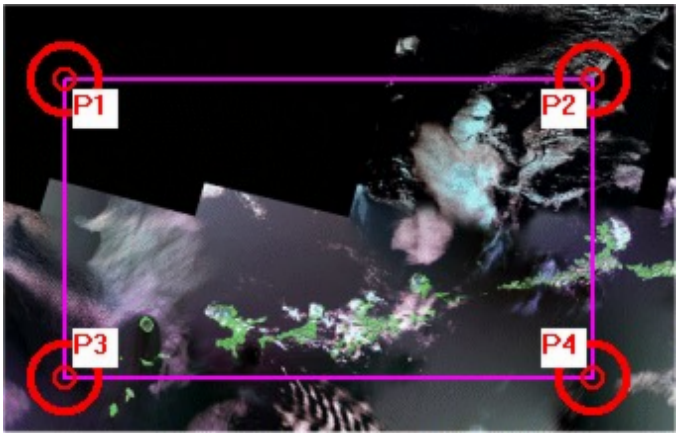
In this mode, you only have to calibrate 4 points in total and enter 2 lines of latitude and longitude each. This method is for small scale maps where ALL meridians are absolutely straight. You will need at least 2 latitude and longitude lines plotted on the map.

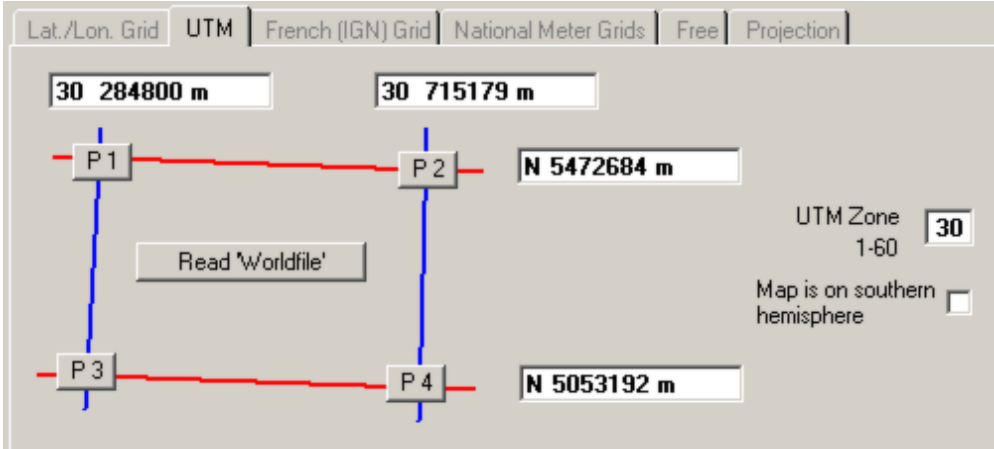
Proceed as described for 3x3 points. However, you only need to enter points P1, P3, P7 and P9.

3x2 or 2x3 Points:

Use this setting if only 2 longitude and 3 latitude lines or 3 longitude and 2 latitude lines on your map. Otherwise proceed as with 3x3.

Universal Transverse Mercator (UTM)





The UTM system divides the earth into 60 vertical strips (UTM zones), each 6° wide. UTM Zone 1 extends from 180°W to 174°W, Zone 2 from 174°W to 168°W, etc.

In the North-South direction, strips with a width of 8 degrees of latitude are labeled by letters, ranging from "C" (80°S-72°S) to "X" (72°N-80°N).

The coordinates are expressed in meters. It is counted northwards from the Equator (which has the coordinate 0) upwards and to the south from 10,000,000 downwards. In East - West direction, the middle of the zone is always 500.000, again units refer to metres.

Examples: The coordinate N 1000 E 501000 in zone 1 lies exactly 1000m north of the Equator and 1000m east of 177°W. The point N 9.999.000 E 499.000 lies exactly 1000m south of the Equator and 1000m west of 177°W.

So you have to select the buttons P1 - P4 one after the other, click on the points in the map and enter the corresponding latitudes and longitudes. You will find the values for the map datum and UTM zone on your map. Unlike maps with latitude and longitude coordinates, the map datum is usually specified for UTM maps. Be sure to select the corresponding one from the Datum/Ellipsoid list.

If your map covers a UTM zone boundary, you have to decide on one zone. A map calibrated in UTM only gives accurate coordinates within this zone! If you need the coordinate in both zones, try another projection or create a copy of the map under another name and calibrate the other UTM zone with the copy.

Pixel-Offset: Normally leave this field empty or enter "0".

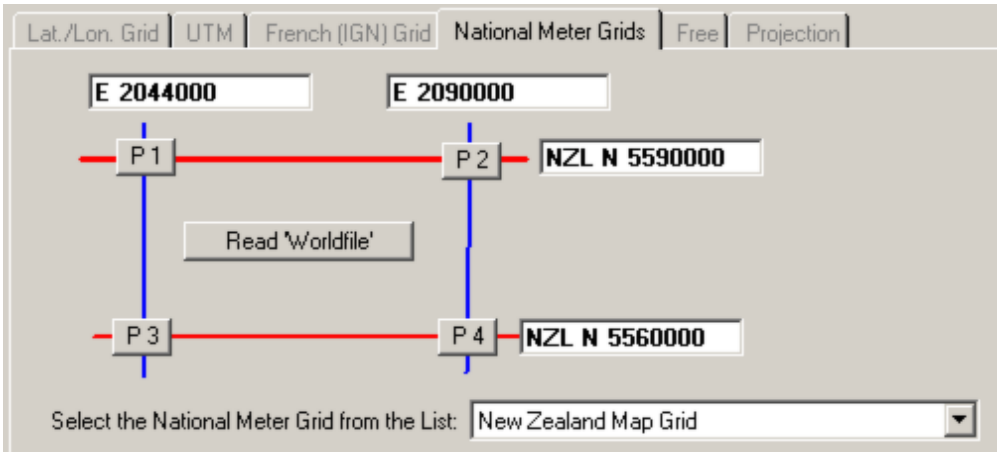
Importing calibration data using the **Read Worldfile** function is possible with this coordinate system (see below).

French Grid (IGN maps)

These outstanding maps produced by the french National geographic Institute use the French grid. This is indicated by the "gr" behind the degree numbers on the map margins. This is in principle a normal grid with latitude and longitude coordinates but the circle is divided into 400 gons instead of 360° and the zero meridian is referred to Paris.

Therefore, if you want to calibrate an IGN map, select the corresponding tab and calibrate just as for normal longitude and latitude degrees in a 2x2 or 3x3 raster, but enter the gon values as specified on the map. When you calibrate IGN maps, the option "New French Triangulation" is automatically enabled.

National Grids



Although the international trend in maps is clearly going towards standardised latitude and longitude coordinates in the WGS84 system, there are still many maps which coordinates that refer to so-called national grid systems.

Nearly every country has its own grid definition. The unit for these grids is in metres. Longitudes are specified as easting and latitudes as northing.

The advantage of these nation grids is the linear scale when working with a paper map. Due to the rectangular nature of the grid, distances can easily be extracted from the map with a ruler.

Luckily, all these grids are based on uniform formulae and only differ in their various parameters.

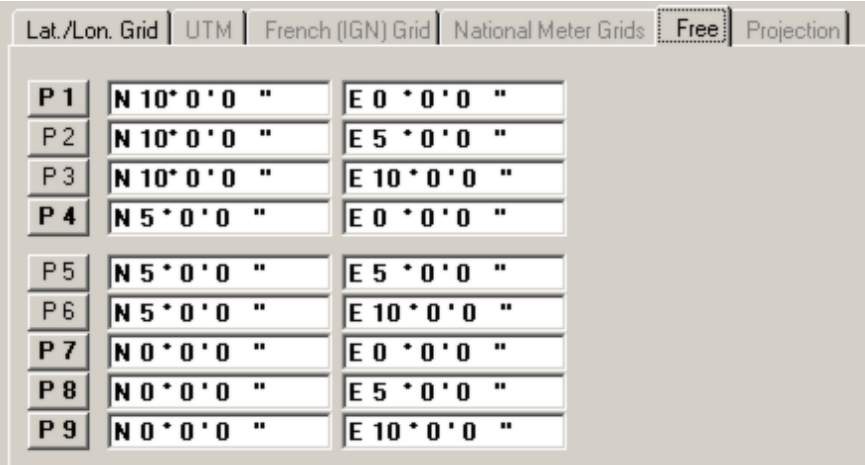
QV comes with most common grids already defined. Additionally, you can create any new grid system you like in the *QV X-Plorer* and save them.

So to calibrate a map in a national grid, select the required grid from the list, click on the 4 points P1...P4 and enter the appropriate coordinates in metres into the corresponding entry fields.

A national grid is always defined together with a specific map datum. When selecting a national grid in *QV*, the appropriate map datum will automatically be set and cannot be changed.

Importing calibration data using the **Read Worldfile** function is possible with this coordinate system (see below).

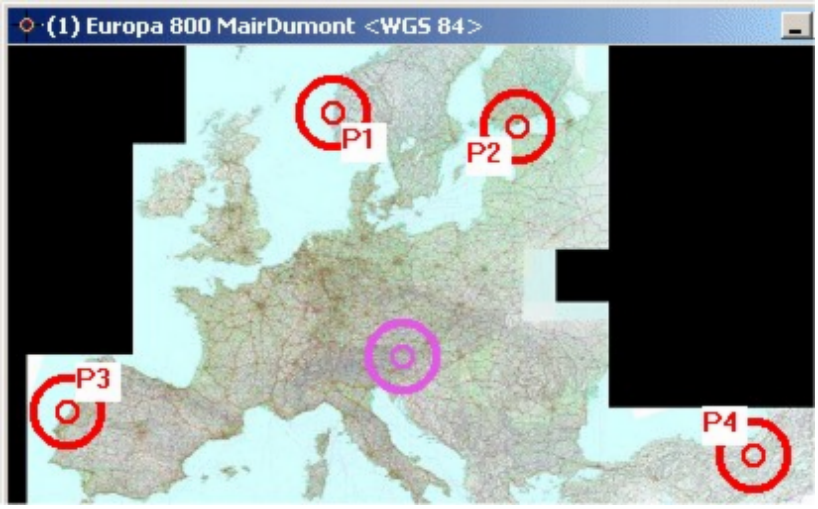
Free Calibration

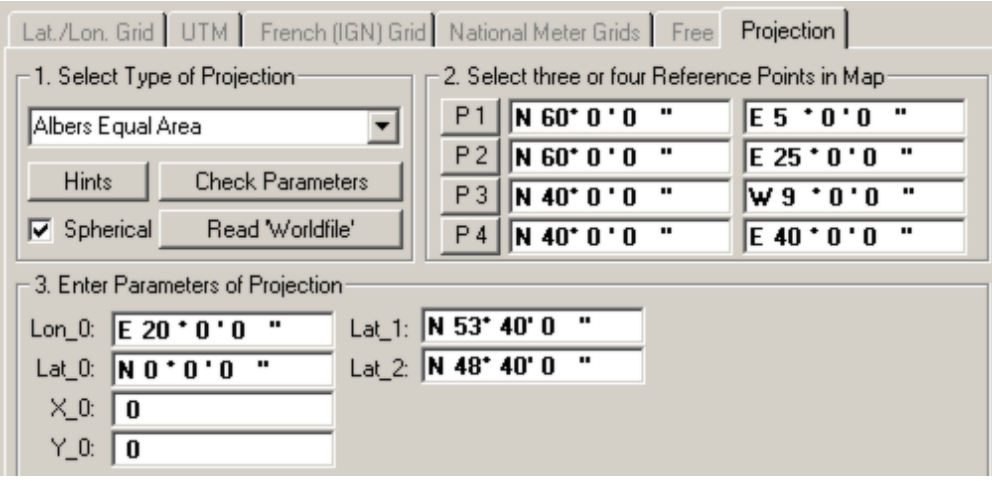


This mode is used to calibrate maps or satellite pictures without a grid system plotted.

At least the coordinates of 4 points must be known, which should be as close to the map corners as possible. Each additional point will increase the accuracy.

Calibration according to a specific projection





If the projection on your map is clearly specified including all required parameters, you can also calibrate the map using this option.

The advantage is that this calibration type is very accurate, even with large scale maps, e.g. maps with a world or continent coverage. A three point calibration is sufficient if a all projection parameters are known.

First of all, select the type of projection from the list.

Depending on the type of projection, further parameters must be entered. The corresponding input fields appear and must be completed.

Now, click on three calibration points distributed as evenly as possible over the map and enter the coordinates of these points.

The fourth calibration point P4 is not necessary for exactly scanned maps. However, the paper map might have been distorted as a result of scanning or exposition to heat or humidity. In this case, you can optionally enter P4 to increase accuracy. Points P1 to P4 should correspond to points close to all four corners of the map.

For a more specific explanation of the individual types of projection, click on **Hints**.

Copying coordinates

With free calibration and calibration according to a specific projection, the coordinates of existing points such as waypoints, trackpoints or points of the geographic database can be used by copying them from the *X-Plorer* or from another map which has already been calibrated.

Copying from the *X-Plorer*:

Right-click on the desired point in the *X-Plorer* list window and choose **Copy coordinate** from the pop-up menu.

Copying from a second map window:

Right-click on the desired mark in the map window and choose **Copy coordinate** from the pop-up menu.

Return to the calibration window, right-click into coordinate entry field and choose **Insert point** from the pop-up menu.

Further details can be found in the *Clipboard* chapter.

Easy map calibration with Worldfiles

A world file is a small text file that contains information on a raster map for georeferencing. This information is not complete. It contains the coordinates of the upper left corner and the size of a pixel in the map coordinate unit:

<u>Example:</u>

7.35294118

0

0

-7.35294118

2923003.67647059
6228996.32352941
Unfortunately, no information is included on the type of projection, or the grid and map datum reference. However, a world file can simplify calibration because it renders the entering of the calibration points unnecessary.
Please note, that the projection parameters or the grid system and the map datum must be known from other sources.
Proceed as follows:

- Select **Import new map** in a *QV X-Plorer* map table and select the raster map to be imported. The map will be loaded and the calibration window will open automatically.
- Select the correct projection or grid and enter the appropriate parameters.
- Now click on **Read Worldfile** and select the relevant world file on the hard disk. Normally it has the same name as the bitmap but with the suffix TFW.
- Now the 4 calibration points are automatically set in the four map corners and the corresponding map coordinates are calculated and entered.
- Finish the map calibration by clicking **Save**.

World files can only be use in *QV* with the following calibration types: UTM, National Meter Grids and Specific Projection. However, the calibration type must be known.

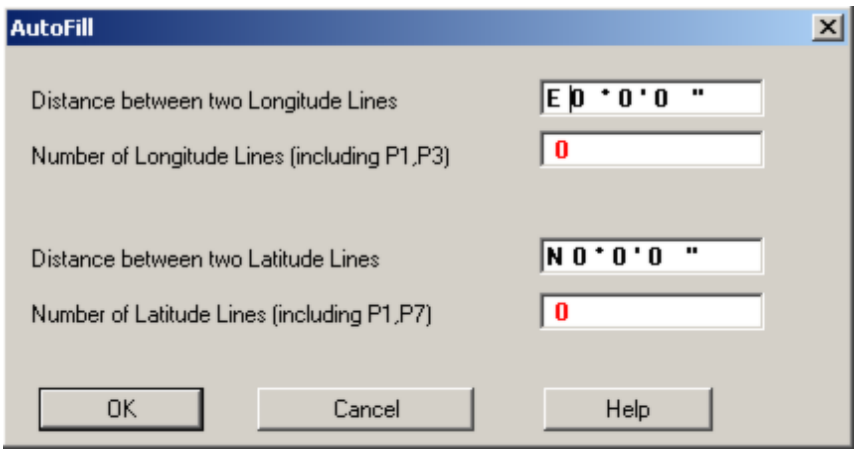
A few more hints on map calibration

- Another argument for placing the calibration points P1, P3, P7 and P9 as close to the corners as possible is the fact, that the formulae used are less accurate outside these points.
- The order in which you enter the calibration points is absolutely irrelevant. You can also calibrate each point as often as you like. If you press a P button for the second time, a small purple circle in the map indicates the point that is being calibrated at the moment. You can then correct the placement of this point if you have made a mistake.
- You can switch at any time between the various point rasters, eg. 2x2, 3x2, 2x3 and 3x3. Internally, *QV* will always calculate in a 3x3 point raster.
- Even if the calibration is saved, it can subsequently be corrected. Simply call up **Calibrate Map...** from the *File* menu.
- The map calibration is saved in the database and a CAL file will be created.
- The map itself (i.e. the bitmap file on the disk) will not be changed. If you edit the map after calibration in a graphics program and change the size, you must repeat the calibration.
- The map calibration file can also be exported. See *Export Map Calibration*.
- Maps which extend over the date line in the Pacific Ocean (W180° and E180°, respectively) and maps covering the north and south pole can only be calibrated if the specific projection is known. All other calibration types are incompatible with such maps.

It is important to check the calibration! Follow the latitudes and longitudes with the mouse pointer and watch the coordinates which are specified in the status line. If they are not plausible, repeat the calibration.
Another test: Double click on a map point which is not close to a calibration point and save this point as a waypoint. Plot this waypoint in the map and check whether the mark is in the same place. If you have GPS tracklogs from this area plot them in the map and check for their correct placement.

Autofill

During calibration, this function calculates the coordinates of other calibration points automatically after you have entered the longitude and latitude of point P3.



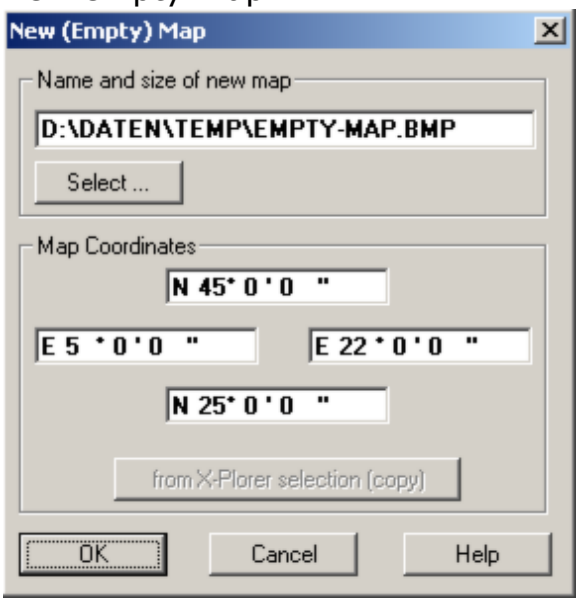
Follow this procedure:

- Mark all the points P1 - P9 on the map.
- Enter the longitude and latitude of point **P3**.
- Select **Autofill.**
- In the dialog window that will open enter the distances between two consecutive grid lines on your map in degrees, minutes and seconds.
- Enter how many grid lines the calibration covers. 2 is the minimum value!
- Select **OK**.

The Autofill function has now automatically calculated the fields for **P1**, **P2**, **P6** and **P9**.

This function is particularly helpful and time saving if you want to calibrate several maps of the same type.

New empty map



This function is intended for cases where no map at all is available for a given area. In such a case an empty map will be created to allow for a plotting of marked data from the *X-Plorer* such as tracks and routes.

You can access this option by selecting **New (empty) map...** from the pop-up menu after a right-click in the *X-Plorer* tree or list window. Specify the path and name where this map should be created and define the map extent by entering the coordinates. Note that the input fields are ordered according to the compass directions to define the map extent towards N, W, E and S (see example above).

Alternatively you can also use the button **From X-Plorer selection (copy)** if you have marked suitable data beforehand in the *X-Plorer* and have copied them to the Windows clipboard by clicking the icon.
The map extent will then automatically calculated by *QV*.

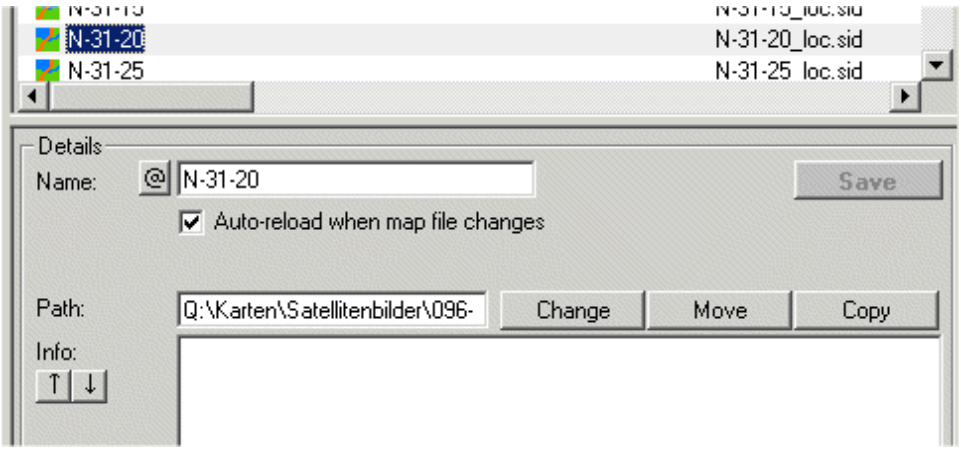
Confirm with **OK** when you have finished your entries. The map will be opened and - provided that you used the **From X-Plorer selection (copy)** function - the corresponding data will be plotted.

Remark: You can alter the map extent later on at any time by choosing **Calibrate Map...** from the pop-up menu after a right mouse-click. Just enter new values (without pushing the P1-P9 button).

Auto-reload map

With some applications, e.g. images from weather satellites, it may be useful to automatically have the map-window updated, when the map-file has changed.

For that, activate the switch **Auto-reload when map file changes** in detail area from these map:



When this map is open, QV checks every 30 seconds, if the mapfile on the hard disk has changed. If so, the map will be reloaded.

Current mapdetail and loaded marks keeps unchanged.

Only the content of the map can change, not the calibration.

Raster maps

Raster formats

QV can process a wide spectrum of different raster formats and new formats are added continuously. You will find an overview on our Homepage and Shop in the map section.

Standard raster maps

These include general bitmap formats like PNG, JPG, BMP, etc. Such formats are generated when scanning paper maps. Such bitmaps files have to be calibrated in *QV* in order to use them as a map.

Standard raster maps must always be loaded into the PC's RAM as a whole. Thus, depending on your hardware specification, the maximum map size will be limited. So, the more RAM is installed in your PC the better.

Raster maps in the TIF format make an exception: *QV* can also load them in parts. See chapter TIF maps.

Geo-raster maps

Some special raster formats have been developed which include the calibration information in the file:

BSB(KAP), GeoGrid, GeoTIFF, etc. During import, these maps are automatically georeferenced in *QV*.

Optimized Geo-raster maps

Raster maps always encounter the problem that the image quality will vary with the zoom scale. Some optimized raster formats are available which compensate for this loss in quality by implementing different zoom scales in a preprocessed inscription in the file format. The performance and quality during zooming is remarkably increased.

These optimised geo-raster formats include: SID, ECW, BAYO and the proprietary *QV* format QBR.

Raster maps in one of these formats offer optimum performance and are usually calibrated and

ready for use.

QTL format

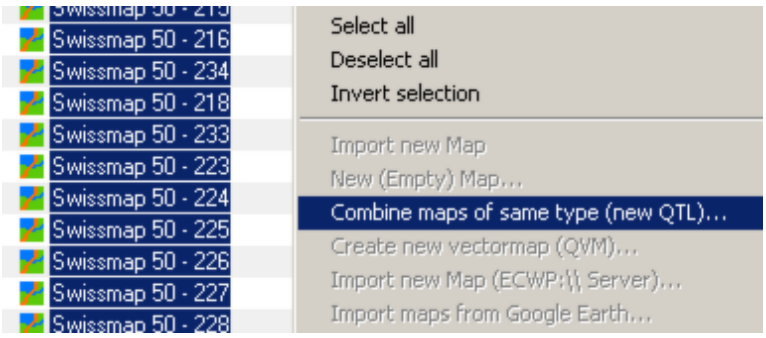
Basically a QTL file is a textfile which contains a list of maps which all refer to identical grid and resolution calibrations and which can be imported as a new map. *QV* will handle such a file as a SINGLE map where the various maps will automatically be loaded as required.

> Note that all individual maps must be of the same type, i.e. identical size and metric calibration, e.g. SwissMap version 2.

Creating a QTL map:

Note, that all individual maps must be imported first.

- Mark all individual maps in the *X-Plorer*.
- Choose **Merge maps of the same type** from the pop-up menu:



- The maps will then be processed. A new file with a QTL extension will be created in the same directory and directly be imported to the same map table:

- This new file functions as "control file" which loads the adequate tiles automatically. In future applications, it is sufficient to open this file only.
- Thereafter, you won't need the original files anymore. You can delete them from the *X-Plorer*. However do not delete them from your hard disk because "control file" the will refer to the physical files on the hard disk drive.

> Please note that the performance of theses maps is restricted. You should avoid zooming out to huge map extents because all affected map tiles have to be loaded in full resolution and rescaled in your RAM memory.

ECW/ECWP Maps

ECW Maps

ECW refers to "enhanced compressed wavelet" which is a data compressing method similar to the JPEG standard and used for facilitate the handling of bitmaps. It only works with TrueColor bitmaps and is therefore mainly used for aerial photos and satellite images. A big advantage is the virtually unlimited image size due to the fact that the extracting utilities only process the image section which is currently in use but not the entire map.

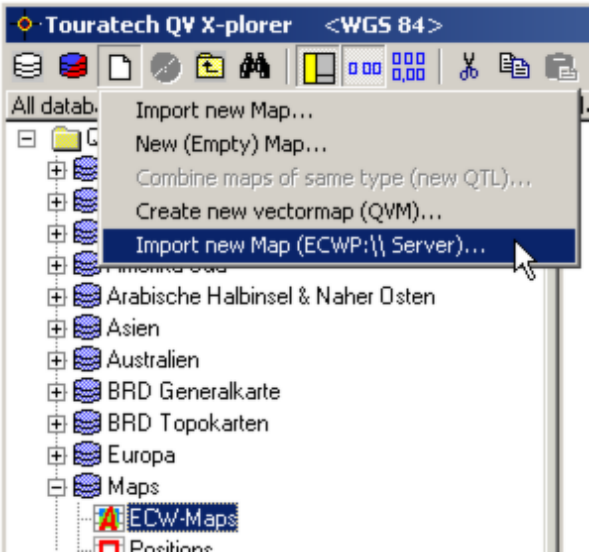
An ECW map may include georeferencing information, i.e. the maps can already be calibrated.
The ECW format has been developed by the company *ER-Mapper* (http://www.ermapper.com) but is freely available.
QV supports maps in the ECW standard with full functionality. If the ECW map contains georeferencing information it can directly be opened and will not require additional calibration. Non-calibrated maps can also be opened but require manually georeferencing using the standard *QV* map calibration tools.

The libraries for processing ECW maps originate from *ER-Mapper*.
QV will exclusively use these original functions.
A couple of other software products are available on the market which will also offer ECW support. In order to avoid conflicts we follow the recommendation of *ER-Mapper* and provide the setup utility for the original libraries. This program is named **ECWActiveXControls.EXE** and has to be installed once to your systems. You will find it on your *QV* CD, on the *QV* homepage and of course also on the *ER-Mapper* website under downloads.

ECWP Maps

As a new function in QV, you can now also use maps from any ECWP-Server. In this case the map will not be stored locally but will be accessed through the Internet when opening the map. (The same is true with an Intranet access in case you operate your own ECWP server).

- To import such maps, first of all choose the map table to which the map should be added and choose **Import new map (ECWP:\\Server)...** from the pop-up menu **New** (you can also access this menu with a right-click on the map table):



- Specify the complete link in the following input box:

- Click **OK**.

QV will then connect to the server and add the map to the map table.
Alternatively you can simply drag and drop a link into the map table. You can try with this text:
ecwp://www.earthetc.com/images/geodetic/world/landsat742.ecw
Just drag-and-drop it to an *X-Plorer* map table.

If you open an ECWP map, the map window will be requested through the internet which will take some time.
A number in the upper left corner of the map window will indicate the progress of the loading in percent. The resolution of the image will increase accordingly. You can shift to another area also if the map window has not be completely loaded. Thus comfortable working is possible also through the Internet.

Remark: Since with ECW maps only the map window currently needed will be loaded scrolling in the map is remarkably slower as compared to normal maps which are stored on your local PC. A high performance CPU and fast hard disk drive will increase scrolling performance!

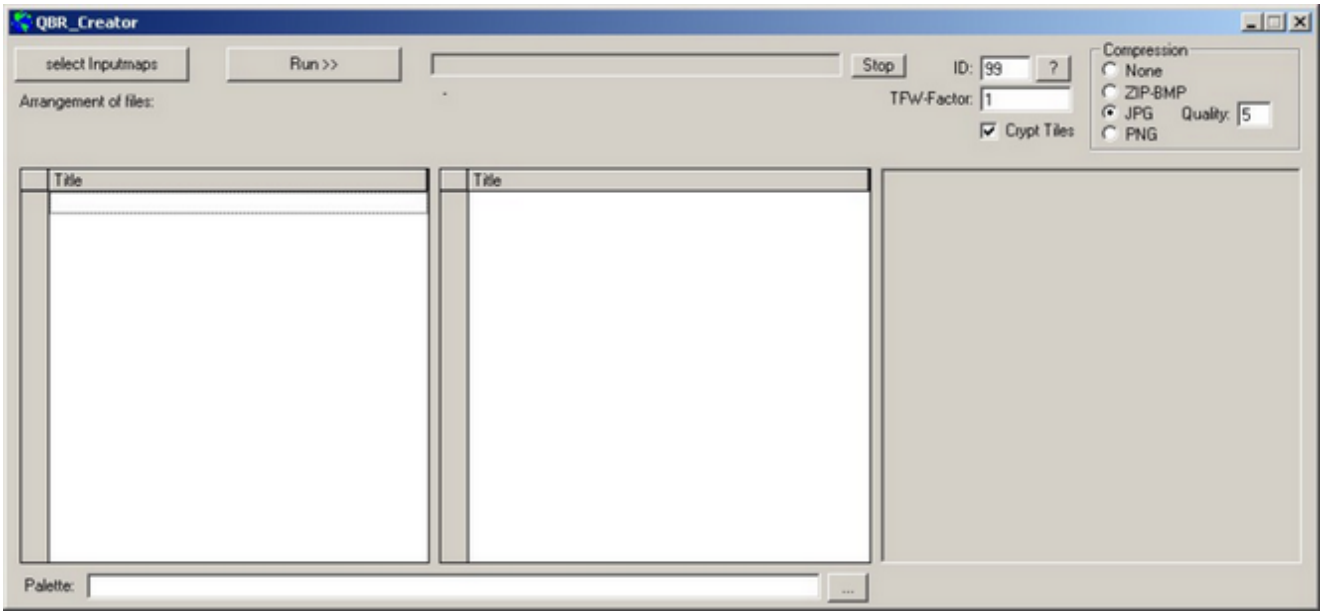
QBR format

The QBR format is a proprietary *QV* raster format for maps which can be virtually unlimited in size. All our own raster maps such as Europe 1:800.000 or our General maps in 1:200.000 were produced in this format.

The characteristics of this format are unbeaten performance in any zoom scale.

The professional version of QV features the utility to create maps in the QBR format.

To compile such a QBR raster map, you will need tiles of the entire map extent with identical size and a perfect fit on a pixel level. The map projection must be known and a Worldfile must be available.



TIF maps

Starting with *QV* version 4.0.42 or higher, TIF maps can be processed in two different ways:

Entirely loaded into the PC memory

This is the usual way. *QV* will load the map entirely into your PC RAM-memory. The maximum loadable map size will be limited by the RAM-memory capacity of you PC. If loading of the entire map fails, *QV* will automatically try to load a map clip.

Partially loading of a map

Using this method, only the sections of a TIF map will be loaded which are currently visible. The main advantage is the reduced hardware requirements and the virtually unlimited TIF size. However, the performance is reduced when compared with entirely loaded TIF's.

A TIF file can only be loaded partially when it meats the following requirements:

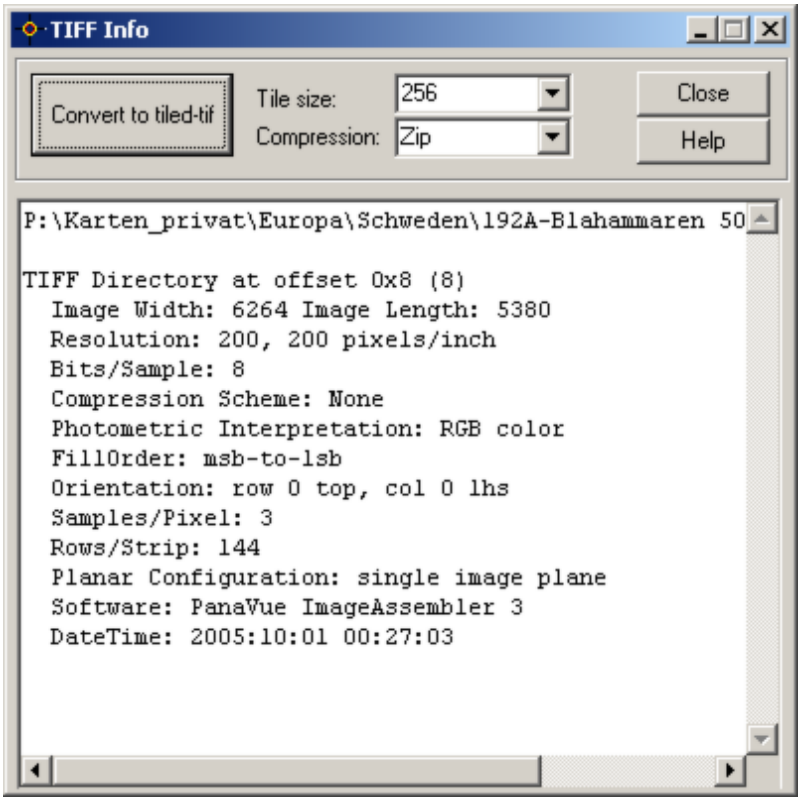
- it has been processed in slats
- it has bee processed in grids

Gridded TIF's are optimally suited for *QV* since they combine maximum performance with unlimited file size.

Under **Options - Settings - Map** you can define in the field **Max. Tif-size (pixel)** a threshold from which size onwards *QV* will not load entire TIF maps. For example by entering 8000, QV will only load an entire TIF map if the width and height of the tif file are below 8000 pixels.

Tif-Info

You will find this tool in the pop-up menu of a TIF map in the *X-Plorer*. In this window all relevant info on the TIF file are summarized.



The relevant information in this window is **Tile Width: xxx Tile Length: yyy**. If this line is missing, you are dealing with a map which has NOT been processed in grids. You should then convert this map in order to improve performance in *QV*:

Just specify the grid size and select the compression type and click on **Convert to Tif tiles** in

order to start the conversion process. The original file will be saved under the name *_*original.tif*, the new tiled map will be saved under the original name.

Note that a gridded TIF cannot be converted back into another type of TIF-file. Furthermore, most graphic packages or bitmap editors will not be able to open a gridded TIF. So be sure to archive the *_*original.tif* file at a save place in case you wish to perform future editing.

Also note that this tool is only available in *QV Power User* and *QV Professional*.

Vector maps

Vector maps

Vector maps differ from the usual raster maps and bitmaps which only consist of pixels by the fact that they consist of geometric elements such as points, lines and areas with corresponding coordinates. Thus, a road is not a consecutive line of red pixels but a list of coordinates.

Due to this fundamental difference, vector maps have not a fixed layout, they are not drawn until a map is viewed. So they can be adapted to the scale and needs of the user.

Therefore you can choose which information (layers) are to be drawn and in which detail. The amount of details will generally be adapted to the zoom scale in order to avoid an "overloaded" layout. So if you zoom to the whole of Europe only highways will be plotted while with increasing zoom levels more and more details will appear.

QV is compatible with various vector maps:

- Navteq (in a special QV edition)
- Teleinfo (in a special QV edition)
- Garmin IMG and TDB files.
- The Polish MP format
- SHP files (ARCVIW/ARCGIS/ARCINFO standard)
- DXF files (CAD standard)
- QVM files as a proprietary QV vector format with an integrated compiler to convert SHP into QVM files.

In contrast to raster maps, vector maps offers much more features:

- Navteq and Teleinfo maps offer Routing Functionality and can be used to find addresses.
- A special Navteq edition even offers voice-guided autorouting capabilities.
- Garmin IMG maps can be uploaded to Garmin GPSMAP units.
- All vector maps can be superimposed as Overlay on raster maps and satellite images.

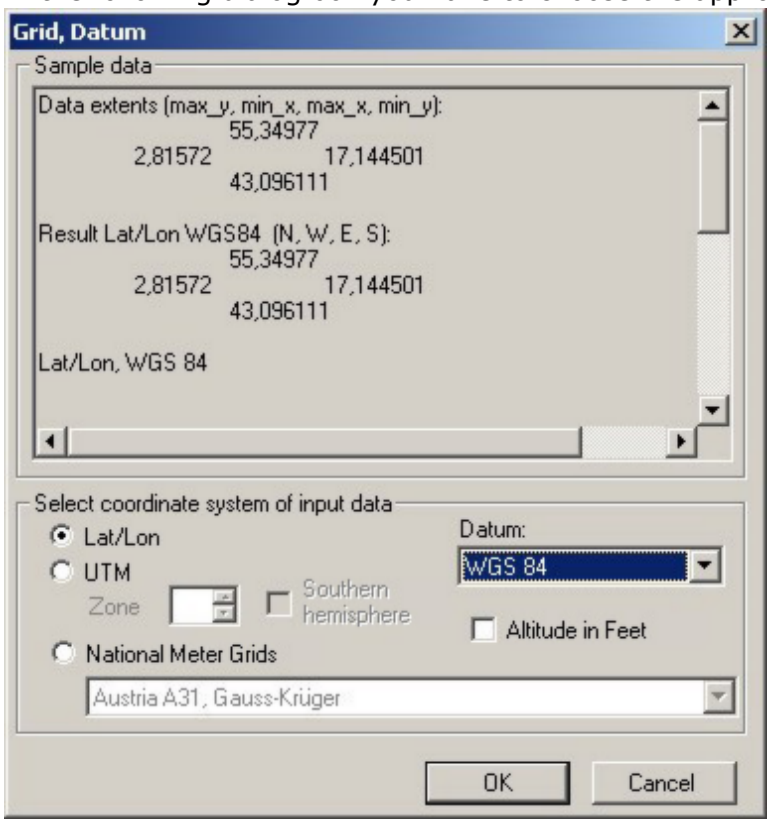
SHP - Files

SHP files can be opened as maps, be imported as drawing or be overlaid on any raster map. You can also convert them into the *QVM* vector format.

Import as a drawing

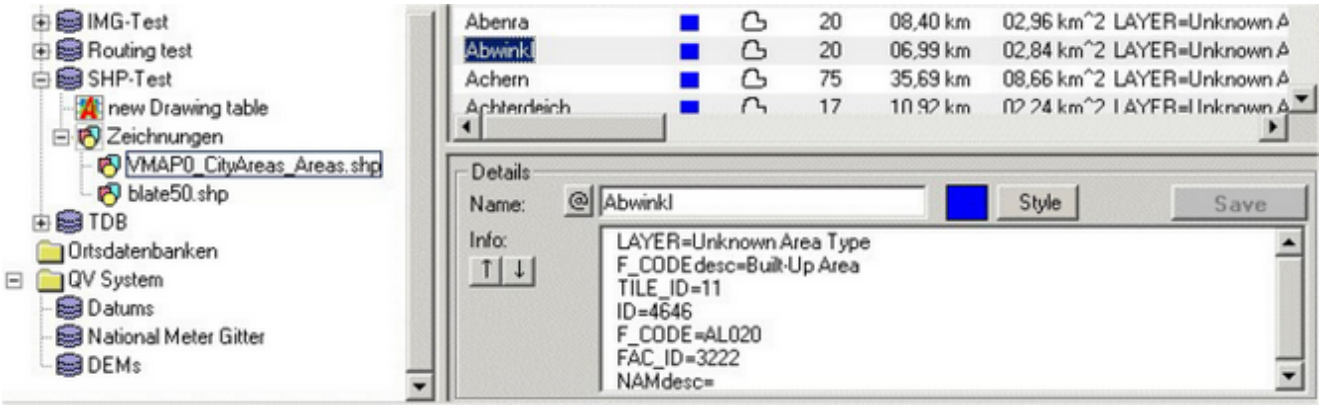
A SHP file can only be edited in QV if it is imported as a drawing.

- Choose a *drawing table* in the *QV X-Plorer* in which the drawing is to be stored.
- Click on the import icon and choose **ESRI shape (shp)** and choose the file to be imported.
- In the following dialog box you have to choose the appropriate coordinate system:



In the upper field the extent of the coordinates as stored in the original SHP file will be listed in the *Data extents* section and the corresponding extent according to your coordinate system definition is listed. In the example given above this is set to Lat/Lon WGS84.

- QV will import the SHP file, convert the coordinates according to your definition and stores all elements as separate drawings.
- If a DBF is identified, the database information will be extracted and listed in the *X-Plorer Detail window*:



Import as a map

Importing the same SHP file as a map has the drawback that the map cannot be modified, however, if this is not required, the performance will be much higher and the map can also be used as an overlay on other raster maps.

- Choose a *map table* in the *QV X-Plorer* in which the map is to be stored and choose **Import new map** from the pop-up menu which you access with a right-click on the map table. You can also drag the SHP-file from the MS Windows Explorer into the map table.
- Now the same dialog box will open as described above in order to specify the coordinate system.
- A second dialog box will follow for defining attributes and styles. You can choose areas for SHP-files containing polygons and line types for SHP-files containing polylines.

Compile multiple SHP-files to a QVM file.

See chapter QVM - Files.

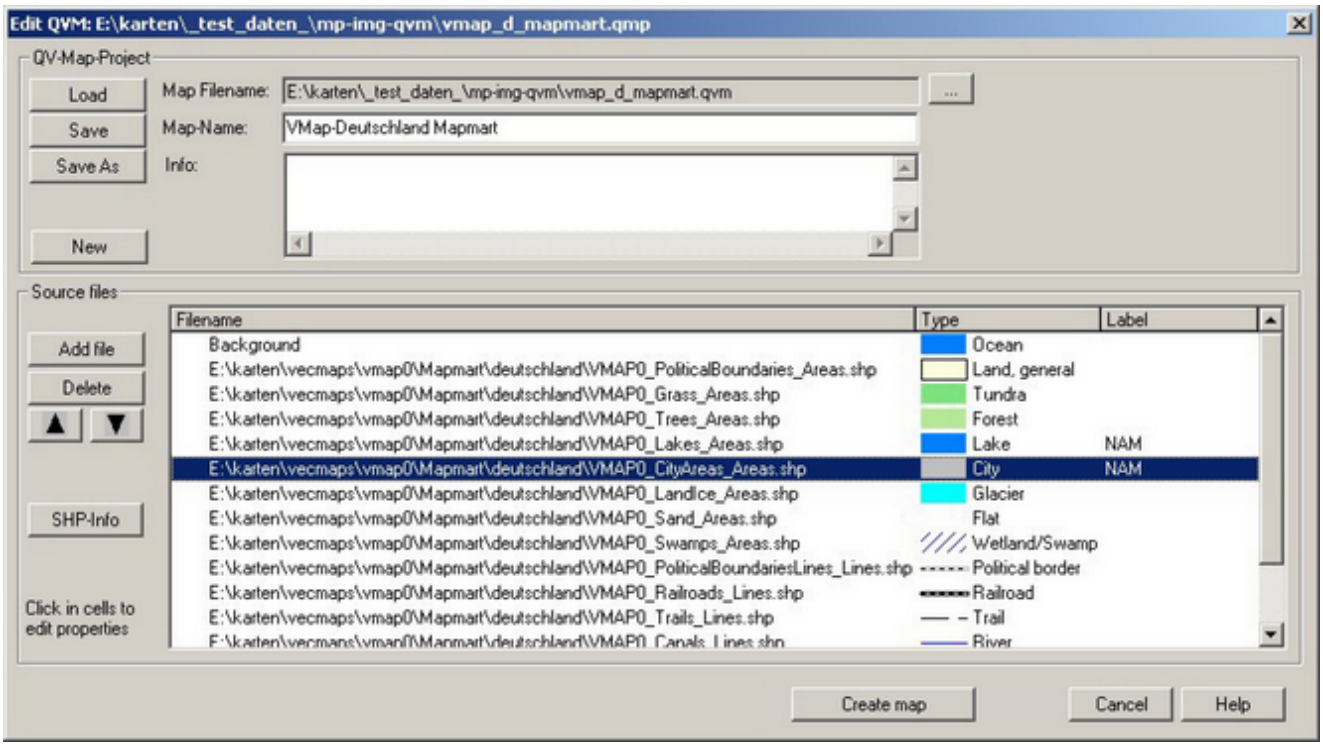
QVM format

QVM is he new *QV* vector format which allows for generating a new map from existing SHP and MP files. The style of each shape file can be attributed separately. For labeling, a database field can be defined.

As usual you start by selecting a map table.
Choose **Create new vector map (QVM)** from the pop-up menu which you access by a right-click on the map table or click the **Import new map** icon.

If you have already created a QVM map, you can also edit this map by a right-click on the map in the *X-Plorer* and selecting **Edit QVM** from the pop-up menu.

In both cases the following window opens:



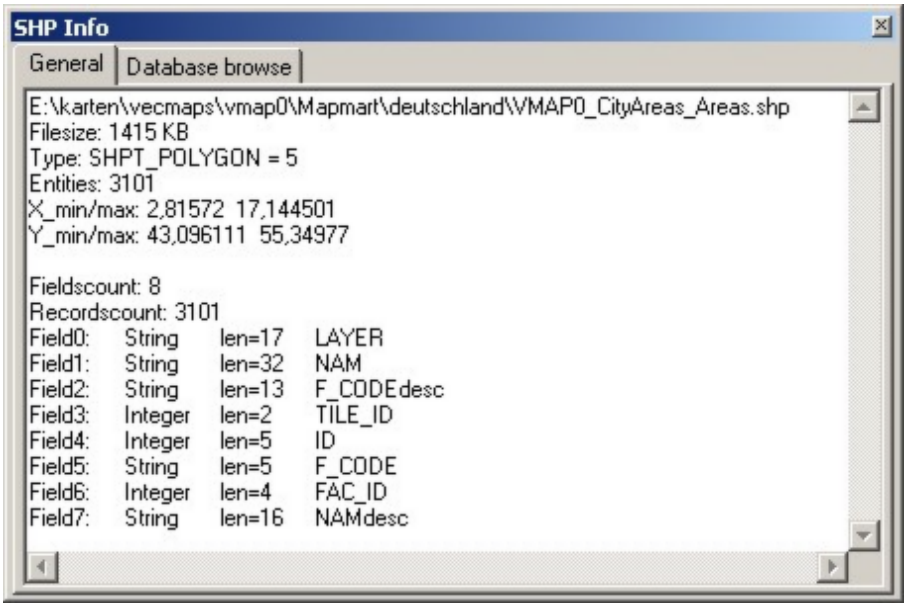
Load **Save** **Save As** **New**	You can save all steps associated with the creation of a QVM map project as a QVP file which you can load later on.
Map Name	This map name will be used as annotation to identify the QVM map.
Info	Here you can enter a user-definable text or comment for the Info field.
Map Filename	Specify the path and file name for the QVM map.

In the source file section you can specify all SHP files for this map project and assign attributes.

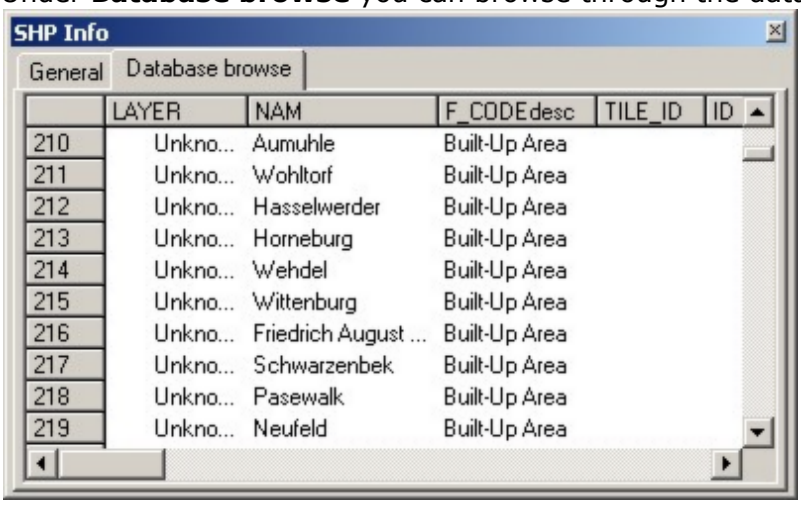
Add file	Choose a SHP file to be added.
Delete	Delete a SHP file from the list.
▲ ▼	Using these buttons you can alter the ranking of the files in the list. The ranking in the list corresponds to the sequence in which the elements are plotted in the map window. So you should arrange points and lines first and areas last. Otherwise areas will mask points and lines in the map plot.

SHP Info Opens a window with infos on the specific SHP file. To archive this, you can also double-click on the file name.

Under **General** all basic information on the type, content and extent of the map is listed as well as the database structure if a DBX file is available:



Under **Database browse** you can browse through the database:



Double-click on a particular line in order to access additional info on a given object.

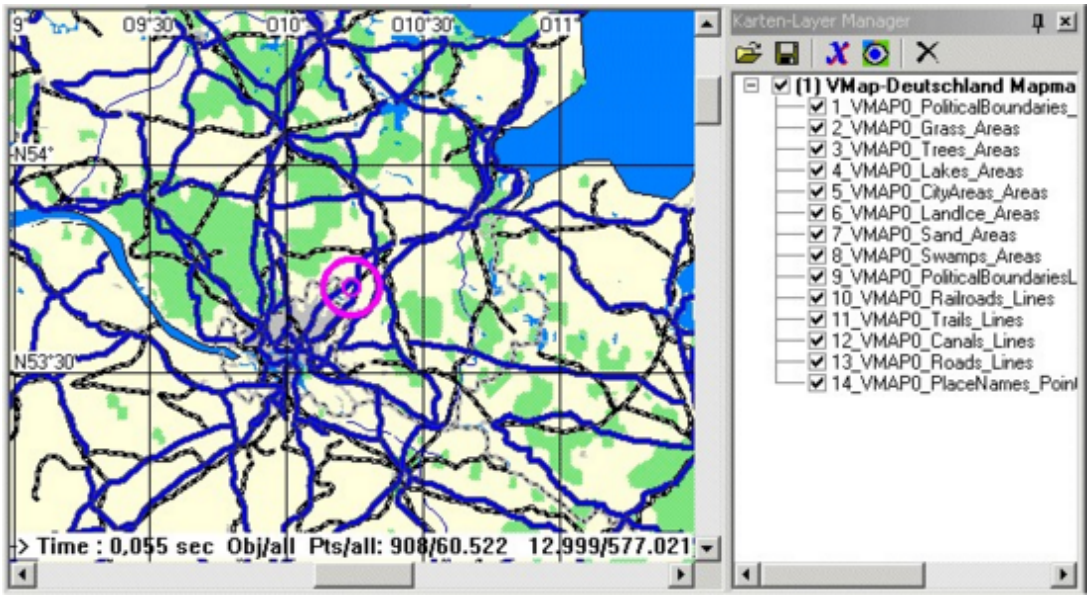
Type Opens the selection box to define a style.

Label Here you can assign a label for annotation in the map plot. Choose a column from the database which will be used for labeling. If you leave this field empty the object will not be labeled in the map plot.

When everything is specified, save the project with the **Save** button and generate the map by pressing **Create Map**.

The compiled map will then be added to the *X-Plorer* map table. As you can see a separate layer is created for each SHP file which can all be individually enabled or disabled for plotting in the map window using the *Layer*

Manager.


9°
09°30'
010°
010°30'
011°
N54°
N53°30'
> Time : 0,055 sec Obj/all Pts/all: 908/60.522 12.999/577.021
Karten-Layer Manager
(1) VMap-Deutschland Mapma
1_VMAP0_PoliticalBoundaries_
2_VMAP0_Grass_Areas
3_VMAP0_Trees_Areas
4_VMAP0_Lakes_Areas
5_VMAP0_CityAreas_Areas
6_VMAP0_LandIce_Areas
7_VMAP0_Sand_Areas
8_VMAP0_Swamps_Areas
9_VMAP0_PoliticalBoundariesL
10_VMAP0_Railroads_Lines
11_VMAP0_Trails_Lines
12_VMAP0_Canals_Lines
13_VMAP0_Roads_Lines
14_VMAP0_PlaceNames_Poinl

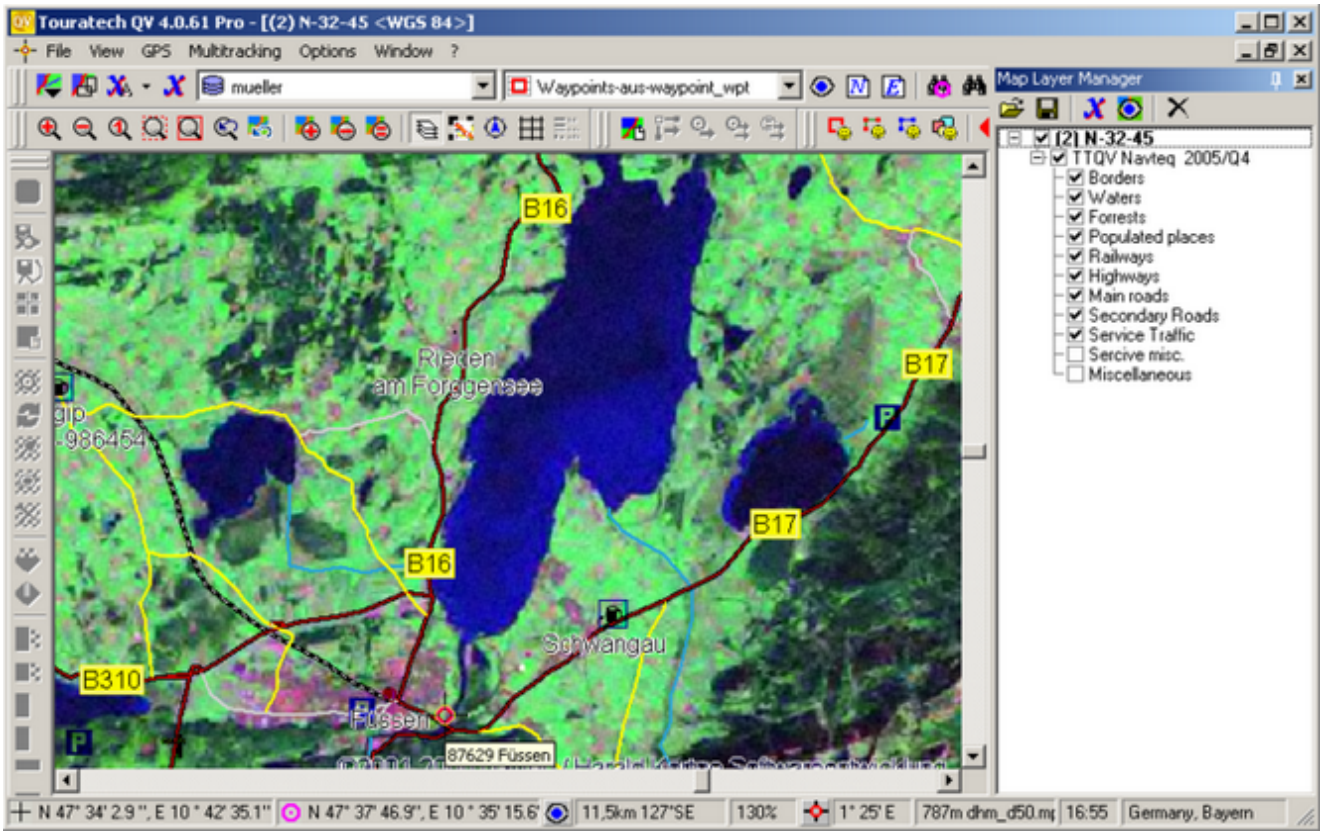
Overlays

All vector maps, which can be open in QV, can also be used as Overlays on other raster maps. These include:

NAVTEQ, SHP, IMG, TDB, QVM. It is possible to overlay multiple vector maps at a time.

The simplest way to achieve this is a drag&drop operation from the *X-Plorer*:

- Open a raster map.
- Choose the vector map to be overlaid in the *X-Plorer*.
- Simply drag the vector map from the *X-Plorer* to the map window.
- Alternatively, you can choose **Show (Overlay)** from the pop-up menu after a right-click on the vector map in the *X-Plorer*.

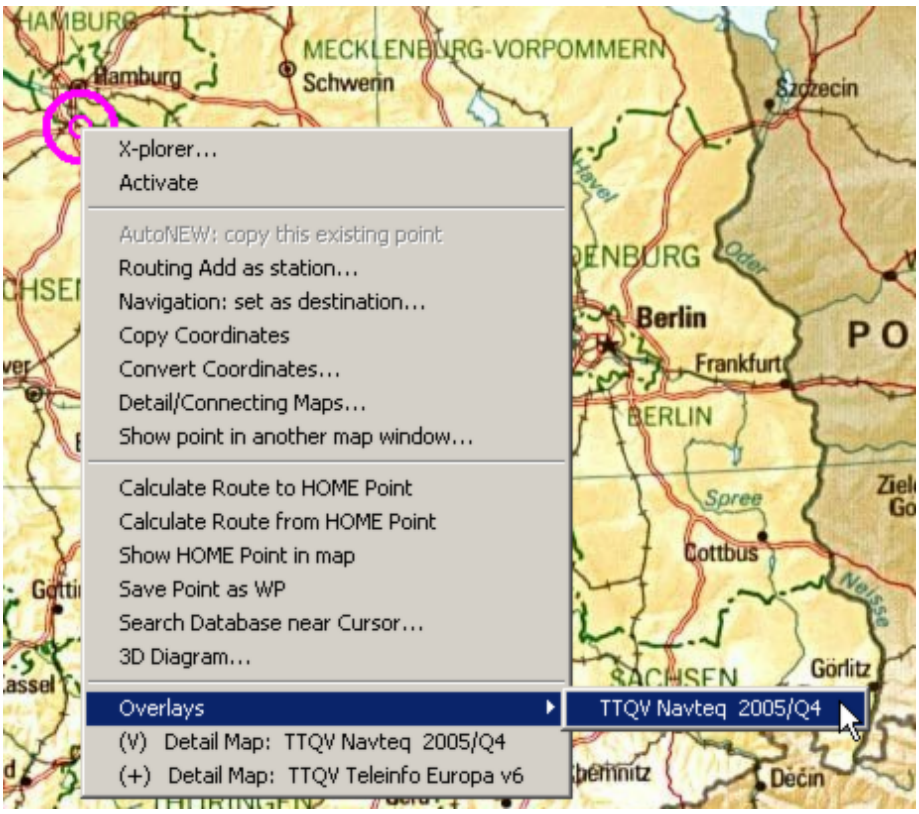


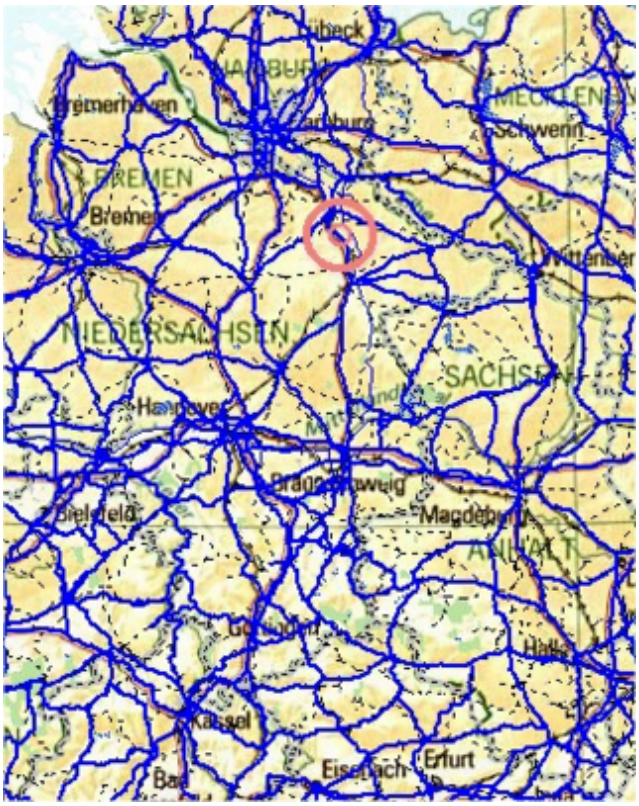
The *Map Layer Manager* will give you full control over the map layout. You can enable or disable all layers individually.

You can also delete the map overlay by marking the vector map in the layer manager and click the ✕ icon.

Find a specific overlay for a given point

Right-click on the map at the point of interest. The map pop-up menu will open:





Under **Overlays** all suitable maps for a vector overlay will be listed. Choose the map of you choice and the vector overlay will be plotted in the map window. Please note that the current AutoMAP settings will affect the available maps which are listed!

Garmin IMG maps

Garmin IMG maps

The IMG format is an original Garmin format and is used by the Garmin MapSource software to transfer maps into the GPSMAP plotters. Garmin and MapSource are registered trademarks of the Garmin Corp.

QV 4 can now both, read and write this format – e.g. many MapSource compatible maps that do not require unlocking. *QV* can also transfer them directly via USB or a serial port into all Garmin GPS units which feature a map-plotter function.

QV can only upload maps to the Garmin units which are not protected by unlock keys. This function is intended for processing the huge range of free Garmin maps and to facilitate the drawing of your own maps for your Garmin map-plotter.

Reading Garmin maps into QV as maps

Apart from the familiar MapSource products there is now a large number of free maps for Garmin units available which have been created by committed users.

A good starting point is http://home.wtal.de/noegs/freemaps.htm and http://mapcenter.cgpsmapper.com/catalogue.php

There are two types of files:

- individual IMG files
- TDB files

An individual IMG file may be a single map or a tile from a larger map consisting of many tiles. In this case there is always a TDB file which merges all the IMG files.

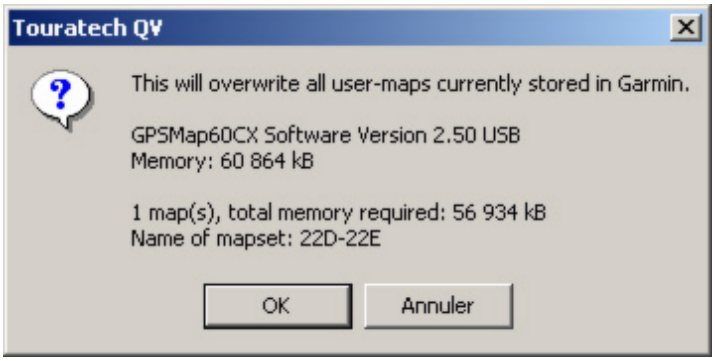
QV can import both, IMG and TDB files as maps. However, if there is a TDB file available this should be the one to be imported because a separate import of all individual IMG's is then obsolete.

Therefore, to import IMG or TDB files into *QV* 4, just use the normal functions for map import. Select an IMG or TDB from **Import new map** in the *X-Plorer* or **CD-Import** in order to import a whole folder.

Loading Garmin maps from the X-Plorer into the Garmin GPS unit

A new button has been added to the *X-Plorer* toolbar for this function:
First of all, the Garmin should be connected to the PC and switched on. The correct port must be selected under **Options – Settings - GPS**.

Simply select the required IMG or TDB maps in the *X-Plorer*, and click on the icon. You can also select several files or even a whole table. With multiple selection, e.g. a whole table or database, other map types may also be included. However, they will be ignored and not uploaded.
The GPS will then be checked for enough memory available and the following message will appear:



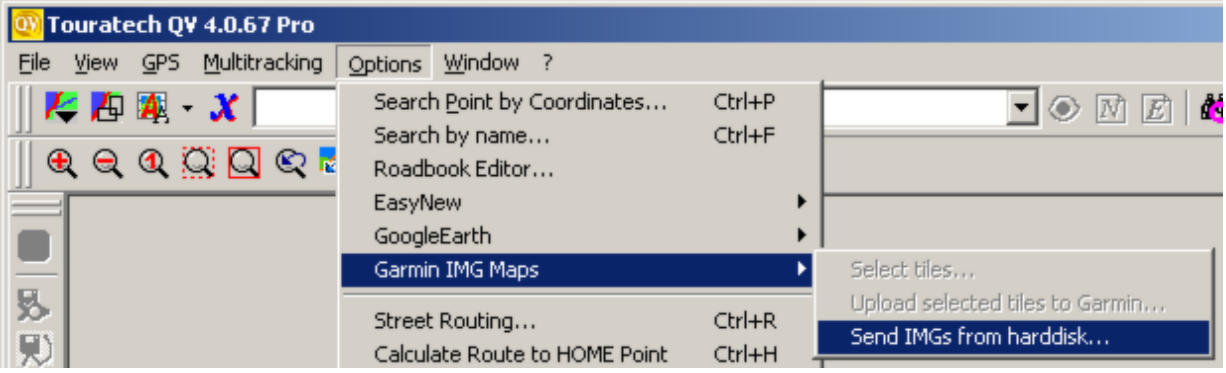
Garmin units can only load one set of maps at a time. This means that each loading procedure will first of all delete the whole memory (except for the internal base map).

As with the loading of normal GPS data, the transfer parameters are also set under Settings - GPS. You can send the map through a serial port with various baud rates or via USB (only when the Garmin unit has a USB port). Older Garmin units without USB interface often do not support the high baud rate (115200 b/s). If you encounter any problems just set the baud rate a little lower.

Loading Garmin maps from the hard disk to the GPS unit

You can also load maps into your GPS that have not already been imported to *QV* 4.

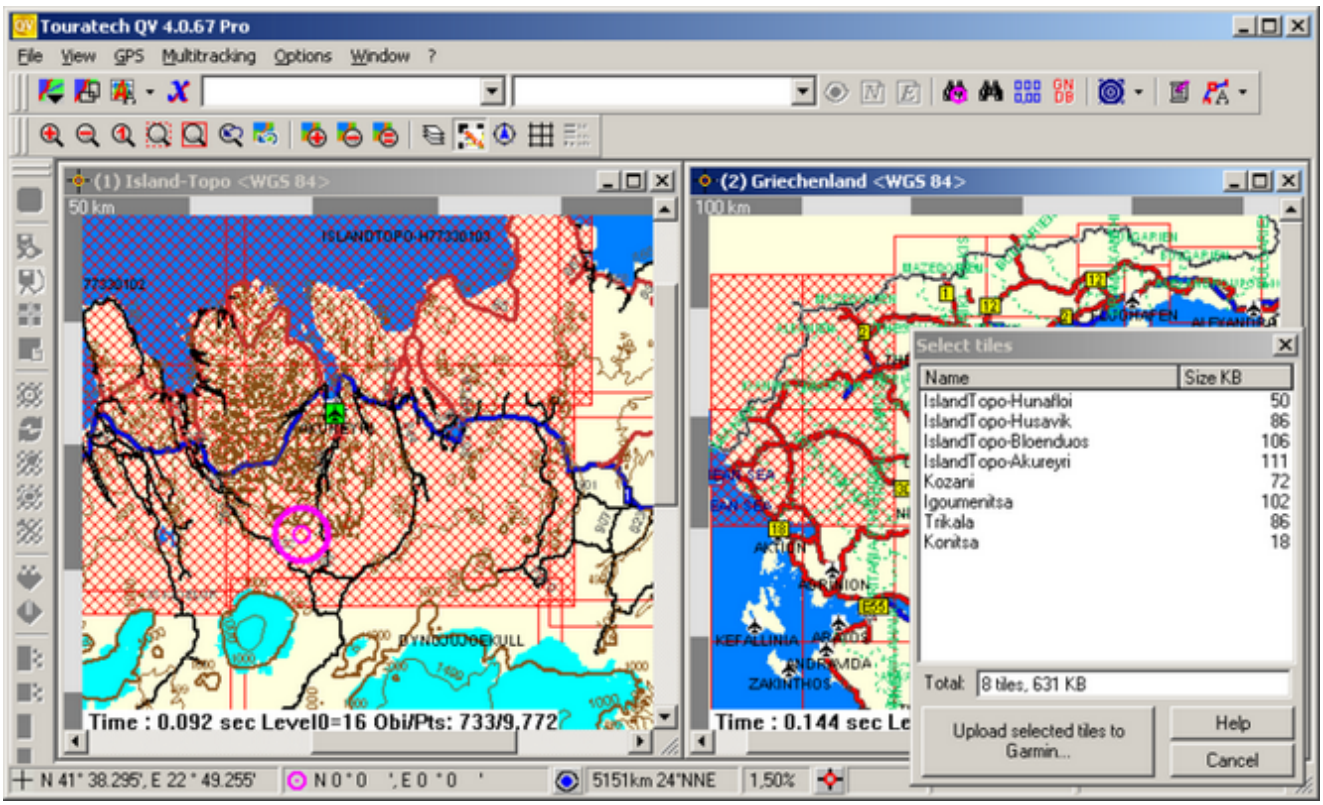
To do this simply choose **Send IMGs from hard disk** from the **Options - Garmin IMG** menu:



Then select one or more TDB or IMG files and click **OK**. You then continue as described above under *Loading Garmin maps from QV into the GPS unit*.

Loading individual TDB tiles into the GPS unit

If you wish to send parts of a map you can select individual tiles from the map and then send the selected tiles only.



- Open all maps from which you want to send tiles.
- Choose **Select tiles** from the **Options - Garmin IMG** menu:
- Mark the tile(s) you want to send with a left-click of the mouse. A selected tile is shaded in red. Clicking again cancels the selection.
- When your selection is finished choose **Upload selected tiles to Garmin**. Then continue as described above under *Loading Garmin maps from QV into the GPS unit*.

Creating your own Garmin maps

With *Touratech QV* 4 you can now upload tracks, waypoints and drawings into the Garmin unit as maps.

In order to specify how specific elements should be displayed in Garmin GPSMAP plotters, style settings must be allocated to all elements. This is done uniformly for all elements in a new tab in the *Markings dialogue box*.

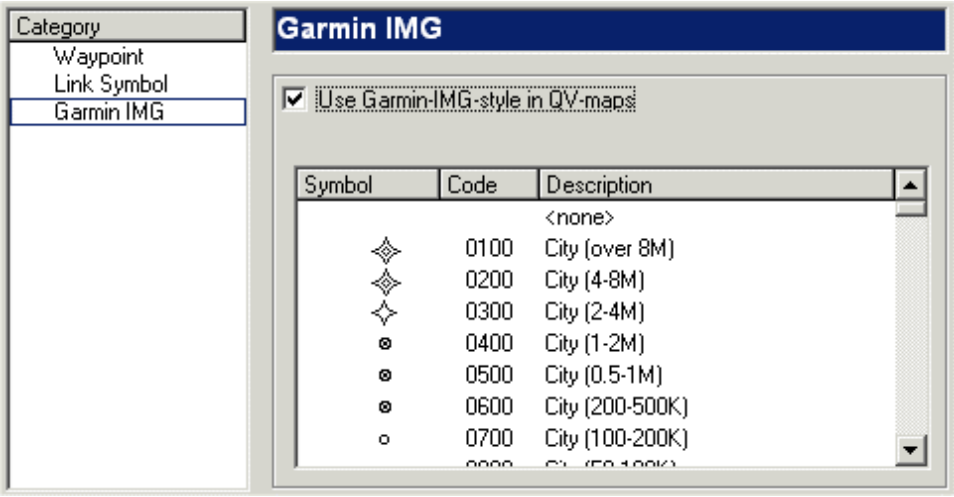
So open the *Markings dialogue box*, e.g. with **Style** from the *X-Plorer* or by choosing **Style** from the pop-up menu after a right-click on the element on the map.

Then select **Garmin IMG** and then the object type you want the object to be displayed in the Garmin.

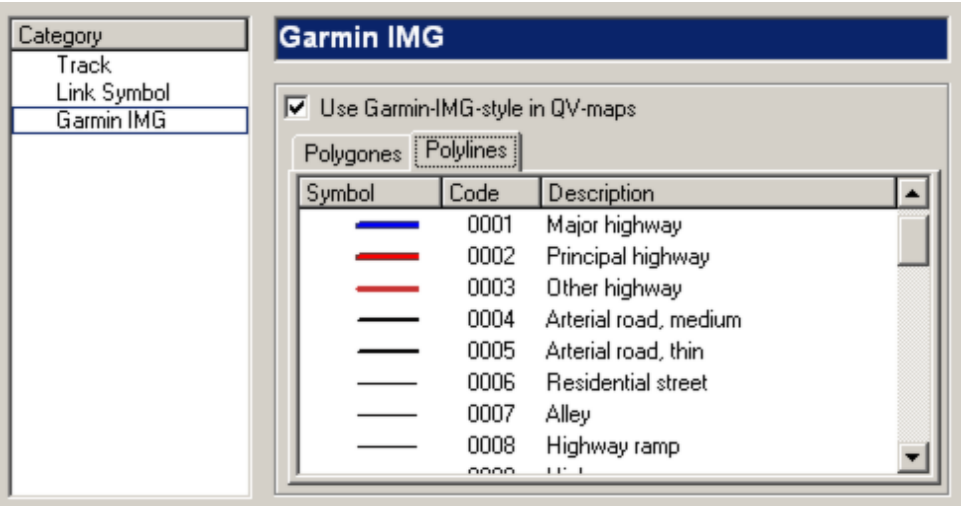
Three object types are available for Garmin GPS units:

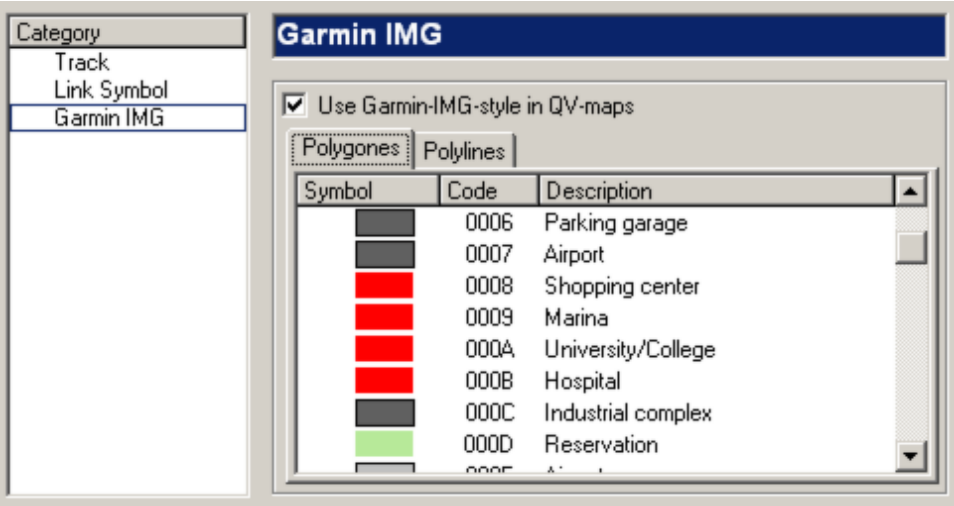
- POI's (Points Of Interest); like waypoints these are simply points with assigned names
- Polylines; lines such as tracks, e.g. roads, rivers, contour lines, etc.
- Polygons; areas such as woods, lakes, etc.

A waypoint in *QV* can only become a POI in the Garmin unit.



A track or a drawing element can become a line or an area.



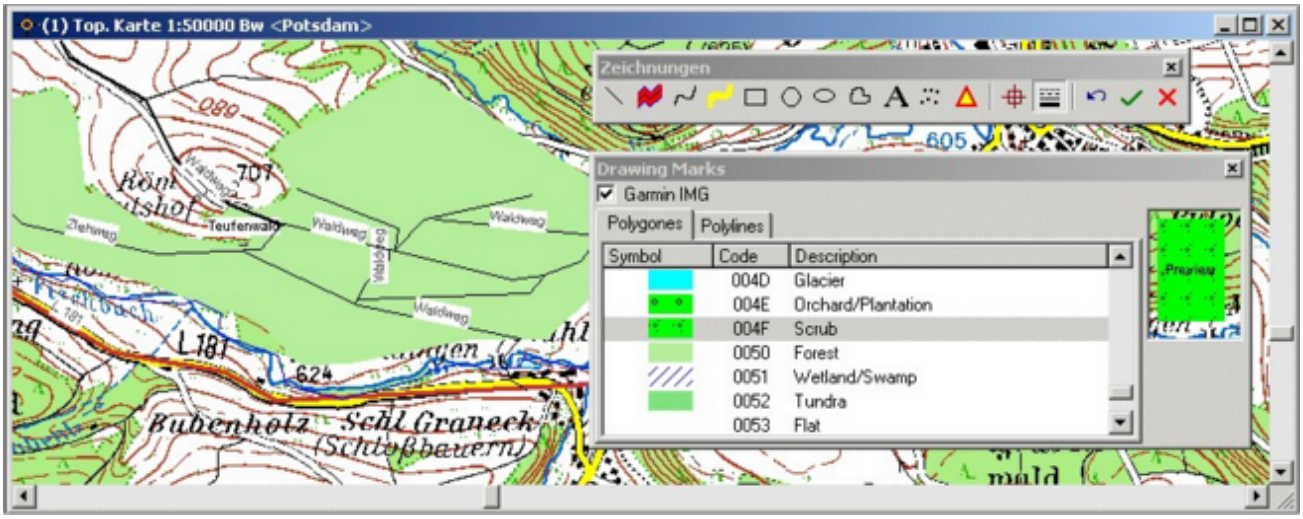


You can also enable the button **Garmin IMG style in QV maps**. Then the elements will be displayed in the *QV* map window in the same way as it will appear in the Garmin unit.

Drawing your own Garmin maps

In order to make drawing easier, the Garmin style selection is incorporated into the drawing style

toolbox .
Thus, if you create a new drawing you can switch with **Garmin-IMG** to the Garmin toolbox:



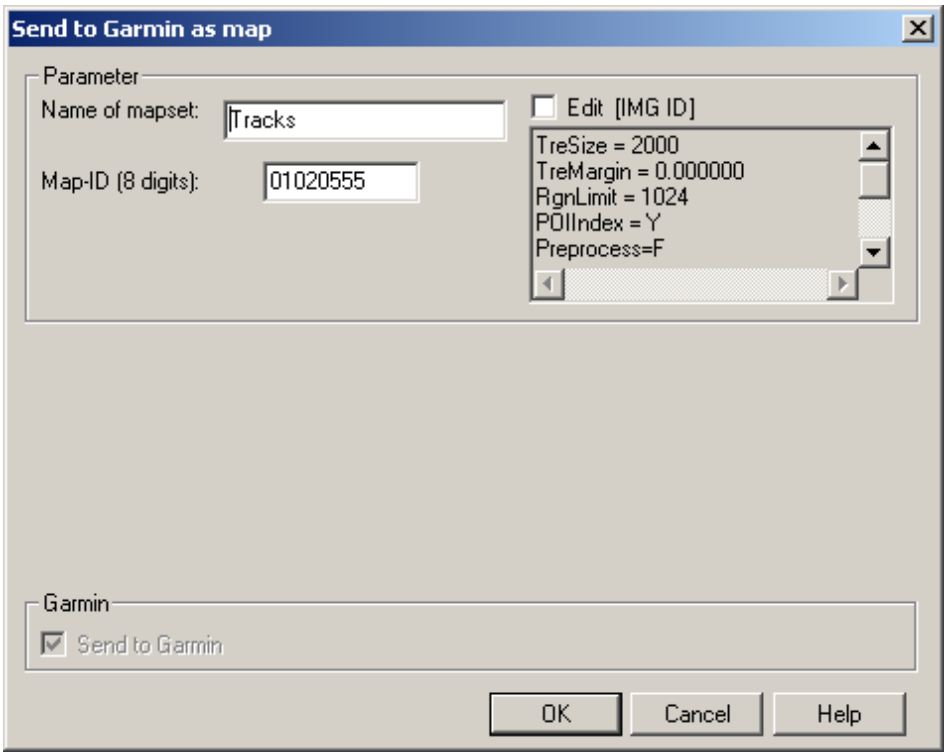
You can also assign a Garmin IMG style to your own tracks and upload them.
In other words:

The settings in the *X-Plorer* determines how the elements will appear in the Garmin later on. You can create a database with track tables and drawings and then upload the whole database. Your imagination has no limits.

Uploading your own maps to the Garmin unit

The procedure is almost completely identical to the standard procedure for uploading tracks, routes and waypoints.

Simply select the data that is to be uploaded to the GPS unit in the *X-Plorer* and click on the icon:



In the next dialog box you must specify a name under which the map will be listed under

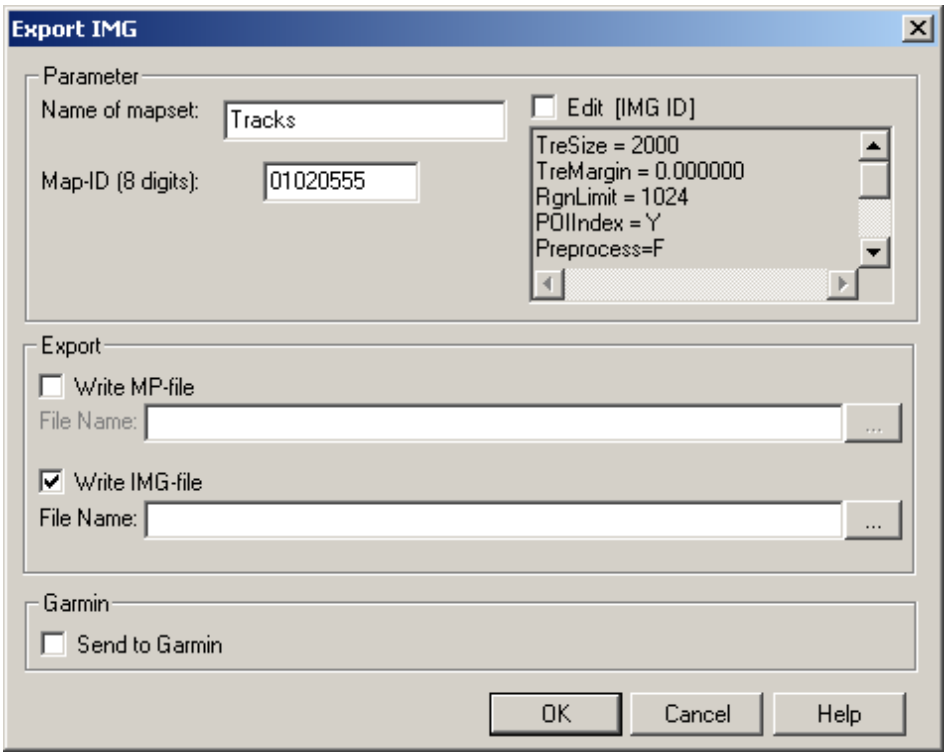
MapSource info in the GPS. You must also enter a user-specified 8 digit ID number.
After clicking **OK** the upload to the Garmin unit starts. As with uploading IMG's (see above), the amount of free memory is checked and you will have to confirmation the upload.

Exporting your own maps

You can also export your drawings as IMG or MP files in order to further process them in other programs or to forward them to other persons.

To do this just select the data to be exported in the *X-Plorer* and then select either **Garmin IMG** or **Polish Format MP**.
The IMG format is the binary format used by Garmin.

The so-called Polish format MP is an ASCII format for further processing the data easily in other programs.



As with sending, please enter the map's name and ID.
You can export IMG and MP files and upload the map to the GPS unit at the same time.

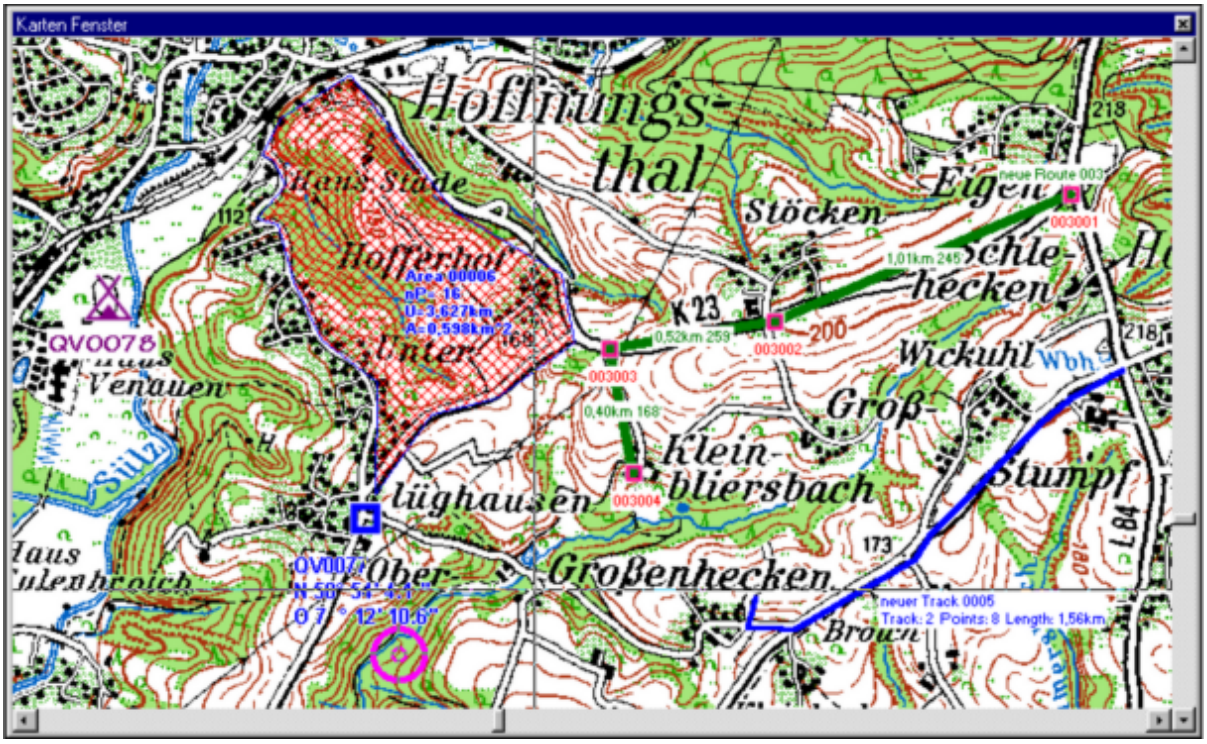
The **Edit [IMG ID]** field is for specialists only.
If enabled, all parameters in the **[IMG ID]** section can be changed or other parameters be added. You will find a precise description of all parameters in the documentation for the *GPSmapper* under: http://gps.chrisb.org/en/manual.htm.

Markings

Marks

In *QV*, all waypoints, routes, tracks and drawings in a map are summarized as **Marks**.

In other words, a marking is the map symbol for a specific element in the database.



In order to plot specific markings in the map you have to select them in the *X-Plorer* and click the icon. See also chapter *Visualizing data in a map*.

The Look of a mark can be modified according to your needs. There are two options: Either in the detail window of the *X-Plorer* by clicking the **Style** button or after a right mouse-click on the mark in the map window and choosing **Style** from the pop-up menu.

See also the Style chapter.

Labeling of markings

Each mark can be labeled wit a text string. Thus, waypoints, routes and tracks can be named. Using the **Style** option from the pop-up menu you can specify colour, textstyle and textsize as you like.

Furthermore you can specify if you want to restrict the labeling to the object's name or if you wish to add annotations such as a description or the coordinates of a waypoint.

In order to avoid masking of important map details, you can move the text label to another place by a drag-and-drop operation with the mouse with the left mouse button.

All style settings will be saved in the database.

AutoNEW - Creating markings
Creating and modifying of waypoints, routes and tracks

In the following you'll find the main functions to create or edit waypoints, routes, tracks or drawings.

AutoNEW:

N creates a new object (waypoint, route, track, drawing).

E edits the object, i.e. creates or edits a new point in the map.

Deciding what is to be created and where it is to be saved

Whenever you create new data, you must specify first where this is to be saved. You can do this by simply clicking on a table in the *X-Plorer*. The table must be suitable for the type of new data.

There is no different with the *AutoNEW* function. When you want to create new waypoints, click on the waypoint table in the *X-Plorer* in which you want the new points to be saved. The same applies if you want to create routes or tracks.

Alternatively, you can select the required database and table from the selection boxes in the main window symbol bar, which work completely synchronous to the *X-Plorer*:

Select the database

Select a table to which the new object is to be saved. For creating a new route, select a route table before, for creating waypoint, select a waypoint table, and so on. Then click on the *AutoNEW* **N** button and enter the name of the new route. The route is now created and *QV* will automatically change to the Edit mode **E**.

In order to change an existing route, select a route and click on Edit **E**.

Activating AutoNEW and entering names

Click on *AutoNEW* N in the symbol bar and the symbol will be highlighted (pushed button).
You can also select ***AutoNEW*** from the pull-down menu **Options** or press **Ctrl N**.

Waypoints — Enter the prefix for the waypoint names. A maximum of nine characters is allowed. The waypoint name will then be generated from the prefix and a consecutive number.

Routes

First, you can enter a name for the route. The suggested default is "New route 00x".

Then, please enter the prefix for the route waypoints with a maximum of 3 characters. This prefix will be saved together with the route and will also be used for later amendments to the route. The name of the route waypoints will be generated from this prefix and the position of the WP within the route.

If you activate the **Street Routing** function, *QV* will automatically calculate a route and update this route with every new route point which is added. For this function the Navteq vector map must be installed in *QV*, see chapter Street Routing.

If you activate **Altitude Profile**, *QV* will automatically generate an altitude profile of the route and will update the plot with every new route point which is added. For this function it is essential that you have installed elevation data in *QV*, see DEMs and XY-Diagram.

Tracks

Enter the name of the new track. The suggested default is "New track 00x".

If you activate **Altitude Profile**, *QV* will automatically generate an altitude profile of the track and will update the plot with every new trackpoint which is added. For this function it is essential that you have installed elevation data in *QV*, see DEMs and XY-Diagram.

Drawings

The toolbar **Drawings** will open, see chapter Drawings.

Now the new object is created and QV will change to the Edit mode in which you can add new points in the map window.

Editing in the map window

In this mode you can create new route / trackpoints and waypoints or you can move existing points. You can also add points to a route or track line. As long as you are in the Edit mode the symbol will be highlighted.

The shape of the mouse pointer will indicate which function will be executed with the next mouse click:

Add new points:

With each mouse click a new point (waypoint, route or trackpoint) will be saved. The new point will be added at the end of a route or track line.

When moving the mouse you'll see a rubber band line which is connected to the point created last.

As long as the rubber band line is visible, only points can be added. In order to add points within a line or shift points, press the **ESC** key and the rubber band line function will be disabled.

Add point to line:

The mouse pointer will switch to this symbol when you are moving the mouse over a route or track line.

With the next mouse click you are creating a new point which will stick to the mouse pointer and can be moved to the desired position. With a second mouse click the point will be set to its final position.

Moving a point:

The mouse pointer will switch to this symbol when you are moving the mouse over an existing waypoint, route or trackpoint.

With the next mouse click the point will be sticked to the mouse pointer and can be moved to a new position. With a second mouse click the point will be set to its final position.

You can also delete points: Either with the Backspace key on the keyboard which deletes the point added last or by the command **Delete** from the pop-up menu of the point to be deleted.

The rubber band line

The rubber band line connects the mouse pointer with the last point. Thus, it is possible to see exactly the position of the new point. In addition, a yellow tooltip box shows the distance and heading to the last point. So it is easy to relate the new point to the last one.

If you want to place the new point as accurate as possible, press the **<** key on the keyboard. Now a text box opens and you can define the new point by numbers:

Distance and course	Enter the distance and course and separate them by the < sign: e.g. 1.5<90 creates a new point in 1.5 km distance to the East
Coordinate	Just enter the latitude and longitude of the desired position
Distance X;Y	Enter the distance in direction X and Y, separated by a semicolon (;) e.g. 1000;500 creates a new point 1000 m to the East and 500 m to the North (in case you have set the coordinate system to UTM or Meter grid)

Note that all distances refer to the units currently set, see **Options - Settings** in the main menu.

Press **Enter** to confirm and **ESC** to cancel the input.

As long as the rubber band line is visible, you can set a new point by a left mouse button click only. Then a new rubber band line appears. Alternatively you can enter the data of the new point numerically in an input box which you can access through the **<** key.
As long as the rubber band line function is active it is not possible to mark, edit, delete or copy existing points or lines or to open pop-up menus with the right mouse button.
For this purpose, you have to close the rubber band line function first by pressing the **ESC** key.

Creating new points by copying existing elements

In some cases you may wish to create new routes from existing waypoints or generate a route by copying several points from existing tracks.

For individual points this can be done with the command **AutoNEW: Add this point** from the pop-up menu of the corresponding point. Don't forget to terminate the rubber band line function by pressing the **ESC** key before.

However, if you wish to do this with a couple of points it is better to activate the function **Snap to Existing Points** from the **Options** menu or by pressing **Ctrl-S** or by clicking the icon in the drawings toolbox. Then the rubber band line will snap to a specific point when you approach it closely. The same is true for lines.

You can enable and disable this mode simply by turning it on or off.

Drawing in several map windows

If you are planning a long route, it may be helpful to open a second map window with an overview map. In the edit mode all changes done will automatically be plotted also in the other map window, provided that this object is also viewed in this map window.

You can even change between the windows as you like, e.g. create a point in the overview map window and place it accurately to the desired position in the map detail window.

If you are searching a specific point in another map window, you can proceed as follows:

- Right-click on the corresponding point in the first map window and select **Show point in another window** from the pop-up menu.
- A second pop-up menu will open where you can either select one of the existing map windows or open a new map window.
- If you created a waypoint, route or trackpoint in the first window, the entire object will be displayed in the other window. If the route / track is already displayed in the other window, the map will automatically be shifted to the point created last.

EasyNEW - Creating new markings quickly

The EasyNew function summarizes already existing commands for a quick and easy access to most important functions.

For this purpose, a separate toolbar and the new menu point **Options-EasyNew** have been created.

Create new waypoints, routes, tracks or drawings

With these buttons you can quickly create new waypoints, routes, tracks or drawings on a map.

Please note that a map has to be opened before.

In contrast to the *AutoNEW* function, there is no need to determine the path to the database first. *EasyNEW* automatically saves all objects in the database **My Data**.

Download of GPS data

With this button you can quickly connect QV with your GPS. But the GPS has to be connected and switched on before. Then all WPs, routes and tracks will be downloaded automatically.

Import new Map

Imports a new map, e.g. a scanned map, and opens the calibration window.

Import/Open a new map automatically from your disk drive

QV will checked whether there is a CD / DVD inserted in your CD/DVD drive.

If there are maps available calibrated for *QV*, these maps will be automatically imported into a new map table.

If this CD/DVD has already been imported earlier, its content will be shown and you can open a map from the list.

Unlike the usual *QV* procedure where you first have to specify the path to the database in the *X-Plorer*, the EasyNew function automatically saves the new elements in the current database and table.

For waypoints, routes, tracks, drawings and new maps it is the database My Data.

New CD/DVDs will automatically be saved in the database **CDROM Maps**.

For GPS data, a database named **GPS_Download_date** will be created.

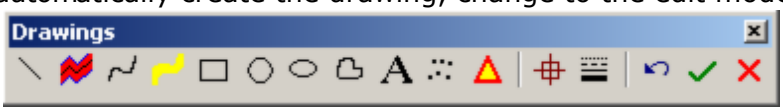
Drawings

QV allows for an annotation of additional information on the map. For this purpose the drawing function *line*, *freehand line*, *text marker*, *rectangle*, *circle*, *ellipse*, *area* and *text* are available.

You can select any color and line width. Rectangles, circles, ellipses and areas can be shaded. Text can be created in any font and size.

Additional information such as line length, area size and circumference of objects are automatically calculated and stored.

Create a new drawing

- First of all, select the drawing table where the drawing is to be saved.
- Then start the AutoNEW function by clicking the icon and enter the name for the new drawing.
- QV will automatically create the drawing, change to the edit mode and open the *Drawings* toolbar: 

- You can now select the desired tool and draw as usual.

Editing an existing drawing

For this purpose, just click on one of the drawing elements in the map and select *Edit* from the pop-up menu. Or select the drawing in the *X-plorer* and click on .

Selecting a drawing function

For drawing, select one of the following functions from the drawing bar:

Line	Creates a polyline, i.e. a line connecting any number of points. Any left mouse click sets a new point along the line (vertex).
Corridor	Just select an existing track or route by marking it with a left mouse-click and enter a width. *QV* will then create a corridor (area) along the polyline. The corridor will be added to and stored in your drawing table as a separate element.
Polyline	Draws on the map according to your mouse movement. Click on the starting point and keep the mouse button down while you move the mouse and thus draw the line. Releasing the mouse button sets the endpoint of the line. However, the function is still active. If you click-and-hold the left mouse button and move around, another line will be drawn.
Thick polyline with text marker effect	Similar to polyline but with a thick transparent marker. Ideal for highlighting a planned trip when creating a route is not needed.
Rectangle	Draws a rectangle. Click on the first corner, place the pointer diagonally at the opposite corner and click a second time.
Circle	Draws a circle. Click on the center and then zoom to the desired radius.
Ellipse	Draws an ellipse. Click on the center and then zoom to the two radii.

Area		Draws a closed freeform area. Click on the corner points of the area, one after the other, just as with the line function or fallow narrow contours with the mouse button held down, just as with the polyline function.
Text		Creates a text. Click on the map where you want the text to start. An entry box and a flashing cursor will appear. Enter the text and press the Esc key when you have finished. There can be several lines of text. Press the Enter key to start a new line. Once saved, the text can be changed later on at any time in the info field of the *X-Plorer* detail window.
Points		Creates single points with a mouse click.
User Symbols		Opens the toolbar *User symbols*. Here you can insert your own symbols into the map.
Snap		This button can be turned on and off. If it's enabled while one of the drawing functions is active, the mouse caches existing points nearby which might originate from other drawings, waypoints or trackpoints. Using this function, you can duplicate existing points in drawings at the exact position.
Style		Enables or disables the tools for color selection, fill, line-type or text style that can be used to specify the appearance of the drawings beforehand.
Undo	**Z**	Deletes the last point of the active drawing command if you have clicked the wrong one. Alternatively, you can also press *Z* or *Backspace* on the keyboard.
Enter		Closes the active drawing command and saves the new object in the database. Use this symbol in order to enter a line, polyline, text marker or area.
Close	**X**	Cancels the edited drawing element without saving. Alternatively, you can also press **Esc** on the keyboard.

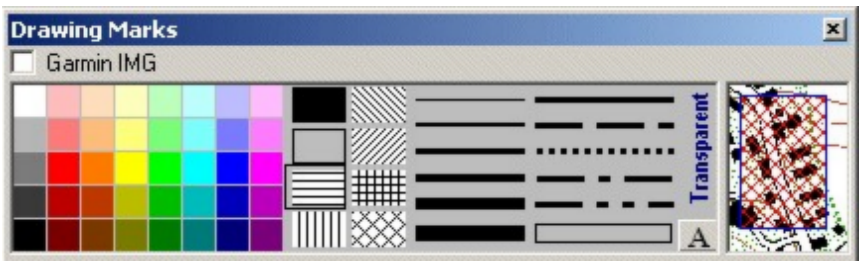
Automatically reducing the number of points

When closing one of the line, polyline, text marker or area functions, *QV* automatically reduces the number of points entered according to specific criteria so that the database is not overloaded unnecessarily.

This works in the same way as reducing trackpoints, the parameters are currently entered under *Options - Settings - General - Drawings*. See also chapter "Reducing trackpoints".

Color and shading

If you click on the icon, the color selection box will open. Clicking it once again makes the selection box disappear. This box can be opened and used at any time even when a drawing command is operative.

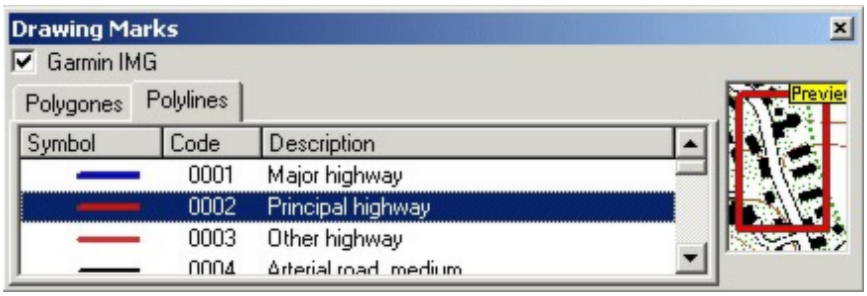


Color	Left click on one of the 40 color fields to set the line or text color.
	Right clicking selects the color of the shading or fill.
Shading	Select one of the 6 line hatches or shading types or disable shading.
Line width	There are six line widths available for lines and frames. Line hatches are always drawn with a thin line.
Line style	Besides solid lines there are also various other line types available: broken lines, dotted lines, dashes lines and axes. The selection on the lower right side represents "no line" which is useful for areas where you only want shading and no frame.
Text marker	This is a switch function to select if lines and fills should appear transparent or opaque.
A	Opens a dialog window to select the font type and size for the text and the labeling of the drawing elements.
Preview	In the field on the far right, you can see a small preview visualizing the selected style options.

The settings made here apply to the current and all following drawing elements until you select another setting. Drawings once created can be altered with the *Style* option of the pop-up menu (right-click with the mouse on the element on the map) or in the *X-Plorer* detail window (*Style* button).

Drawing of Garmin maps

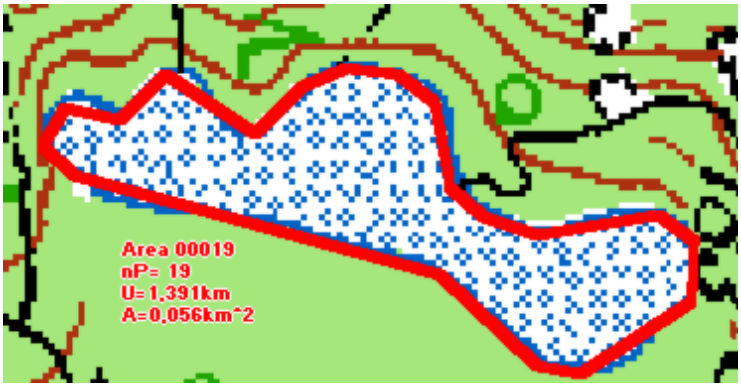
You can prepare your drawing for a later update to your GARMIN GPSMAP plotter while editing the drawing. For this purpose you should assign to each drawing element the information on how this element should be plotted in your Garmin unit. Just switch the color selection box to **Garmin-IMG** and choose from the list of types:



You find further information on how to draw Garmin-compatible maps in the chapter Garmin-IMG.

Labels and additional information

Besides labeling of the drawing elements, *QV* will also calculates circumference and area for areas, circles, ellipses and rectangles, and the length for lines and polylines, respectively.



In the illustration shown above, the borderline of the lake has been encirded and thus the area was calculated to be 0.056 km² and the circumference 1.39 km. *nP* is the number of points along the polyline which defines the area, here 19.

The name of the drawing object is automatically generated from the object type and a consecutive number, here *Area00019*, and can be changed in the *X-Plorer*.

This additional information can also be changed in the *X-Plorer*. They can be found in the **Info** field of the drawing element.

As with all marks, the labelling of the drawing elements can be moved with the mouse (drag-and-drop) so that important map details are not hidden by the text.

Important Note: Areas, circumferences and lengths are calculated with the unit setting which was selected when creating these elements. Subsequent changes to another unit setting will not change the text string! However they will affect the values for the calculated areas, circumferences and lengths in the list window of the *QV X-Plorer*.

User-defined symbols

You can create your own symbols and display them on the map. Just create and save your symbols as BMP file with a maximum size of 128 x 128 pixels in the directory of your choice.

Then click on the icon to open the toolbar *User Symbols*. By default, the box will be empty, except the icon. Click on this symbol and select the directory where your symbols are stored. *QV* will then import all bitmaps and visualize them with an icon in this toolbox. You can now just select it and place it as a symbol on your map.

Note: A white symbol color (RGB 255,255,255) will be displayed transparently on the map.

Plotting of drawings on the map

By default, drawings are plotted in total on the map.

However, under **Options-Settings-General** you will find a switch named **Show drawings completely**. If this function is disabled, only the marked drawing elements will be plotted. Otherwise the entire drawing will be plotted even if only specific elements have been chosen.

Style

Here, you can define the appearance of waypoint, route, position and track marks.

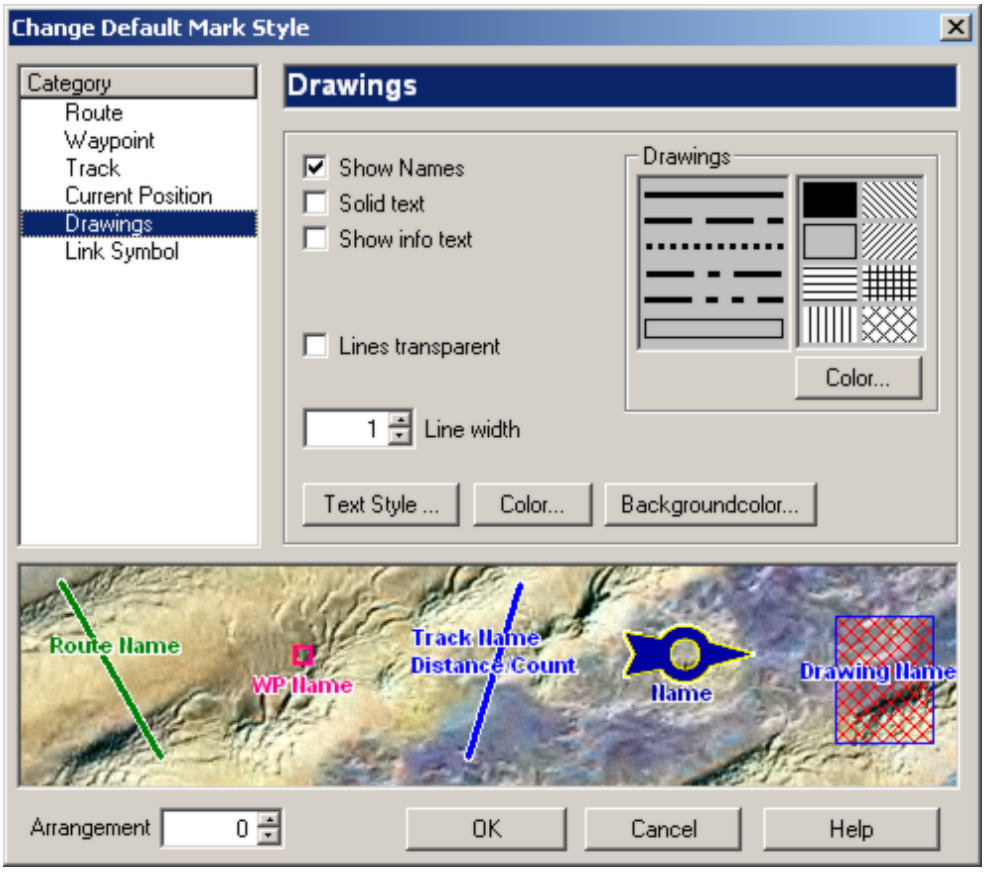
You will see a small map plot and a waypoint, route, track and position marking as a preview. Each change in the settings is immediately updated and confirmed by pressing **Ok** or rejected if you press **Cancel**.

The settings that you make here will be saved permanently in the database. Each marking can therefore have other settings.

When printing, all markings will be printed according to the defined settings.

The window title will indicate to which marking type the defined settings will apply.

If you call up this window from the pull-down menu **Options - Marks**, you define the settings for all NEW markings. On the left part of the window you specify the type of marking and on the right you define the corresponding settings.



If you want to change the settings for a SPECIFIC mark, you have to access the pop-up menu of a marking with a right-click in the map window or in the *X-Plorer* detail window. The options will be the same but the settings will not apply to new markings.

Settings for all Types

Show Names Labels the name of object in the map display.

Solid text

If enabled, the text will be plotted in a box filled with the background color, so that the text is clearly readable.

If not selected, the text will be plotted in the chosen text color. For increased visibility the letters have a shaded margin in the background color.

Text Style...

Opens a dialog box for the selection of font, size and further text attributes.

Color ....

Opens a dialog box for the selection of the text and mark color.

Backgroundcolor....

Opens a dialog box for the selection of background color which will also be used for shaded text.

Plotting order

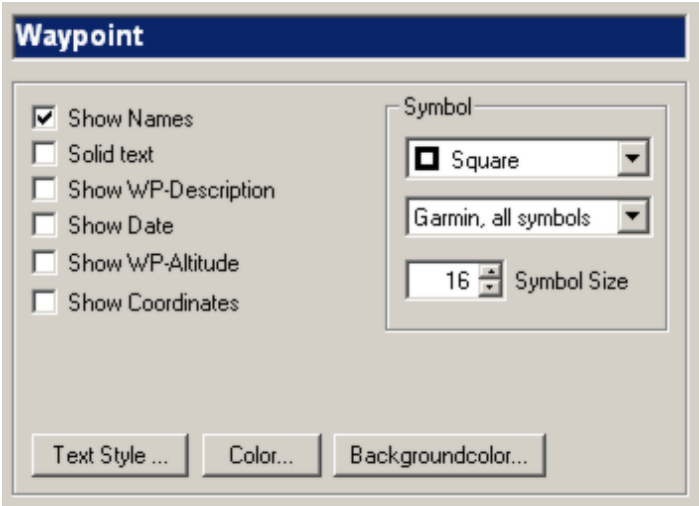
Specifies the plotting order of this marking type in relation to other types of markings.

"0" will result in the same plotting order as the marks have been created and as arranged in the map with the *Plotting order* function.

The greater (positive) the value the further the object will be brought to the front, the smaller (negative) the further it will be sent to the back.

This ranking will always be related to the ranking of other marks. So if the rabking of one object is set to "17" and the one of another object set to "88", the object rated "17" will be masked with the one rated "88". A third markierung rated "33" would have an intermediate plotting order.

Waypoint



Additional to the options listed above, the following are available specifically for waypoints:

Show WP description

If enabled, the waypoint description will be plotted with the symbol.

Show Date

If enabled, the date of the waypoint will be plotted with the symbol.

Show Coordinates

If enabled, the coordinates of the waypoint will be plotted in the units as defined.

Symbol

Here you can select the set of waypoint symbols which is compatible to your GPS device.

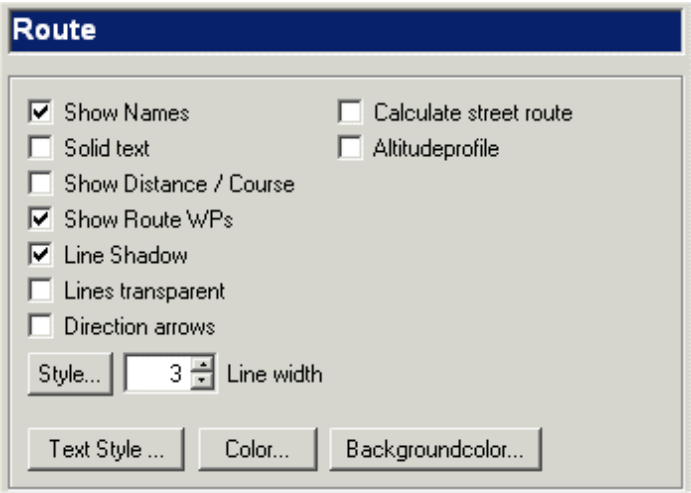
The individual symbols are then displayed in the box above and can be selected by a simple mouse click.

Note: Of course You can choose any symbol set you like. However, be aware that if you choose a symbol set which is not supported by your GPS unit, the symbols will be lost during GPS upload!

Symbol Size

Defines the size of the waypoint symbol in the map display.

Route



Additional to the options listed above, the following are available specifically for routes:

Show Distance/Course

If enabled, the distance and direction between two route waypoints will be plotted along on the route line that connects the two points.

Show Route WPs

If enabled, the route is shown completely including all route waypoints and connecting lines. When disabled, only the line is plotted and the route waypoints will be ignored.

Line Shadow

If enabled, the line will be shaded with a thin margin in the actual background color in order to improve visibility.

Lines transparent

If enabled, the lines will be plotted transparently.

Direction arrows

If enabled, the direction of the route will be indicated with arrows.

Style

When pressing the **Style** button, the line type can be chosen from a list of various patterns.

Line width

Each pattern can be plotted in a user-definable width.

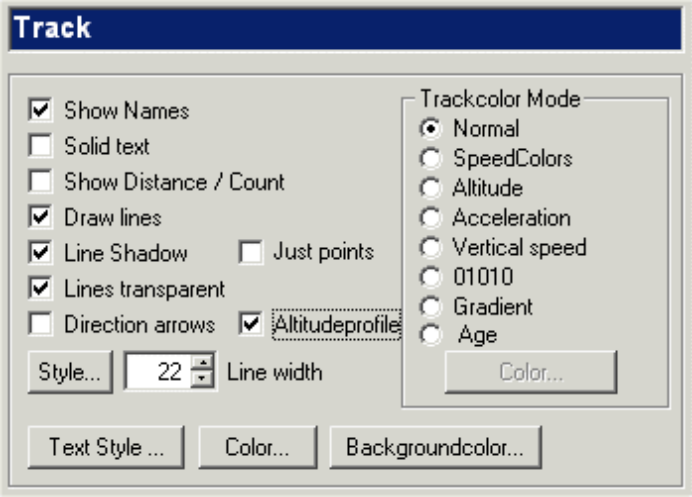
Calculate street route

If enabled, the automatic route calculation will be updated with each change of the route.

Note that this function will require the installation of a vector map with routing capability.

Altitudeprofile If enabled, the automatic altitude profile will be updated with each change of the route.
Note that this function will require the installation of a digital elevation model (DEM).

Track



Additional to the options listed above, the following are available specifically for tracks:

Show Distance/Number If enabled, the total track length and the number of trackpoints will be plotted at the first trackpoint as additional information.

Draw lines If disabled, only the trackpoints will be plotted without connecting lines.

Line Shadow If enabled, the line will be shaded with a thin margin in the actual background color in order to improve visibility.

With the **Only Points** switch you can restrict this shading effect to the trackpoints.

Lines transparent If enabled, the lines will be plotted transparently.

Direction arrows If enabled, the direction of the route will be indicated with arrows.

Style When pressing the **Style** button, the line type can be choosen from a list of various patterns.

Line width Each pattern can be plotted in a user-definable width.

Altitudeprofile If enabled, the automatic altitude profile will be updated with each change of the route.
Note that this function will require the installation of a digital elevation model (DEM).

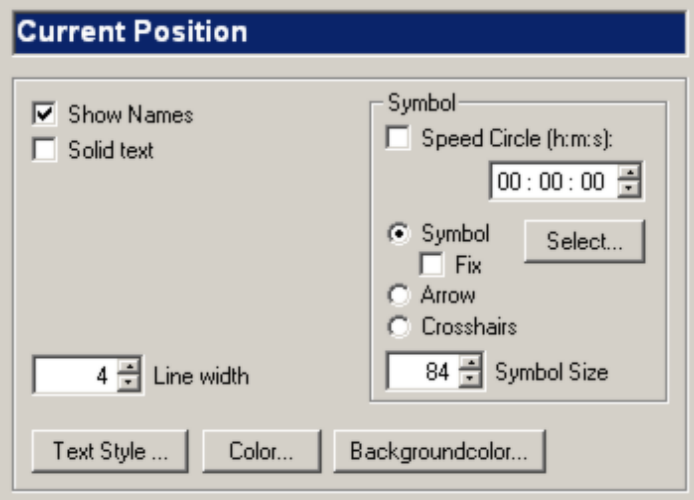
Color-coded Track mode

Tracks can be color-coded with a color scale according to the rating of various parameters. In this way, the distribution of parameter values can be visualized along the track line.

See chapter Color-coded Tracks.

Normal	Unicolored track line. The line will be plotted in the selected color and with a shaded margin in background color.
Speedcolors **Altitude** **Acceleration** **Vertical speed.** **Slope**	The color of the track line depends on the horizontal speed / altitude / acceleration / vertical speed / slope at the current track position. You can assign the parameter range and the corresponding color scale under **Adjust color range...**
01010	The track line will be plotted as a dashed line with two alternating colors.
Age	In this option a time interval can be specified and the color will code the age of the trackpoint. Meaningful only in the Online mode or during Multitracking.

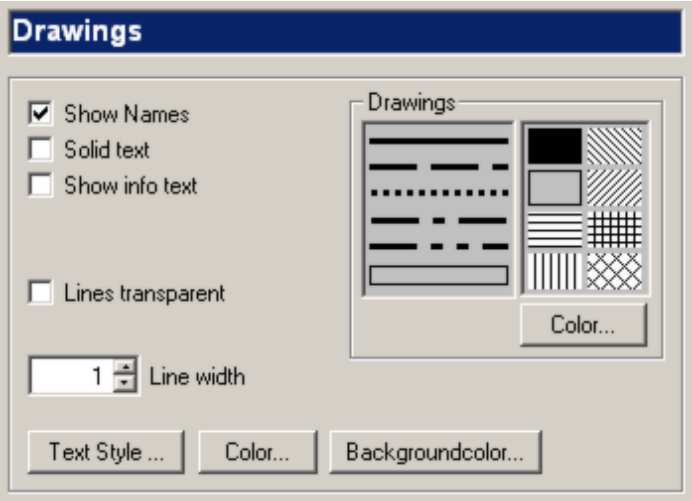
Current position in GPS Online Mode



Position symbol

Speed Circle	If activated, a circle will be drawn around the current position. Its radius corresponds to the distance which can be traveled at the current speed and within the defined time interval.
Symbol	Plots a bitmap symbol as current position. With the **Select** button you can choose your own symbol. Please note, that this must be a BMP file with 256 colors and a maximum size not exceeding 128x128 pixels.
Fix	If **FIX** is enabled, the symbol will not be rotated according to the actual heading.
Arrow	If enabled, an arrow will indicate your current position.
Crosshairs	If enabled, crosshairs will indicate your current position.

Drawings

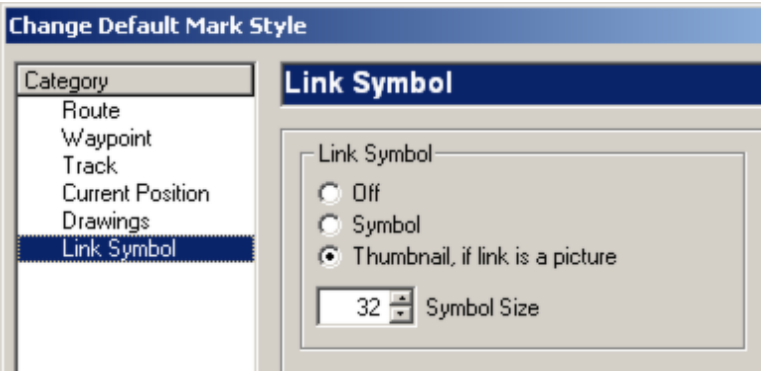


Show info text If enabled, a textbox will be shown with the content of the info field of the marking.

Lines transparent If enabled, the lines will be plotted transparently.

Line width Defines the line width.

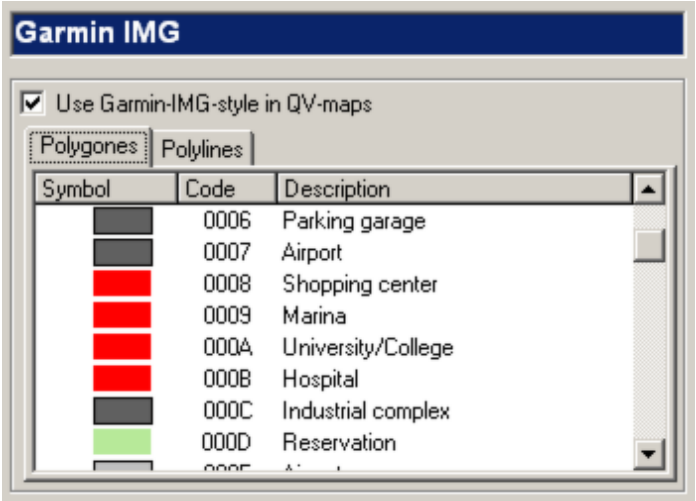
Link symbol

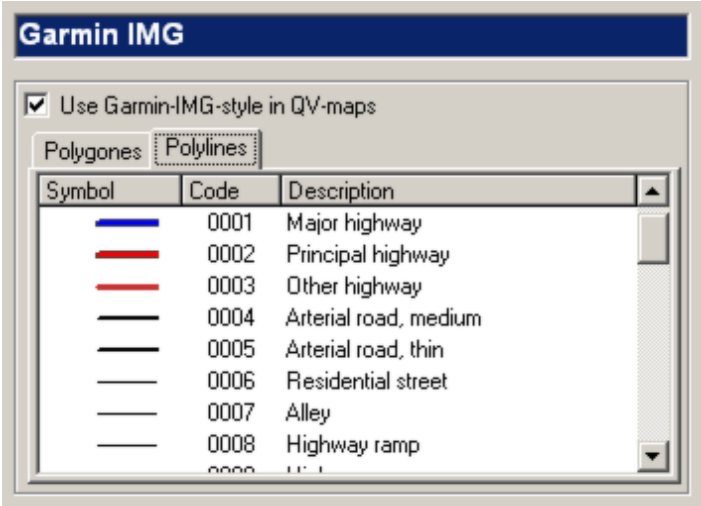


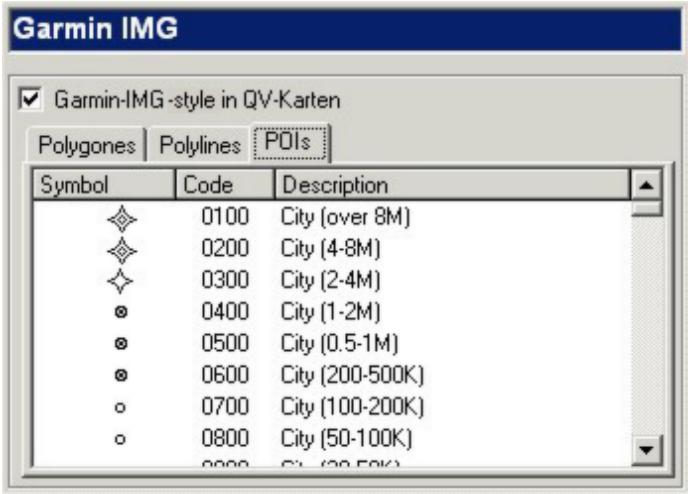
Refers to waypoints, routes, tracks and drawings only. If you have linked external documents, you can define here whether and how they should be displayed in map.

For further details please refer to Map Links.

Garmin IMG







If you want to create your own maps for upload to your Garmin GPSMAP plotter, you have to assign a Garmin style to your objects. Otherwise the corresponding object will not be plotted in the Garmin map display.

This is performed simply by selecting the desired attribute from a list (see examples given above).

The switch **Garmin-IMG Style in QV Maps** is independent from these settings. If disabled, all marks will be plotted as usual in *QV* map windows. If enabled, the selected Garmin style will also be used for *QV* map display.

You will find further details under Garmin IMG.

Waypoint vectors

Waypoint vectors are a special type of "drawing" which consist of a line with a given length (in meters) and a direction (in degrees as related to the geographic or magnetic North Pole). The origin of such a waypoint vector is a waypoint coordinate. Therefore a waypoint vector is always assigned to a specific waypoint. If you delete the waypoint, the waypoint vector will also be deleted.

Possible applications are bearings or triangulations.

In the map display a waypoint vector will be plotted as line which originates from the waypoint marking and will be drawn in the defined direction and with the specified length. It will be plotted in the same color as the waypoint. mark.

The fields with the corresponding vector length and direction can be found in the *detail window* of the *X-Plorer*.

However, it can also be edited directly in the map.

Entering a vector in the X-Plorer

- Mark the waypoint which should be converted to a waypoint vector in the *X-Plorer table window*.
- Enter the desired length and direction in the *X-Plorer detail window.*
- Tick-Mark **mag** in case the direction relates to magnetic north.
- Confirm your entries with the **Save** button.

Entering a vector in the map

- Right-click on the waypoint mark which should be converted to a waypoint vector and choose **Vector - New** from the pull-down menu.
- Now a rubberband line will stick to your mouse pointer and the length and direction of the vector will be listed in a yellow box and be updated with every mouse movement.
- Left-click with your mouse when you have reached the accurate position where the vector should end.

Deleting a vector

- Specify "0" as vector length if you want to delete the vector in the *X-Plorer detail window.*
- Right-click on the waypoint mark from which the vector should be deleted and choose **Vector - Delete** from the pull-down menu.

Markings pop-up menus

Markings pop-up menus

Most marking functions are executed through pop-up menus. You can access these pop-up menus with a right-click of your mouse on the mark symbol in the map window and can select the desired function from the list. When you move the mouse over a mark, the mouse pointer will change to the standard windows symbol. This indicates that you have hit the marking.

The available commands in the pop-up menus will vary with the type of marking. However, some commands are available with all marks:

X-Plorer...	Will open the *X-Plorer* and indicate the corresponding data base object.
Activate	As above but the map window will stay in front. Use this function if you want to create new waypoints in the same table as an existing waypoint which is visible in the same map. The corresponding database and table will be updated in the corresponding selection boxes and in the symbol bar.
Edit	Starts the Editing mode. Identical to the icon in the symbol bar.
Style...	Opens the Markings window where you can define all attributes for this specific mark. See chapter *Style - Settings for Marks*
Color	Shows a color palette for a quick selection a specific color.
Rename	Opens a text box to specify a new name. Hit he **Enter** key for saving the new name or **ESC** for canceling the change.
Show X.. menu...	Using this option you can open the pop-up menu of a specific marking type.
with X..= Track, Route Waypoint or Drawing	According to the addressed marking type, this is the Route / Track / Waypoint or Drawing menu.
Arrangement	Changes the drawing order of a specific objects in relation to the other objects.
Top most	
Bottom most	
One step up	
One step down	
Remove Mark from Map	Removes a mark from the map. Note that the mark will remain in the database.
Remove Mark from Map - Table	Removes all marks of the current table from the map. Note that the mark will remain in the database.
Delete from Database...	Removes a mark from the map <u>and</u> the database. See chapter *Delete and Restore*.
AutoNEW: copy this existing point	Copies a specific point as new point for the current AutoNew function.

Routing: Add as station...	Copies the marked point to the list of stop-over-points for the routing function. If you have selected a track or route, all points will be copied to the routing list. See street routing.
Navigation: Set as destination...	Defines the marked point as destination point for the routing function. See *GPS Online*.
Copy coordinates	Copies the coordinates of the map cursor (purple circle) to the Windows clipboard. See *Windows Clipboard*.
Convert coordinates	Returns the coordinates of the map cursor (purple circle) in various formats in an info window. Furthermore, altitude and magnetic declination as well as times for sunrise / sunset and moonrise / moonset are given. Visibility of the moon is specified in percent and decreasing visibility is indicated by a negative sign.
Map views/Neighbouring Maps...	Lists all available maps for the map cursor (purple circle) in a pop-up window for selection. Maps with a larger scale are indicated by a **+** sign, maps with a smaller scale with a **-** sign. Neighbouring maps will be searched in all four directions.
Show point in another map window	Plots the map cursor (purple circle) in other map windows. If no other map windows are opened, a pop-up window opens with a list of available maps for selection.

Jump to the next Point **Jump to the previous Point** **Jump to the first Point** **Jump to the last Point**	Skips to the corresponding point and moves the map accordingly. If necessary a neighbouring map will be opened.

Zoom	Adjusts the zoom scale in order to show the whole object.
XY Diagram	An XY diagram will be generated in a separate window. See chapter *XY Diagram*.
3D Diagram	A digital elevation model (3D view) will be generated in a separate window. See chapter *3D Diagram*.
Multipage Output ---> **Printer** **Export to BMP**	Using this function you can create a multipage output along a track or route on the printer, as a bitmap file or as a Pathaway map file.
Export Map to PDA PathAway...	See *Printing* chapter.

Vector --->	Available for waypoints only:
New	Creates or deletes waypoint vectors.
Delete	
Move	Moves the point to a new position.
Delete point...	Deletes a point.
Insert point in this line (dynamic)	Inserts a point into a line which can directly be moved to another place.
Window selection --->	Switches into a window drag-up mode with these options:
Copy	Copies all points within the window into the windows dashboard for later adding to an *X-Plorer* Table.
Delete Points	Deletes all points within the window.
Color	Change point color (only available with trackpoints).

Additional for Trackpoint Marks

Switch First Point Switch function:

If this point currently has a *First Point* status, it will be merges with the previous track section.

If this trackpoint is within a track section (vertex point) it will be changed to a *First Point*. This results in a brake up of the track in two sections.

You can control this editing directly in the map.

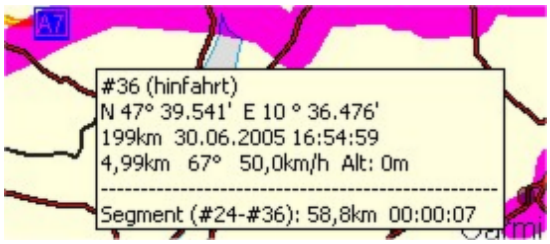
Divide track here Divides the track at this position. Two new tracks are created, one starting at the beginning of the track going to the selected trackpoint, and the second starting at the selected trackpoint going to the end of the track.
The original track keeps unchanged.

Track name here Places the track label at this position

Trackreplay from here Starts *Track Replay* from this trackpoint.

See chapter Track Replay.

Segment---> Measuring distances and times between two trackpoints. The values are displayed in the Tooltipbox from the second trackpoint:



Set starting point At this trackpoint starts the segment for measuring, its the zero-point.

Reset Reset measuring

Additional for Track-Marks

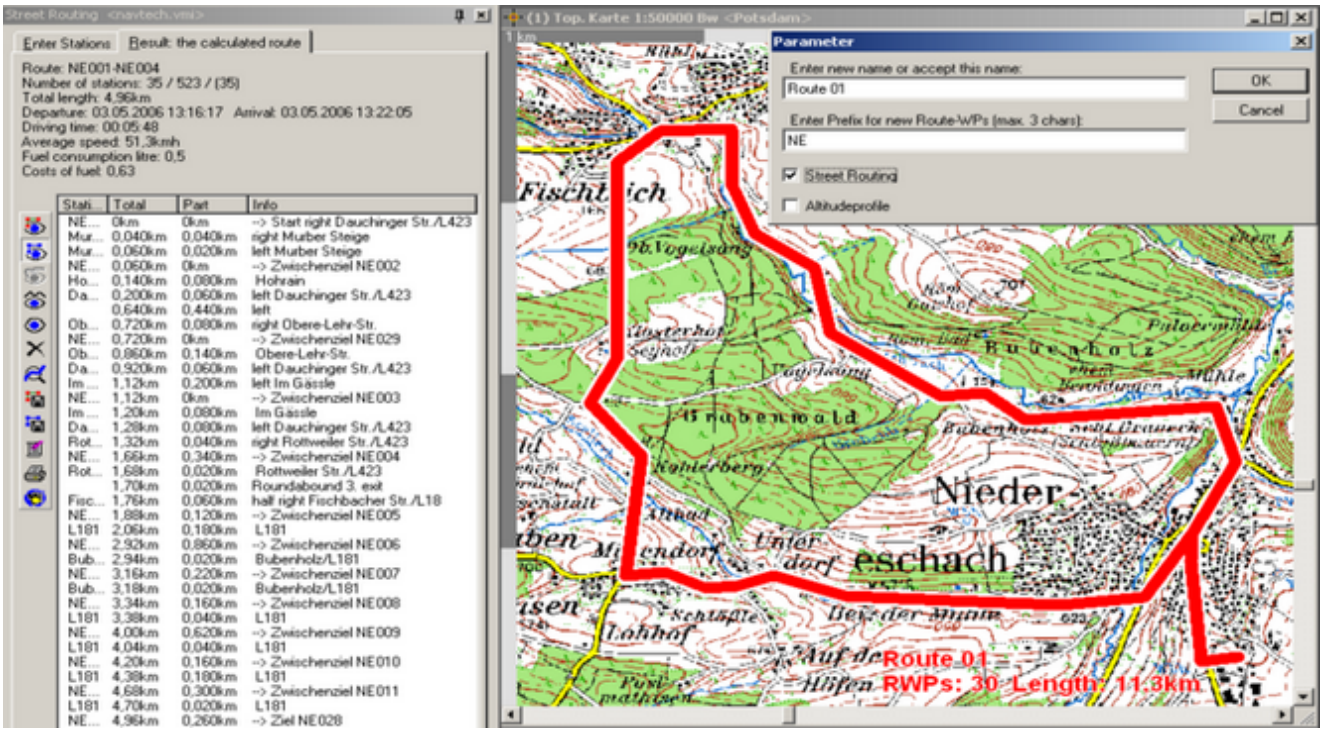
Track-Processor	Opens the *Track Processor*. The function offers various options to reduce trackpoint according to different schemes. See chapter Track Processor.
Track Replay	Starts the *Track Replay* mode for the complete track. See chapter Track Replay.
Trackcolor Mode --->	Controls the color coding of the track.
Normal	See chapter Color-coded Tracks.
01010	
Speed Colors	
Altitude	
Acceleration	
Vertical Speed	
Slope	
Age	
Adjust color range...	Defines the color coding scale.

Routes and tracks with automatic altitude profile and routing

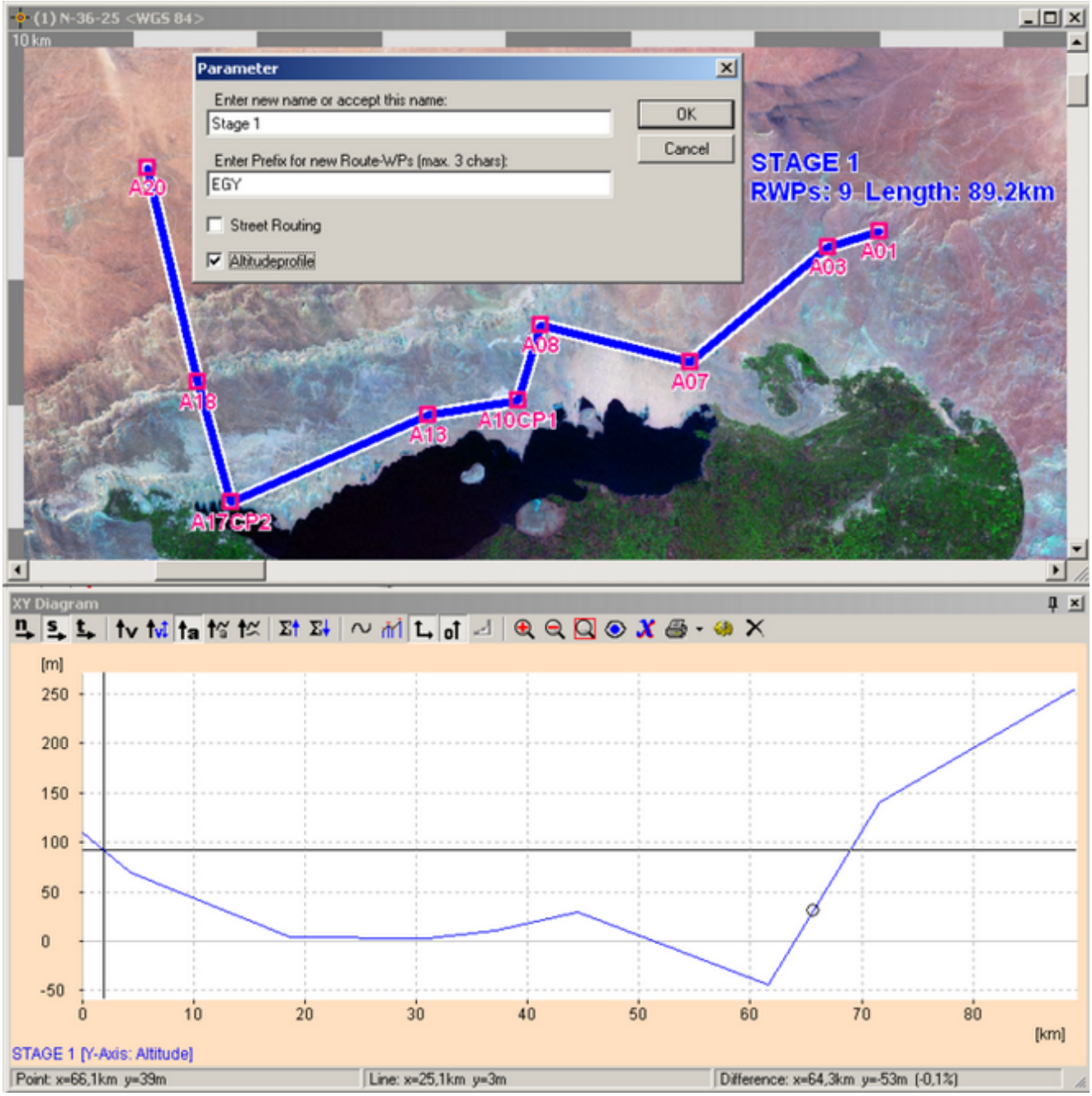
When planning a new route, a street route and an altitude profile can automatically be generated. With each modification of the routing data, the street route and the altitude profile will automatically be updated.

In the same way, an altitude profile can be generated while planing a track in the map window. Again, the profile will be immediately updated with each editing.

You can enable this option directly when starting the AutoNEW function:



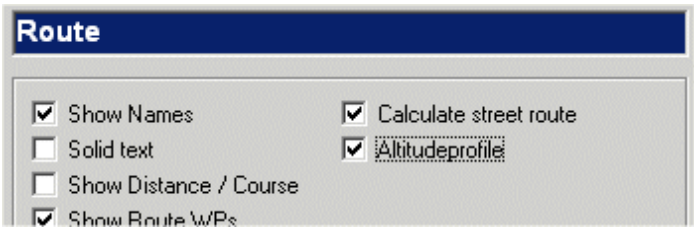
Enabling the automatic altitude profile is done in the same way:



Routes and tracks which are generated with this option will keep this property.

This means that whenever you use the *Show in Map* function, the street route and the altitude profile will be calculated.

However, you can disable these functions at any time under *Style* in the pop-up menu of any mark or enable these functions for tracks and routes which originally have been created without these options:



Note that only one route at a time with enabled routing function can be plotted in the map at a given time.
However various altitude profiles can be active at the same time.
Altitude profiles require a DEM to be installed in your *QV* system!

If you only want to view an altitude profile without enabling the auto-generating option, just choose **XY Diagram** from the pop-up menu which you access with a right-click on the track or route. As long as the diagram window is open, modifications of tracks and routes will also be updated.

Street Routing

Routing data

Routing means that the computer will calculate an optimal route from a given starting point to a destination, according to defined parameters. Stop-over points can also be specified in order to force certain stations to be implemented in the route.

The routing result will include a detailed list of waypoints such as crossings with instructions like "turn to the right", information on the intersection length and duration and the explicit course of the route as a map plot.

QV features all options for a comfortable planing of a route and to find your way on the road easily.

Street Routing is done in three steps:

- Defining of a starting point and a destination, and - if required - of additional stop-over points.
- Choosing or defining your personal preferences such as shortest or fastest way and trigger the route generation with the **Calculate** button.
- Checking the result and further processing of the waypoint list.

The whole procedure is controlled through the Routing window which you can access in various ways:

- By clicking the icon from the symbol bar in the main window
- On the keyboard by pressing **Ctrl - R**
- By selecting **Options - Street Routing** from the main menu bar
- By selecting **Routing: add as station...** from the pop-up menu of a point.

Automatic Routing

You can activate the Street Routing switch for any single route. *QV* will then automatically update the routing list when editing the route. For further details please refer to the chapter Street Routing, routes and tracks with automatic altitude profile.

Defining Stations

All stations consist of geographic coordinates and a name. Each point in *QV* can be defined as a street routing station:

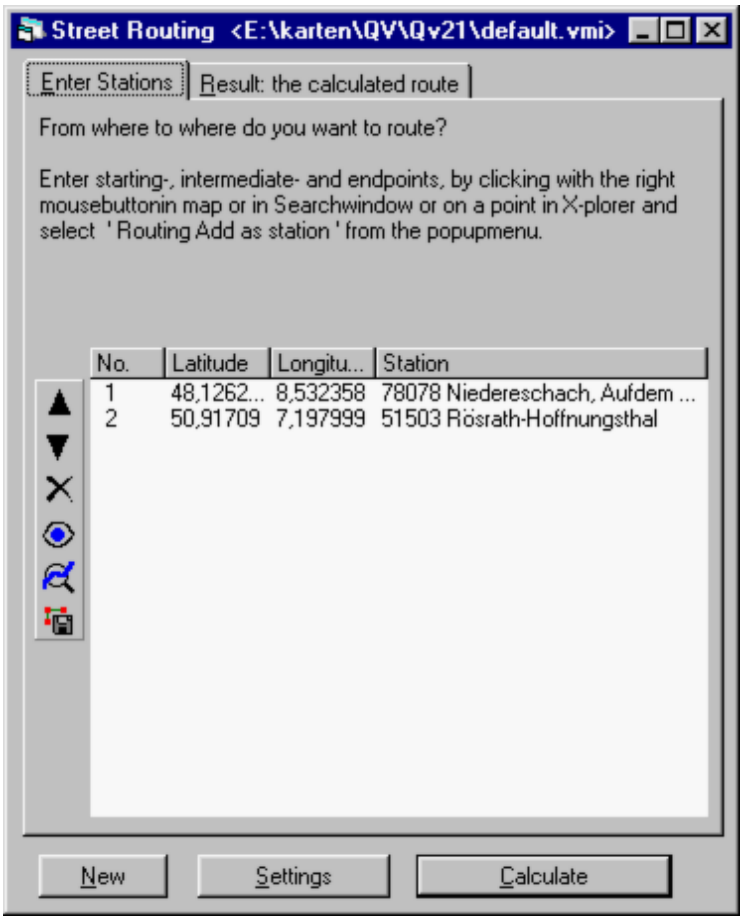
- any point in any map
- any waypoint in the *X-Plorer*
- any route waypoint from any route
- any trackpoint from any track
- any site from the geographic names database
- any waypoint or site which you found in the Search window.

You will find the option **Routing: add as station...** in the pop-up menu of each of these objects.

By selecting this menu option, the point will be added as a new station at the end of the station list.

If you choose this menu option from a track or route pop-up menu, the station list will be cleared and filled up with all waypoints of this route or all trackpoints of the track.

Please note when routing with the *Teleinfo* database the maximum number of stop-over points is limited to 100 stations; when you are routing with the *Navteq* database, you can include up to 500 stop-over points to the station list.



The following functions are available for editing the station list:

Move station one position up	Ctrl arrow up	Will move the station highlighted in blue one position up .
Move station one position down	Ctrl arrow down	Will move the station highlighted in blue one position down.
Delete	Del	Deletes the station from the list.
Show in map	Enter	Scroll the map within the map window and positions the map cursor on this station.
Show all in map		Scrolls and zooms the map in order to show the whole route in the map window.
Save station list		Stores the station list as a route in the *Route* table of the *Street Routing* database for later use. Please note that only the station list will be saved but not the final route.
Date and time of departure		If you specify the time of departure here, *QV* will calculate for every station point the estimated time of arrival.
Recently used Waypoints		All stations previously used and also the HOME point can be very quickly accessed and added to the list using this button.

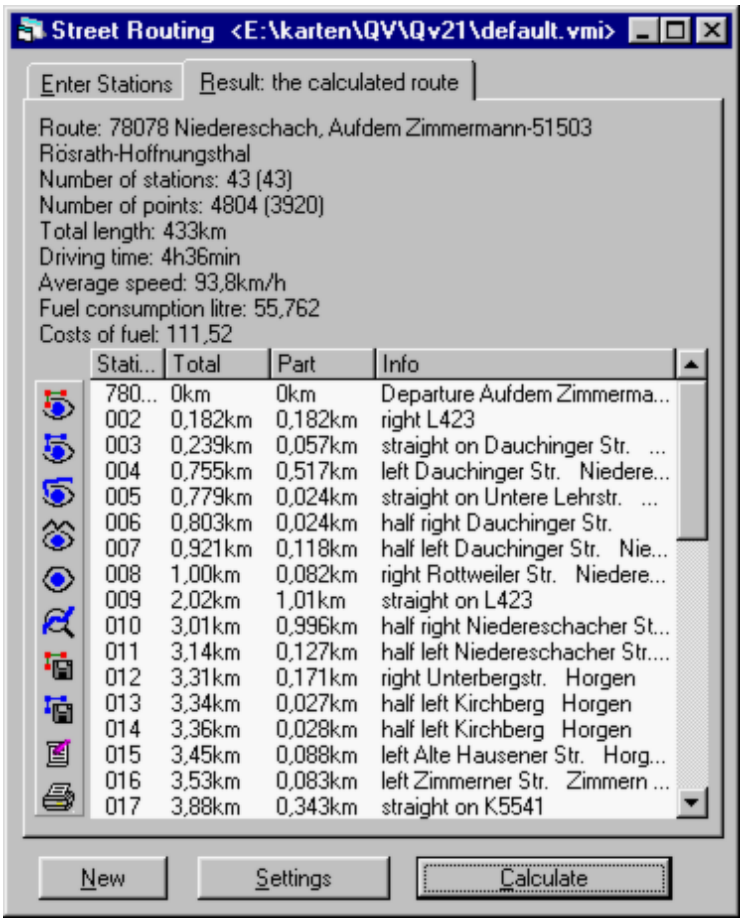
Calculation of the Route

Simply click on the **Calculate** button and *QV* will generate the route according to your currently selected preference settings. According to the length and complexity of the station list, this may take quite a while. However you can cancel the calculation whenever you like.

By clicking the **Settings** button, you can open a window where you can define basic routing settings and also your personal preferences. See *Street Routing* settings.

With the **New** button you can clear the station list and the calculated route and start a new route with the definition of new stations.

Result window with the calculated Route



Here you see an example for the result of a route calculation. On the top you find general information on the route such as length, duration of travel, costs, etc. Below you find the detailed table with all stations of the route. Each line refers to a station with name, distances from the start and relative to the last stop-over-point and a navigation instruction.

To the left you find icons offering various functions and commands:

Show result as QV Route	Displays the calculated route as a *QV Route* on a map. All maps are suitable for this option.
Show result as QV Track	Displays the calculated route as a *QV Track* on a map. All maps are suitable for this option.
Show result as marking in vector map	Displays the calculated route shaded in blue on a vector map (not available with raster maps).
Show in map	Scroll the map within the map window and positions the map cursor on this station.

Delete	Delete stations from the result list which may be desirable before storing (can also be done using the DEL key).
Zoom to whole route	Scrolls and zooms the map in order to show the whole route in the map window.
Save result as QV route	Stores the result as a route in the *Route* table of the *Street Routing* database for later use.
Save result as QV track	Stores the result as a track in the *Track* table of the *Street Routing* database for later use. Please note that it might be wise to reduce the number of trackpoints first.
Save to Roadbook	Starts the Roadbook Editor and transfers the route. Please note that the distances will correspond to the real distances in kilometres as calculated.
Print	Prints the result list.
Send route to Digi-Map	Copies the route to the Hotsync directory for a later transfer to your Digi-Map application on your Palm.

Street Routing settings

This window summarizes all street routing parameters and the corresponding paths to the vector maps. There are several options available to access this window:

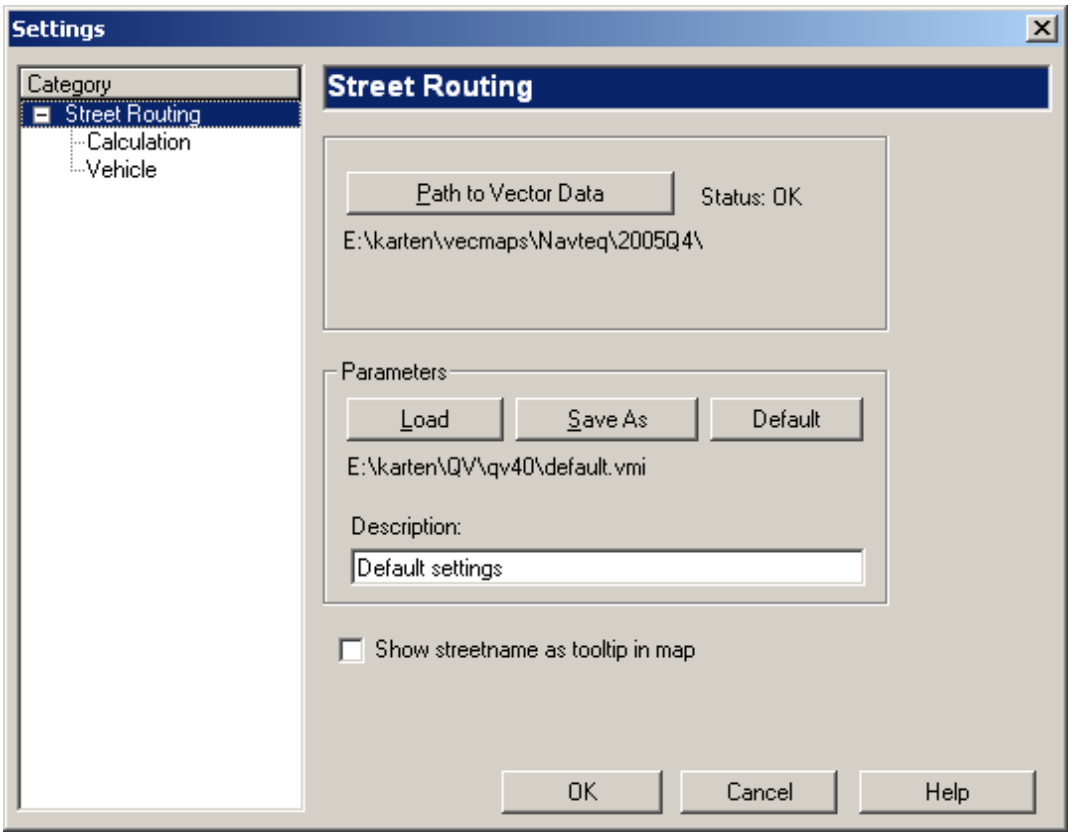
- By selecting **settings** from the pull-down menu after clicking the Street Routing icon in the symbol bar of the main window
- By selecting **Options - Settings - Street Routing Settings** from the main menu bar
- By clicking on the **Settings** button in the **Street Routing** window.

Two buttons are available at the button of this window:

Cancel Closes the window without saving the settings.

Ok Saves the settings and closes the window.

Vector map settings and parameter definitions



In this window you define the basic street routing settings.

Path to Vector data

Define the path to the vector maps here. With the *Navteq* maps this is the path and directory which contains the **.qvc* files.

With *Teleinfo* maps this is the path to the directory containing the subdirectories *DbKarte*, *DbRoute* and *DbOrtStr*.

If *OK* is indicated as current status, *QV* has identified the maps and implemented them correctly.

Normally the path to the routing database will be defined automatically as part of the installation procedure. However, the path can also be set manually if required.

If the path is modified, the maps **TTQV Navteq Europa** or **TTQV Teleinfo Europa** will automatically be updated or created in the *Vektor Karte* table within the *Strassen-Routing* database.

Load, Save as

All parameters which can be configured in this window (including vector map and database definitions and vehicle parameters) are saved in a file and will be loaded during program start.

You can create various sets of such parameter files (**.vmi*) for example to switch between different vehicle types. Simply click the **Save as** button to store the current settings in a file or click **Load** in order to reactivate previous settings.

The name of the active parameter file will be indicated below the buttons.

Under **Description** you can enter a remark to every stored file.

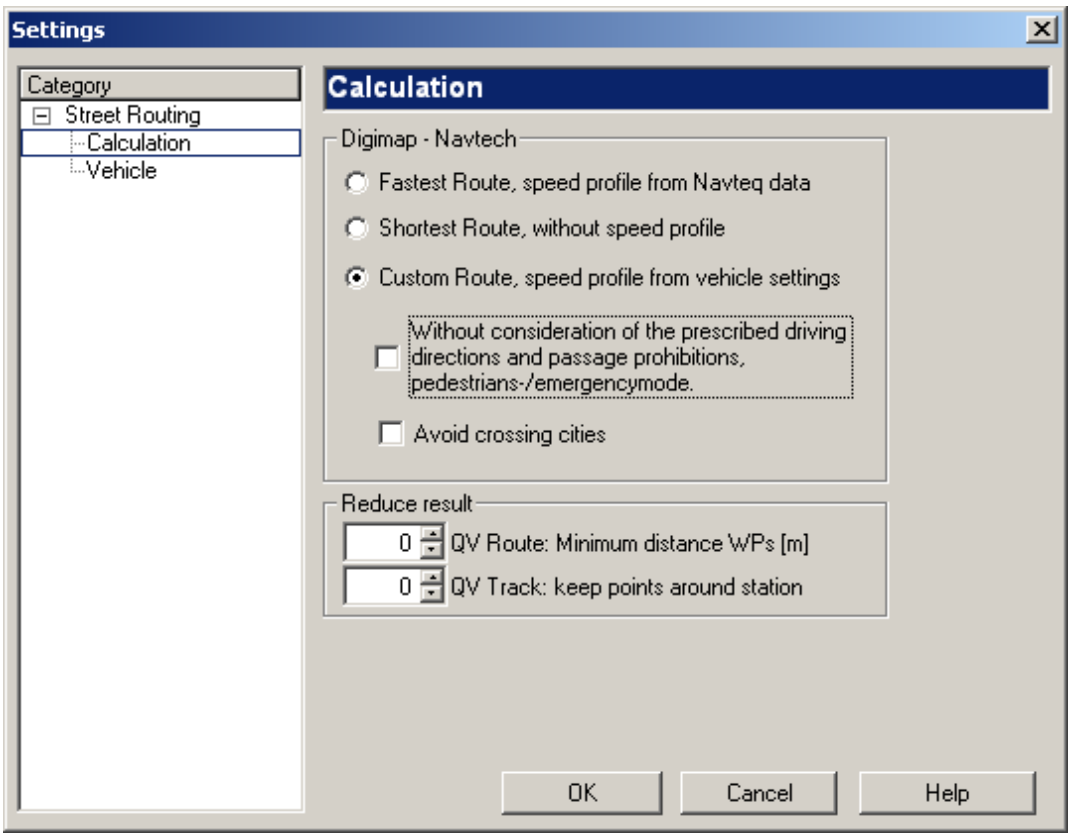
Default

If you click on this button, all parameters will be reset to default values.

Show streetname as a tooltip in map

If enabled, *QV* will indicate the street name corresponding to the actual mouse pointer position in any map (including satellite images).

Street Routing Settings with NAVTEQ vector maps



In this menu you define your personal preferences on how the route should be calculated.

Fastest Route The route will be optimized for minimum travelling time. The individual vehicle parameters will be ignored. Instead, the stored average speeds for different road categories will be taken from the Navteq database.

Shortest Route The route will be optimized for minimum distance. Travelling times will be ignored.

Custom Route The route will be optimized for minimum travelling time according to your individual settings. The average speeds for different road categories will be taken from the table defined under *Vehicle*.

Furthermore, your individual preference for different road categories will be considered. These are also defined under *Vehicle*.

Pedestrians-/emergencymode
If enabled, road traffic regulations will be ignored. Roads closed to public traffic will be considered for route calculation and you may be guided in opposite direction through a one way street. So, use this option *carefully* and only when you are travelling on foot or by bike!

Avoid crossing cities
If possible, cross-town navigation will be prevented.

QV Route: Minimum distance WPs [m] This option will reduce the no. of route waypoints. Stop-over points which are very close to each other will be eliminated.

Specifying "0" will disable the function.

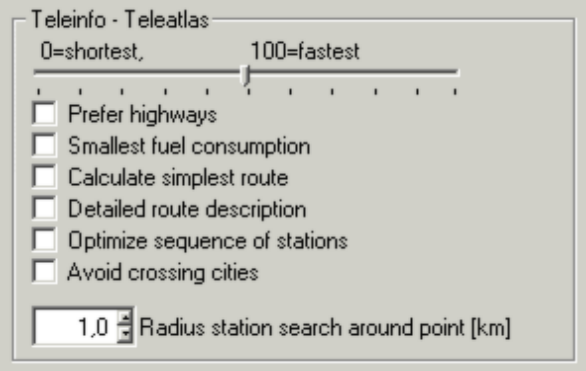
This function helps to save memory due to limited capacity of your GPS unit.

QV Track: Keep points around stations This function will also help greatly decrease memory requirements of your GPS unit. The exact course of a route will only be saved around stop-over stations while the course between stations will just be indicated with a straight line.

Specifying "0" will disable the function.

Street Routing Settings with TELEINFO vector maps

The *Teleinfo* map has its own Routing engine with somehow modified parameters.
The differences are described below:



Shortest ... fastest With this slide bar you can define your personal routing preference between shortest route ("0") and fastest route ("100").

Prefer highways If enabled and possible, highways will be preferred for route calculation.

Smallest fuel consumption If enabled, the routing result will be optimized for the least fuel consumption possible.

Calculate simplest route The route will be calculated in order to minimize junctions.

Avoid crossing cities If enabled and possible, cross-town navigation will be prevented.

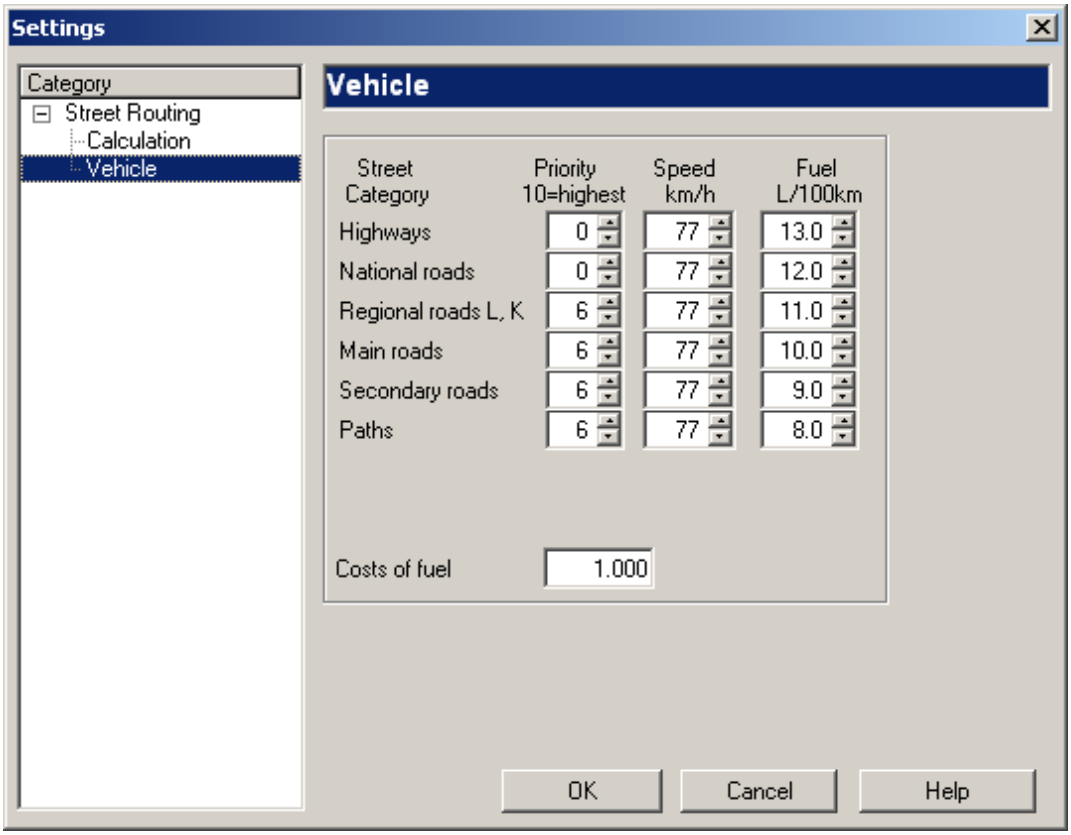
Optimize sequence of stations If enabled, the sequence of stations will automatically be optimized. Only the order of stop-over points will be modified, the starting and destination points keep unchanged. Therefore, this switch is meaningful only if at least 4 stations have been entered.

If this function is active, a maximum of 20 stations can be entered, otherwise a maximum of 100 stations may be included.

Detailed route description If enabled, a detailed routing list with much more waypoints will be created.

Radius stations search around point [km] Defines the search radius from a point to search for the closest road (in case that the coordinates are off-road).

Vehicle parameter settings



Street Category

The routing engines differentiates between 8 Street categories ranging from highways down to the small paths.

Generally, small paths are forestry roads which are usually closed for public traffic. So, with the *Navteq* map, small roads only make sense with the *walkers and bikers* switch enabled.

Priority

Defines the priority for route calculation.

If the priority is set to "0", the corresponding street category will be ignored while a priority rating of "10" refers to the maximum priority level.

Speed

In this column the average speeds for each street category can be assigned. Together with the *shortest … fastest* slide bar setting (*Teleinfo* map), this value will be considered for a calculation of the fastest route. The specified average speeds will also affect the results for the calculated travelling time.

If you use the Navteq database for routing, you must switch to **Custom Route** under **Route Calculation**; otherwise the speeds which you have entered here will be ignored.

Fuel consumption

Specify the average fuel consumption for your vehicle in this column (in L/100km). The values will be used for the calculation the amount of fuel consumed. Note the difference between the routing map types:

Navteq: will always be calculated.

Teleinfo: only considered if *Smallest fuel consumption* is activated.

Costs for fuel

Specify the fuel cost in price per liter. This value will be used for calculating the travelling costs.

HOME point

Calculate the Route to the HOME Point

You can execute this function by selecting **Options - Calculate Route to HOME Point** from the pull-down menu of the main menu bar or by pressing **Ctrl-H**.

Immediately, a route from the actual starting point to your HOME point will be calculated and shown on the map. The *Routing Window* will not be opened. This function requires a previous definition of the HOME point.

During GPS online mode, the starting point will be your actual position, otherwise it will be the current cursor position (purple circle).

The target point for the calculated route is the waypoint which has been assigned as HOME point by selecting **Set as HOME Point** from the waypoint pop-up menu in the *QV X-Plorer*.

The routing will be performed with the actual *Street Routing* settings. If a map is opened, the route will be plotted as a blue line, irrespective if the corresponding vector map or another map type is currently opened.

You can now switch to the *Street Routing Window* and check the details on the calculated route.

The function **Show HOME Point in Map** in the map pop-up window or in the **Options** menu will set the map cursor to the actual HOME Point setting.

The reverse function **Calculate Route from HOME Point** is also available in the **Options** menu and will calculate a route from the actual HOME Point to the present cursor point, e.g. in the reverse direction.

If you got lost, for example in a foreign town, just press *Ctrl+H* in order to get a route plotted from your current position to your destination. Of course this requires that you have set your destination as HOME point before you left.

Old vector maps

The information in this manual relates to the 2005/Q4 *Navteq* map version that will be supplied from *QV4* onwards but also applies analogically to earlier *Navteq* maps that can obviously still be used.

The somewhat different settings for the older *Teleinfo* map are only described briefly here because this map is no longer available. Anyone who still has an old *Teleinfo* map can, of course, still use it in *QV*. The exact options are described in the old QV3 manual.

Old Navteq maps prior to 2005/Q4

Of course these maps can still be used.

In order to use these maps it is essential that you copy the DLL's on the old map CD to the *TTQV4* directory.

You must not use the new qv_vec.dll that is installed with *QV4*!

These are the 4 or 5 DLL's in the **qv_vec_dll** folder which should be copied:

qv_vec_f.dll
qv_vec_e.dll
qv_vec.dll
qv_vec_d.dll
(if available: zlib1.dll)

For further information and a download link for all previous DLL's please refer to http://forum.ttqv.com/viewtopic.php?t=7749.

Old Teleinfo maps

It is essential that you copy the DLL's on the old map CD to the *TTQV4* directory.

These are the 5 DLL's in the **ti_dll** folder which should be copied:

MAPLIB.DLL
DataBase.dll
OrtStrLib.dll
RouteWeg.dll
MRouter.dll

Unfortunately these DLL's are not on the very old Teleinfo CD. In this case you will still find the DLL's in your old TTQV3 directory. So just copy the DLL's from there into the *TTQV4* directory.

GPS

GPS

Together with the map and database section, the GPS functionality is a third striking argument for *QV*.

The GPS functions support:

- Upload of waypoints, routes and tracks from the *QV* database to your GPS unit.
- Download of waypoints, routes and tracks from your GPS unit to the *QV* database.
- Show your current position, speed, heading, altitude and track in online mode during your travel and save the route covered in the tracklog.
- Viewing and analyzing of your GPS data on various maps.
- Compatibility with GPS units of leading manufacturers such as Garmin, Magellan, Lowrance and Eagle (data transfer and online mode)
- Compatibility with most GPS receivers in the NMEA mode for GPS online applications.
- Map upload with Garmin GPSMAP plotters (IMG - files only)

Connecting the GPS unit

You will need a connection cable which connects your GPS unit with the serial interface of the computer. This cable is available in many designs. Please contact your GPS dealer if you need a cable. You will have to specify the exact GPS model in order to buy the right cable.

Insert the connector (Sub-D9) into a free serial interface (COM) of your computer. Connect the other end to your GPS. Please note the instructions in the manual of your unit.

An aerial does not have to be connected to transfer data on waypoints, routes and tracks. To save battery power, you can switch a number of GPS units to so-called simulator mode.

In GPS online mode, of course, GPS reception must be ensured, so an external GPS antenna may be required.

For safety reasons, please turn the units off when you connect the cable.

Setting the data transfer parameters

For data communication between *QV* and your GPS unit, you must configure the data transfer parameters once.

Enter the number of the serial port to which the cable is connected.

The baud rate and GPS protocol must correspond exactly to the parameters which are set in the GPS unit. You will find an explanation of the parameters for your GPS unit in the manual supplied with the GPS receiver.

Note that when selecting the NMEA protocol, you cannot exchange waypoints, routes and tracks. This setting is restricted to the GPS online mode.

In *QV*, select Options - Settings from the pull down menu and then the GPS tab.

See chapter *Settings - GPS*.

USB or serial interface?

All new Garmin receivers feature an full USB interface. If you use this port, configuration is reduced to tick-marking USB as port definition. All other units have to be connected through the serial port.

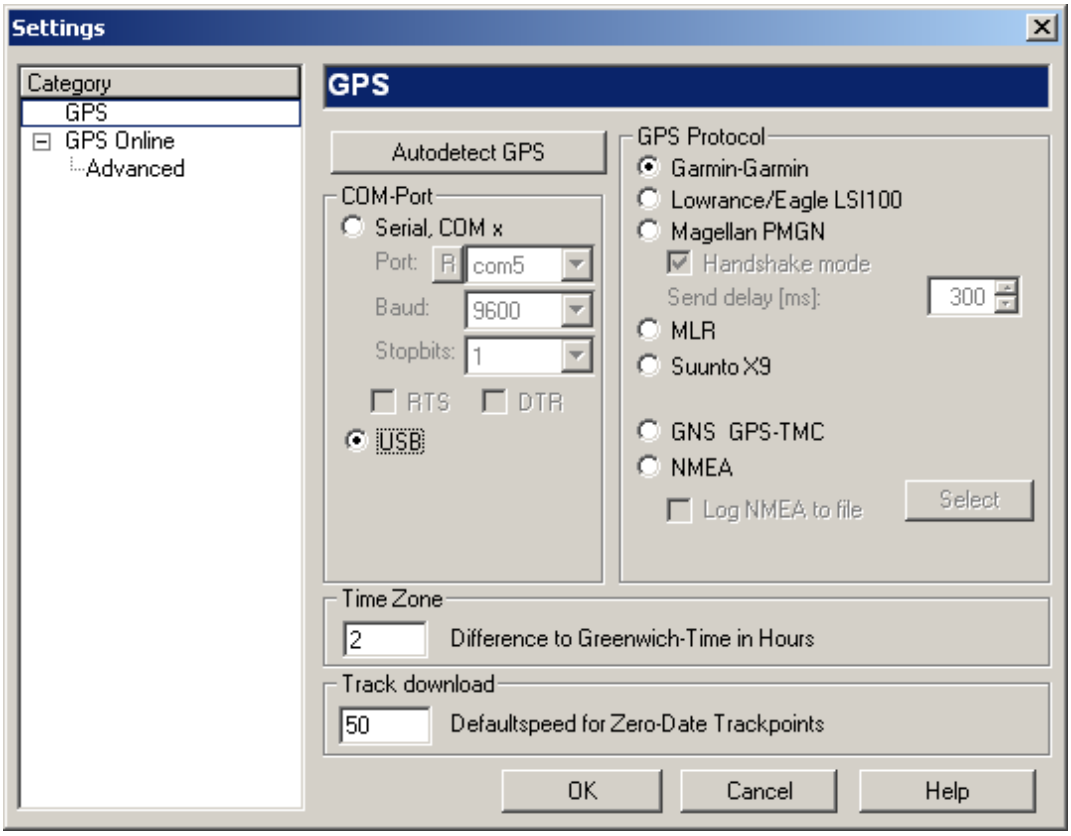
If your notebook does not feature a serial interface (this may be the case with new generation models), you have to use a serial-to-USB converter which will have to be implemented to your Windows system by installing a suitable driver (see hardware documentation of your converter). You can then connect your GPS unit to the serial port of your converter.

Important note: Although this converter is connected to a USB port of your PC you will have to select the serial interface as port in *QV*! However, *QV* facilitates correct configuration by indicating the ports which are implemented in your Windows system with a capital letter (Com

instead of com). Unavailable ports are listed lower case notation (in the example given below, COM1 can be used while com2 ... com8 are unavailable).

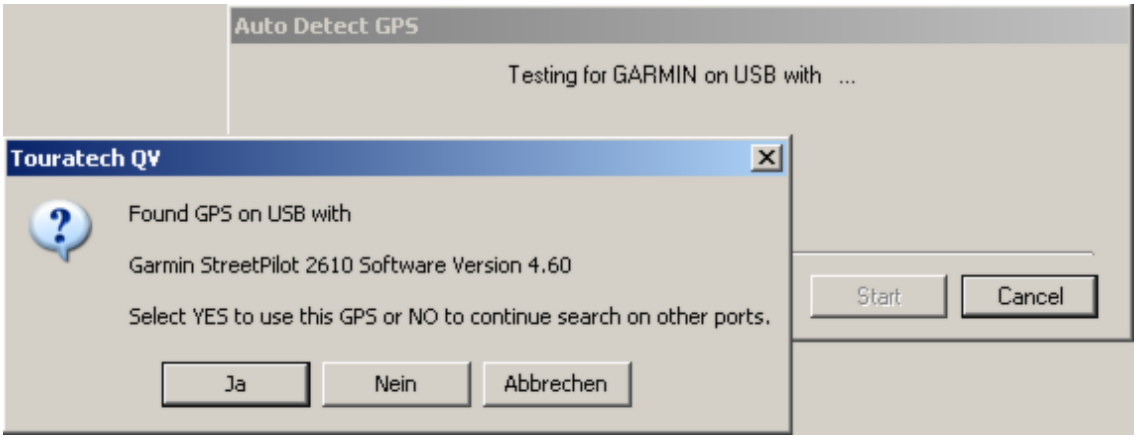
The simplest way to configure the GPS port is to use the **Auto Detect GPS** function which should work in most cases, except the GNS GPS-TNC unit.

For configuring the GPS transfer parameters, choose **Options - Settings** and then the **GPS** tab. Settings GPS:



Auto Detect GPS

This function scans all ports for connected GPS units. Please note that your GPS must be switched on. Garmin, Magellan or NMEA compatible units will be identified on the COM and USB port:



Sending data to the GPS device

All data have to be sent from the *QV X-Plorer*:

- Highlight the waypoints, routes or tracks that you want to send and click on the icon.
- If the GPS is turned on and the parameters are set properly, *QV* will immediately send the selected data to the GPS unit. A progress bar will indicate how this is proceeding.

Uploading tracks to Garmin units

When transferring tracks to Garmin units you should note these facts:

- All time information is lost, i.e. if these tracks will loaded back into *QV* later on, date and time is reset to *0*.
- Only a limited number of trackpoints is accepted by Garmin devices. Depending on the model the track memory can handle between 125 and 2000 points. *QV* will return a corresponding warning when uploading.
- The only way of sending longer tracks is the **Garmin Send Track ACTIVE LOG** command in the *X-Plorer* send menu. In this case the tracks will not be saved under *Saved Logs* but in the active tracklog which is normally used for en route recording.

Lowrance/Eagle Events

All data have to be sent from the *QV X-Plorer*:

- Highlight the waypoints that are to be sent in the *X-Plorer* list window.
- Then, select **Send WPs as events** from the send pop-up menu .

Using the **LEI Event** button in the *X-Plorer* detail window (WPs only) you can define waypoints permanently as an events. These waypoints can then be uploaded to your GPS device as usual and will automatically be addressed correctly.

Magellan Explorist

Data up- and download with these GPS units has to be handled in a completely different way. Please refer to the special *Magellan Explorist* chapter.

Downloading of data from the GPS device

As with data upload also the download of GPS data is done from the *QV X-Plorer* window:

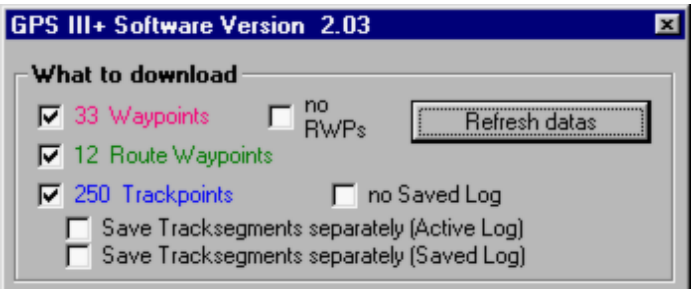
- First, select a waypoint, route or track table in the *X-Plorer* tree window. Thus, you determine what kind of data you want to download and where it should be saved.
- To download all the data click on a directory in the *X-Plorer* tree window. This creates a new database which contains a WP, route and track table.
- Now, click on the icon, to open the GPS download window in which you can select further options.

The GPS download window

This window appears directly before receiving GPS data. It consists of an upper part **What to download** and a lower part titled **Where to save**. The appearance of the upper part will depend on what data you want to receive and which GPS unit is connected.

In the title line of this window, the connected GPS model is specified.

Garmin



With Garmin units *QV* can query the amount of logged data and list the no. of objects in the download window.

Refresh data

Will query the Garmin unit once again for detecting the amount of logged data.

No RWPs

Will download all waypoints from the GPS device including those which are part of a route; however only waypoints that are <u>not</u> part of a route will be saved in *QV*.

No Saved Log

Will download all trackpoints from the GPS device including the Saved Logs; however, only the Active Log is saved in *QV* as a new track.

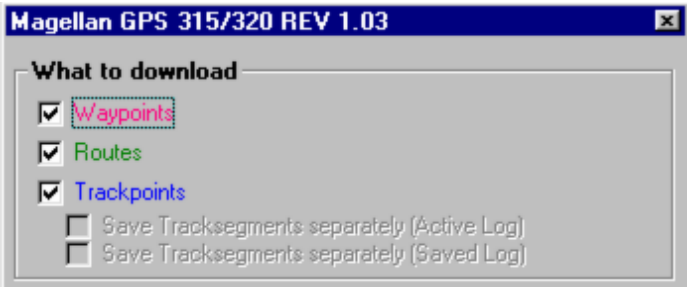
Save Track segments separately (Active Log)

If enabled (default), *QV* will save each track segment individually. The name is generated automatically according to this convention: Active Log DATA COUNTER. If disabled, all track segments of the tracklog are stored as one single track.

Save Track segments separately (Saved Log)

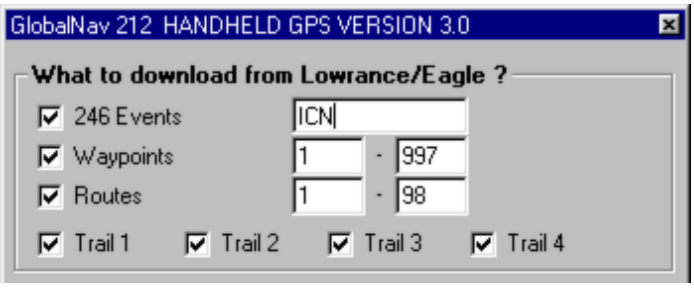
If enabled (default), *QV* will save each track segment individually. The name is generated automatically according to this convention: Active Log DATA COUNTER. If disabled, all track segments of the saved tracklog are stored as one single track.

Magellan



Magellan GPS devices do deliver any information on the amount of stored data and do not allow for a saving of track segments as separate tracks.

Lowrance



x Events

Events are waypoints with a symbol but no name. In *QV*, they are stored in a waypoint database and are labeled with consecutive numbers as names.
You can enter a prefix in the text field with a maximum of 3 characters, which is then placed in front of the consecutive numbering.

Waypoints

Waypoints are saved in Lowrance/Eagle GPS units under a number. You can specify the range of waypoint numbers which you want to download.
Unfortunately, *QV* cannot detect beforehand which numbers are currently used in the GPS device. It makes sense to specify the desired range as accurately as possible, so that the download will not take too long.

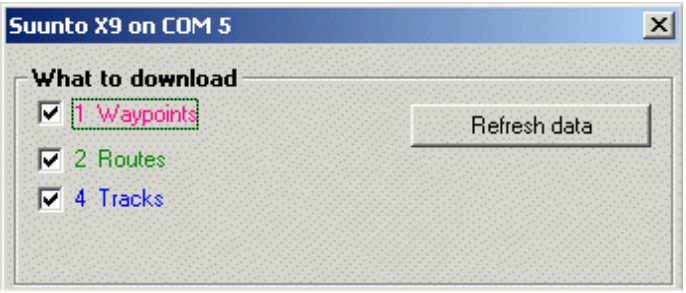
Routes

Routes are saved in Lowrance/Eagle GPS units under a number. You can specify the range of route numbers which you want to download.
Unfortunately, *QV* cannot detect beforehand which numbers are currently used in the GPS device. It makes sense to specify the desired range as accurately as possible, so that the download will not take too long.

Trails

Lowrance/Eagle GPS units feature a couple of fixed memory spaces for tracks (which are called Trails in the Lowrance/Eagle convention).
Select the number of the tracklog memory that you want to download.

Suunto

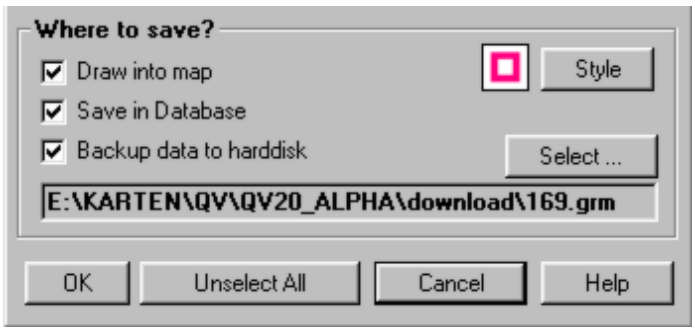


With Sunnto X9 units *QV* can query the amount of logged data and list the no. of objects in the download window.

Refresh data

Will query the Suunto unit once again for detecting the amount of logged data.

The lower part of the download window looks always the same and has the following options:



Draw into map	After downloading is finished, all data received will be immediately plotted on the map. This option is only available if **Save in Database** is enabled.
Save in database	This option should always be enabled so that all data will be saved in the database and will subsequently be listed in the *X-Plorer*.
Backup data on hard disk	If enabled, all data downloaded will be saved as a *PCX5* text file with the specified name. Using this option, a backup file of the GPS data is automatically generated.
Select	Clicking this button will open a file selection dialog box where you can enter the path and directory for the *PCX5* backup file.
Style	When data is received, the current style for marks will be assigned. Clicking this button will open the dialog box for defining the style for marks in order to adjust their look to your specific needs. For further details please refer to *Markings pop-up menus*. The GPS waypoint symbols will be used if they are available. Otherwise, the symbol currently selected will be used.
OK	Starts the download with the parameters defined. A progress bar indicator will keep you informed about the downloading process.

Garmin track segments

A segment is a sequence of trackpoints which have been recorded without interruption. With every interruption, e.g. when the unit has been turned off or after a reception failure, the receiver automatically creates a new track segment.

There are two types of track segments in Garmin units:

Active Logs:

In addition to the coordinates, active log points also contain date and time information. All points that the GPS unit logs automatically belong to the active tracklog.

Saved Logs:

In contrast to active log points these points no longer include date and time information.

Saved logs are generated in two ways:

With most Garmin GPS units when using the function *Save Active Log* which will store all points from the active log as a saved log under a name of your choice. When performing this command, the date and time information is lost and the unit will automatically reduces the number of points and merge all track segments to a single track.

Saved logs will also be created if you upload tracks from a second GPS device or from a PC with navigation software such as *QV*. In such a case, date and time information will also be lost, however the track segments will be retained.

Two switches are available in *QV* to control the way how track segments are handled.

For example if you want individual track segments to be stored separately also in *QV*, you should enable the switch **Save Track segments separately (Saved Log)**.

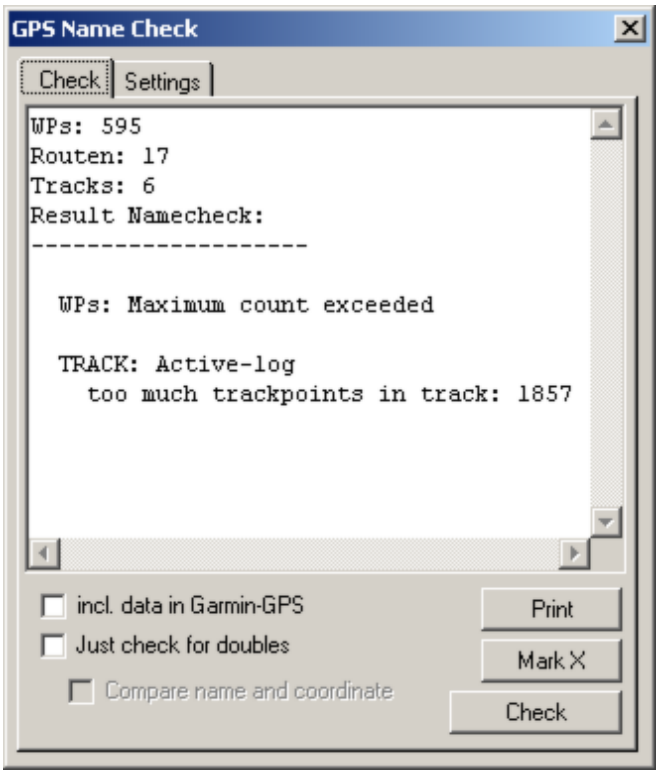
GPS name check

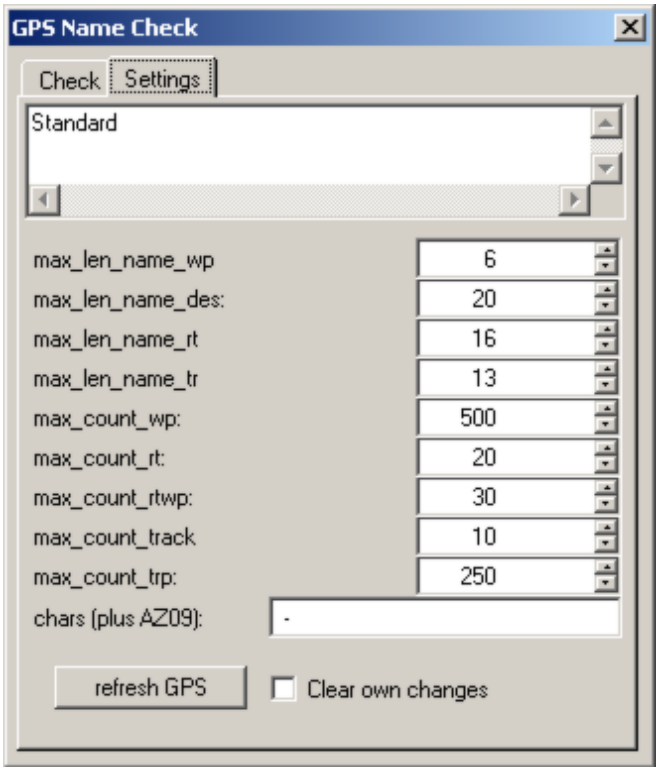
Many GPS units cannot save several waypoints under the same name. Also the maximum length of the name is limited. On the other hand you can enter almost any name in *QV*.

When uploading routes and waypoints to your GPS unit, this may cause conflicts, for instance if a specified name already exists in the GPS device or if the same name is used for different points in *QV*.

This function is intended for such cases.

Highlight all routes or waypoints that you want to transfer and select the **GPS Name Check** function. *QV* will check the data and list the results in a window. An example is given below:





The results are listed on the **Check** tab. You can see which waypoint names are duplicates and which names are too long. QV will specify a compatible, shortened name in brackets that will be sent to the GPS unit.

On the **Settings** tab you can view the parameters settings for the checking procedure. The parameters will be set by default when detecting a Garmin GPS device. However, you can modify the settings.

If conflicts have been detected, you should rename the corresponding data in the *QV X-Plorer* and repeat the test until the results are OK.

Check tab:

Incl. data of Garmin GPS	Includes the data presently stored in the GPS unit. If you press this button, *QV* downloads all waypoints from the GPS device. Subsequently run the check once again. This way you can check whether existing data would be overwritten.
Just check for doubles	By setting this switch you can disable the check for names with too many characters (long names). Only duplicates will be identified. Consequently, the results list will be shorter with a better overview.
Compare names and coordinates	This function will identify duplicates, i.e. waypoints where the name AND the coordinates are identical. If disabled, only waypoints with the same name (but different coordinates) will be filtered.
Print	Prints the list.
Mark X	Highlights the identified waypoints in the *X-Plorer*.

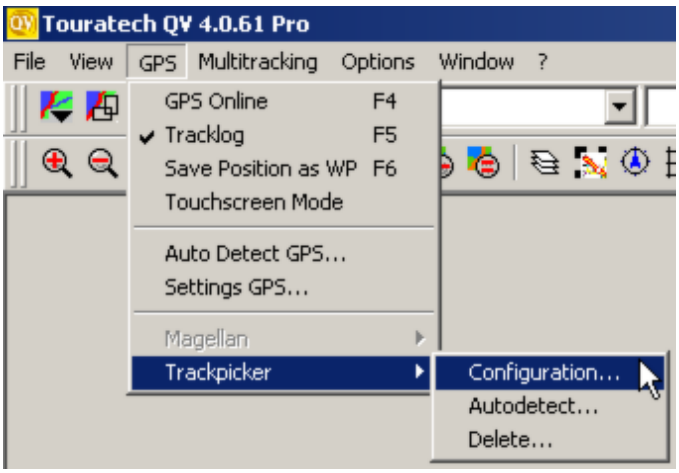
Settings tab:

Update GPS	When clicking this button, the GPS status information will be reloaded and all parameters are updated.

Trackpicker

The Trackpicker is a miniaturized GPS receiver with integrated logger and a capacity of some 120.000 trackpoints.

Configuration and data download can be directly performed from *QV* by choosing **Trackpicker** from the **GPS** menu of the main menu bar:



Please note that these commands will only function if you have installed the drivers from the *Trackpicker Manager* CD which were included in the *Trackpicker* package.

For further information please refer to the *Trackpicker* manual.

Magellan Explorist

The GPS units of the *Magellan Explorist* series do not support a direct communication with *QV*. Instead, routes, tracks and waypoints are copied as files on a SD memory card in the GPS unit. In order to exchange routes, tracks and waypoints between your *Explorist* and *QV* please follow this instruction:

First connect your explorist through the special Magellan USB cable with your PC. Then choose in the *Communication menu*
of your *Explorist* whether you want to exchange data with the internal memory or the SD memory card. Thereafter you will find the selected memory area as a new disk drive available in your Windows operation system, for example drive **H:** (the character ID may be different in your PC platform). The following steps differ whether you want to import or export data.

Import of data from your *Explorist* to *QV*:

- Choose a waypoints, routes- or track table in the *X-Plorer* tree window. By this you specify which kind of data (waypoints, tracks or routes) you want to download from your GPS unit and where they will be stored.
- Click the **Import** icon and choose **Magellan NMEA-Files** from the pull-down menu.
- Select the adequate disk drive ID (see above) and the path to the file which you want to import.
- Click **OK** and the import will be executed. If you want to import several objects or data types (waypoints, tracks, routes) you will have to repeat this procedure for several times.

Export of data from *QV* to your *Explorist*:

- Choose in the *X-Plorer* the data which you want to export.
- Click the **Export** icon and choose **Magellan NMEA-Files** from the pull-down menu.
- Select the adequate disk drive ID (see above) and define the directory and file name to which you want to save the exported data.
- Click **OK** and the export will be executed. If you have specified various object types for export (waypoints, tracks, routes) a separate file name will be asked for every object type.

GPS Online mode with the explorist

To operate the explorist in the *GPS online mode* you have to select **NMEA-Datacommunication > v2.1GSA** in the *Communication menu*. Furthermore, the USB driver must be installed from the Magellan-CD in order to simulate a serial interface through the USB cable. You will have to select this serial port in *QV* under **Settings - GPS** and choose **NMEA** or **Magellan** as protocol. Alternatively, you can also use the **Autodetect GPS** function.

It is essential that you follow the instructions provided by *Magellan* concerning the installation of the USB driver for your *Explorist*. Otherwise no communication will be possible and the SD memory card will not be identified as a disk drive under Windows!

Presently, maps cannot be up- or downloaded from *Magellan Explorist* units.

GPS online mode

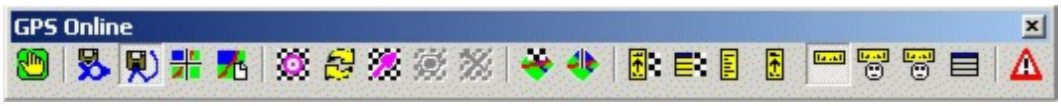
GPS online mode

This function shows your current position on the map during travelling. Also, the distance covered is shown as a track and saved (track log). You can specify a destination (target point) with the GOTO function or follow a route. In this case *QV* will always indicate the distance and bearing to your destination or the next stopover point and will automatically switch to the next waypoint when a stopover point has been passed.

QV can also calculate a route using the rooting function and you will only have to follow the plotted route on the map window.

The GPS Online mode can be started by clicking the icon in the symbol bar or by pressing **F4**.

QV will immediately connected to the GPS receiver and the toolbar GPS Online automatically opens. Here you can select various functions. A function is active when the corresponding symbol is highlighted (pushed button).

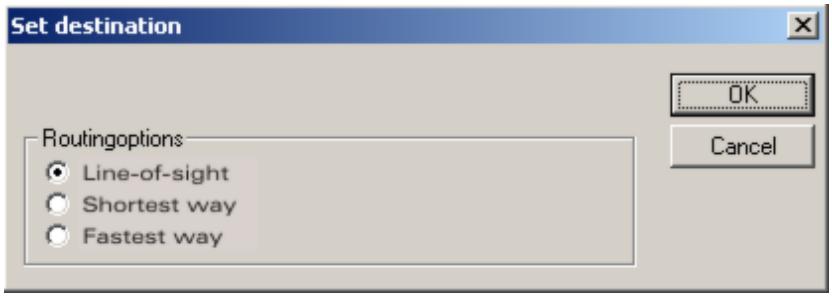


Touchscreen mode		Switches to the Touchscreen User Interface (see there).
Save position as WP	F6	Saves the current position as a waypoint. Can also be accessed quickly by pushing **F6**.
Tracklogging ON/OFF	F5	Saves the track in the track table. By default this function is enabled, but you can also disable it by clicking on this icon. Another click will enable it again. Can also be accessed quickly by pushing.
Center position in map		Moves the map within the map window so that your current position is centered.
Open an additional map		Opens an additional map in which your current position will also be indicated.

Set destination

Defines the current position of the map cursor as next destination and places a checkered flag at this position.

Thereafter a dialog box will open where you have to select the routing options:



Line-of-sight
Navigation along the line-of-sight. Only the direction and distance to your destination will be shown.

Shortest way
The shortest way to your destination will be calculated using the street network and the route will be plotted on the map.

Fastest way
The fastest route will be calculated using the street network and the route will be plotted on the map.

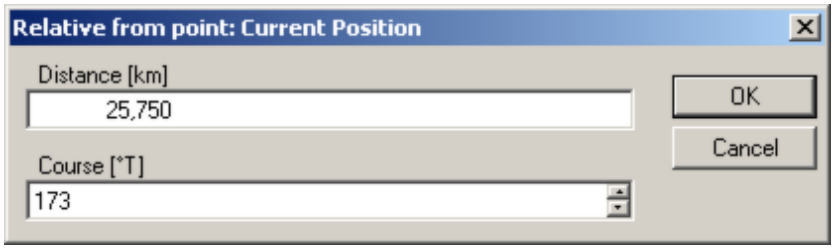
Finally a navigation info box opens showing this distance and course to this point.

Recalculating the route to your destination

Clicking on this icon you can recalculate your route, for example after you left or lost your current route. The routing algorithm will use the same destination as before.

Defining your destination by specifying bearing and distance

Clicking on this icon you can specify your destination by defining the bearing and distance from your current position:



Show destination

Shows your destination on the map. If necessary the map will be moved within the map window to show the destination.

Clear destination

Deletes the current destination setting.

Rotate map with destination towards the top

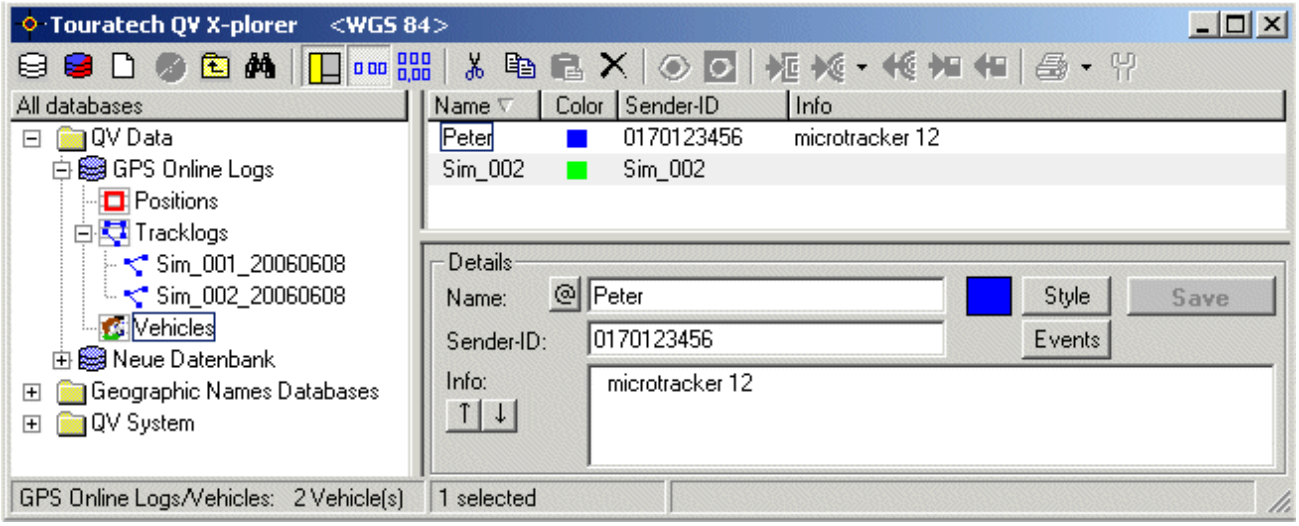
Will rotate the map in order to plot your destination towards the top of the screen.

Rotate map with course towards the top

Will rotate the map in order to plot your current course straight upwards.

Database objects

In the GPS Online mode various objects will be saved in the database:



A new database named **GPS Online Logs** is created in which all corresponding data are stored. Three different tables are stored in this database:

Positions Includes all positions which were saved with the function **Save position as WP** (**F6**).

Tracklogs Contains the Tracklog files.

Each Tracklog file has its own name which descends from the vehicle name and the date, e.g. GPS_*20051212*

Vehicles In this table the vehicles are stored. In the QV Light and Standard versions the default name is *GPS*.

Under **STYLE** you can modify the look of the position indicator.

With Events you can choose several actions and resulting events, see Events.

Track Logging

When track logging is active, *QV* will automatically save trackpoints at the set time interval. These track logs are saved in the **Tracklogs** table of the **GPS Online Logs** database. This database and the table are automatically created by *QV* if they do not already exist.

After closing the track log, you can rename, move, copy and delete a marked track, just as any other track in the *X-Plorer*. While the logging function is active, the track is locked and cannot be modified.

Each day, a new track log is started. This means that if you start a track log in the afternoon and had already created one in the morning, the new points will be attached to the existing log.

If you would like to avoid that, you have to rename the existing log beforehand and a new track log will be created.

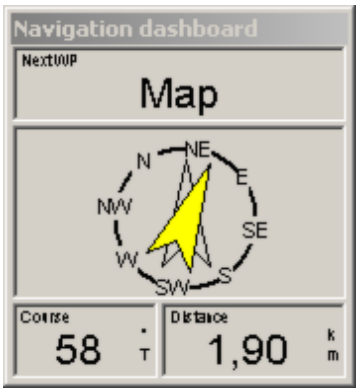
You can stop the track log at any time by pressing **F5** and restart logging by another keystroke if you want to interrupt the logging for a certain time.

Under **Settings - GPS Online**, you can specify whether track logging should be enabled by default when starting the GPS online mode. The time intervals between trackpoints can also be defined there in order to adapt the track log resolution to your requirements. You will find more details under GPS Online Settings.

Display types in the GPS online mode

In the GPS online mode various display types are available. All of display modes can be enabled and disabled independently, so all of them can be opened even simultaneously. They can be snapped to the main window or placed freely floating in the map window.

Navigation



This window shows heading, distance, course and next stopover point.

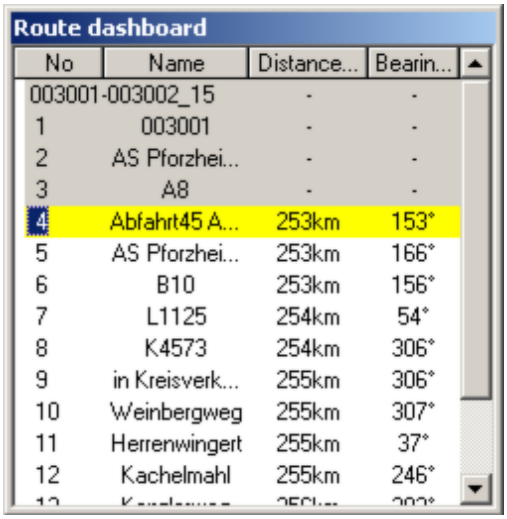
The color of the arrow indicates:

Yellow: You do not move along the direct path to your destination.

Red: You are currently moving away from your destination (distance will increase).

Green: You are moving towards your destination.

Route

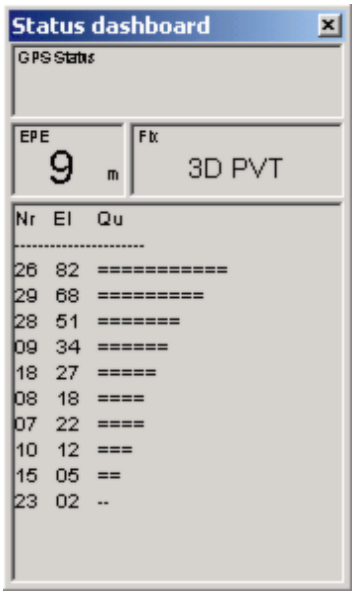


If you follow a route, you will see in this window the routing overview.

The points highlighted with a grey bar were already passed, the line highlighted in yellow is referring to your next stopover point and the lines which are not highlighted are the points still to come.

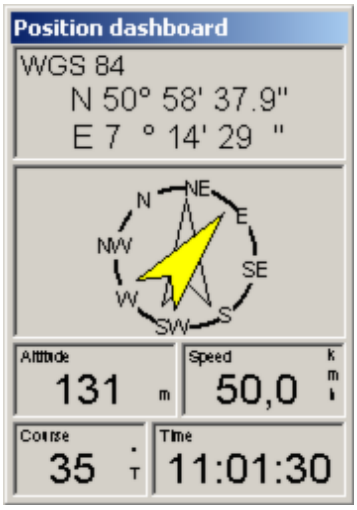
You can interact with the right mouse button. When street-routing is active, the stopover points including navigation instructions are listed.

Status



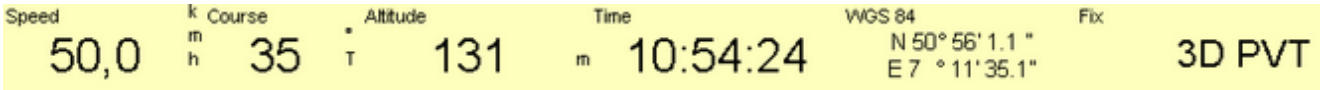
This window summarizes the satellite status and will list satellite no., fix category, EPE (estimated position error), signal quality and other information. This window will automatically pop to the front if any problem with the GPS signal is detected.

Position



This window lists coordinates, heading, speed, altitude and time.
Alternatively *QV* will show this information in a separate window or as a separate bar along the upper map window margin:

Position :



User 1, 2 :

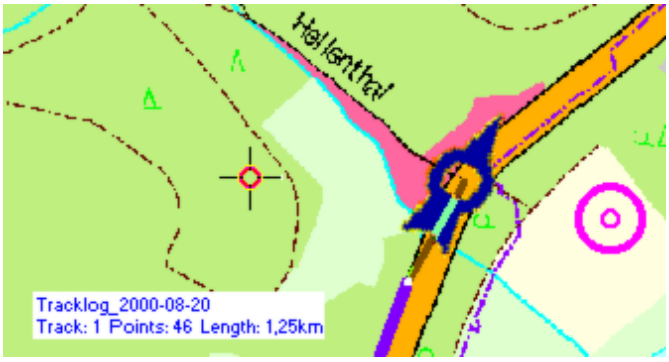
Two user-defined layouts are available. After a right-click with the mouse on this bar you can modify the fields of this bar according to your specific requirements.

Many function of the GPS online mode can be accessed through "hot keys" from the keyboard

see Appendix Keyboard Commands.
However, most comfortable operation is guaranteed with the total new Touchscreen mode which you can activate by a click on the icon.

Displaying the position on the map

An arrow appears on the map at the current position which will point to the direction of travel. When track logging is enabled, the arrow will draws a line which corresponds to the route traveled.



You can modify the layout, color and size of the symbol according to your preferences by selecting **Style** from the pop-up window which you access with a right mouse click on the symbol. You find a detailed description of the available options in the chapter Pop-up menu of vehicle.

AutoMAP in the GPS Online mode

The AutoMAP function ensures that a suitable map for the current position is being used. If you leave the range of the current map, the neighbouring map is automatically opened.
In the GPS online mode you can't search on the map yourself or open other maps manually to get an overview on where you are going.
However, you can switch manually to another map which contains the current position, e.g. by using the hotkeys CTRL (+) or (-). Please note that *QV* will only open another map if the current position is not visible on the map which is currently opened.
If you want to open other maps which do not show the current position or want to scroll on the current map, e.g. to follow the further course of your journey, you can disable the automatic plotting of your position by pressing the **space** bar of the keyboard. You can also click the icon. This will be indicated in the title line of the main window with the message *AUTOSCROLL IS OFF*. However, the GPS online mode and track logging are still active.
Press any key you like to close this mode and re-activate the Autoscroll function.

Night screen

During online mode it is rather uncomfortable for the eye to switch between the bright screen and the dark view outside.

For such conditions *QV* features the possibility to darken the screen by selecting one of 3 available options which can be accessed under **View - Night Screen** from the main menu bar:

Off
Normal, maps with original colors, Windows as at QV start.
Next
Scrolls through all modes using **Ctrl D**.
Dusk
Medium dim.

Dark
Strong dim.
Redlight
Switching to red light, brighter than night but more ergonomic for the eyes in the dark.

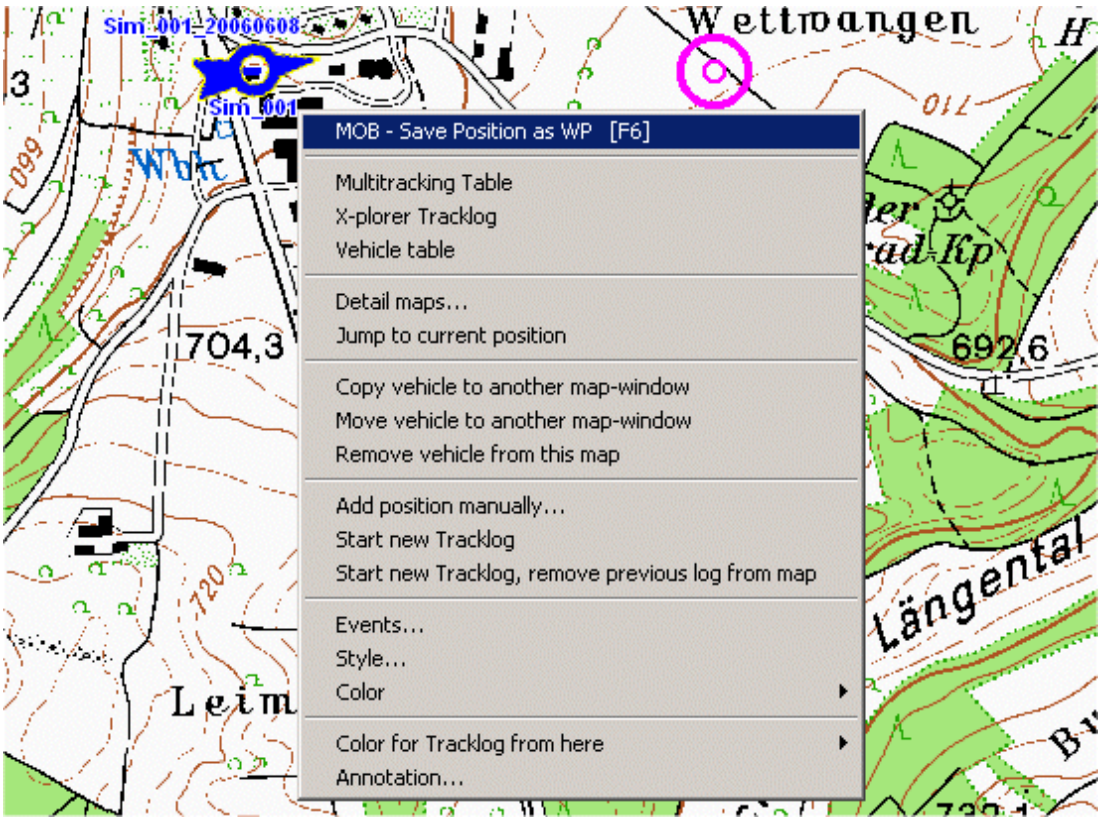
The change in the color range applies for all windows, i.e. for other applications too. When you close *QV* the original colorpalette will be re-established.
If this does not happen for any reason, for example after a program crash, right-click on the Windows desktop, select Properties , (alternatively, Start - Settings - Control panel - Display) choose the Appearance ticker, and select Windows Standard scheme (or the scheme that you prefer). *QV* will not modify any existing scheme.

This function is not available with all map types. ECW maps cannot be operated in the night screen.

Popup-Menu of vehicles

The Popup-Menu of a vehicle you can reach on several ways:

- Right mousebutton on the symbol of the vehicle in the map
- In Touchscreen-Mode left mousebutton on the symbol of the vehicle in the map
- Right mousebutton on the vehiclename in the Layer manager under **GPS-Online**.
- Right mousebutton on the vehiclename in the list of the Multitracking-Table.



MOB - Save Position as WP	Immediatly saves the current position as a WP. Also possible by pressing **F6.**
Multitracking Table	Opens the multitracking-table and marks the entry of this vehicle.
X-plorer Tracklog	Opens the X-plorer and marks the entry of the Tracklogs from this vehicle.
Vehicle table	Opens the X-plorer and marks the entry of the vehicle table from this vehicle.
Detail maps...	Show a list of all available maps from the current position. See also AutoMAP.
Jump to current position	Centers the current position in the map.
Copy vehicle to another map-window	Copy the mark of this vehicle to another mapwindow.
Move vehicle to another map-window	Moves the mark of this vehicle to another mapwindow
Remove vehicle from this map	Removes the mark of this vehicle from this map.
Add position manually...	Opens a dialog to manually enter a new position.
Start new Tracklog	Starts a new Tracklog. The current Tracklog remains visible in Map.

Start new Tracklog, remove previous log from map	Starts a new Tracklog. The current Tracklog will be removed from map, but of course remains in the database.
Events...	Opens the Event-Manager from this vehicle. You can change Actions and Events. See Events/Actions.
Style...	Opens the dialog Style to change visible attributes from position and tracklog. See Styles.
Color->	Quickly changes the color of the position symbol and the tracklog, without having to go through the style-dialog.
Color for Tracklog from here --->	Selects a new color for the tracklog from now on. With this you can make a rough classification of a trip while driving. E.g. green: beautiful landscape, orange:offroad etc.
Annotation...	Opens a small dialog-box to enter a annotation. This is a text, which will be stored in the info-field of the trackpoint from the current position.

Touchscreen GPS online mode

For the GPS online mode a new user interface is now available which will plot your map with maximum size (no window frame). All functions which are essential during driving are accessible through clear and transparent buttons. These buttons will pop-up when you touch the screen and will disappear after a while in order not to disturb the map plot.

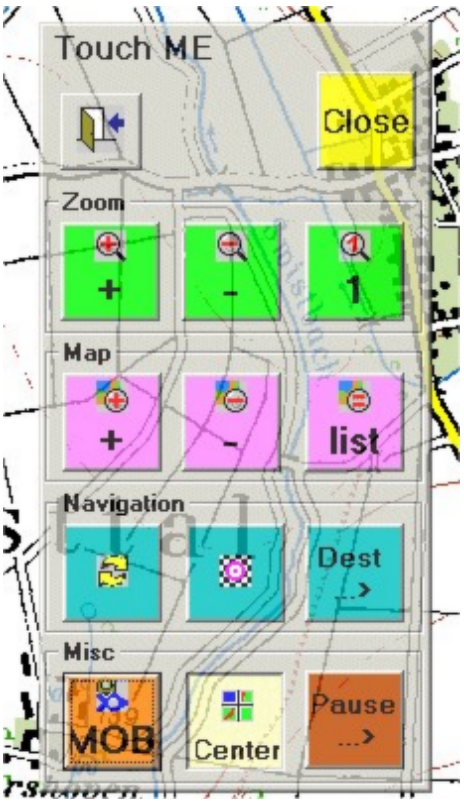
If your PC features a touchscreen, you can execute all commands without a mouse just by using your fingers.

You can activate this mode by clicking the icon or by selecting **GPS - Touchscreen-Mode** from the main menu bar.

All functions are controlled through the grey **Touch ME** window bar:

You can move this bar freely on your screen. It is transparent to avoid masking of important map details. If you touch this bar (or click on it with the mouse) it will pop-up and reveal a couple of functions. After 10 seconds without use, it will close again.

When opened, you will find all important functions for a quick access:



The door will close the Touchscreen mode and returns to the standard view.

Close closes the Touch Me window. This happens automatically after 10 seconds without use. You can alter this timer under Settings - GPS Online.

The green buttons enable zoom functions. **+** will zoom in, **-** will zoom out and **1** will resize to 100%.

The purple map buttons will open other maps. **+** will open a map with more details, **-** a map with less detail (overview) and **list** will open a list with all available maps.

: Recalculates the route to your current destination
: Defines a new destination.
Dest... >: Opens a separate submenu (see below).

: Identical to **F6**, saves actual position as waypoint.
: Identical to **space bar**, position will always be kept within the map window.
Pause ...>: Opens a separate submenu (see below).

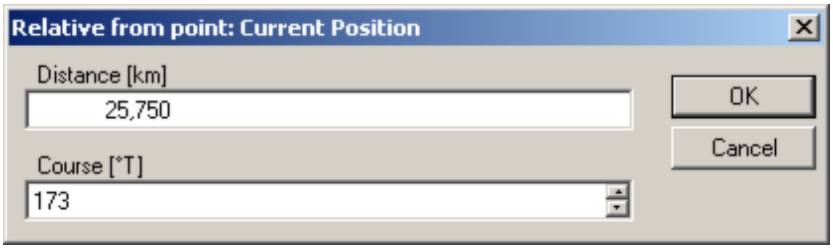
Navigation to destination

For this purpose the blue buttons are available:

Opens the *X-Plorer*. Without closing the Touchscreen mode you can quickly check the database, for example to search for a waypoint.

Opens the Search Window for example in order to search for an address which may be used as next destination.

Specifies a new destination through a distance and bearing from your actual position.

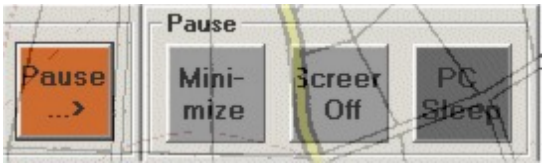


Deletes the actual destination

List Activates a list of recently used destinations in case you want to visit an earlier destination once again.

Pause

With these buttons you can interrupt the Touchscreen mode:



Minimize:
This button will minimize *QV* in order to access the Windows desktop. To re-activate the Touchscreen mode double-click on the *QV* icon in the windows task bar.

Screen Off:
This button will disable the screen. However *QV* will continue working. This function will save energy and your PC will look like being switched off. Ideal for a quick coffee break.

PC-Sleep
Switches the PC into stand-by mode.

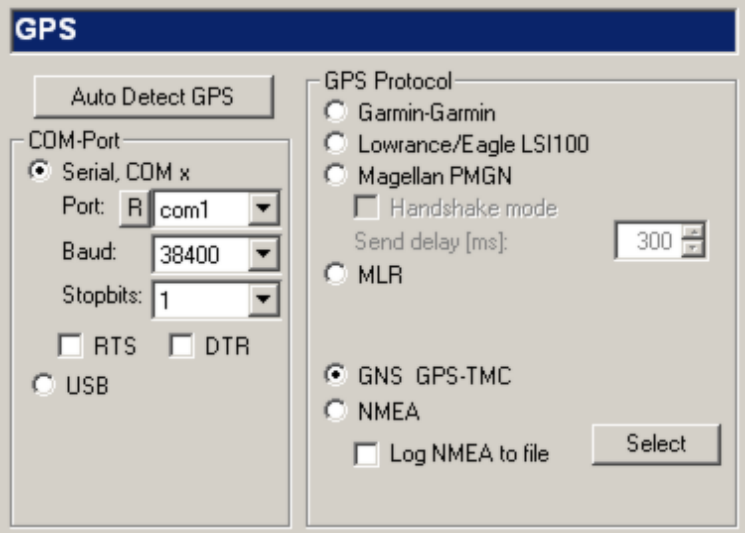
TMC - Traffic messages

In order to take advantage of traffic messages in the *QV* online mode, you require a special GPS receiver with integrated TMC decoder. Currently only the models of GNS are compatible with QV, the model GNS GPS RDS 9830 has been tested, however the models GNS 5840 GPS RDS Bluetooth and GNS 5843 GPS RDS TNC BC should also work.

To use this function in *QV*, you will have to install the GNS driver under your Windows operating system first.

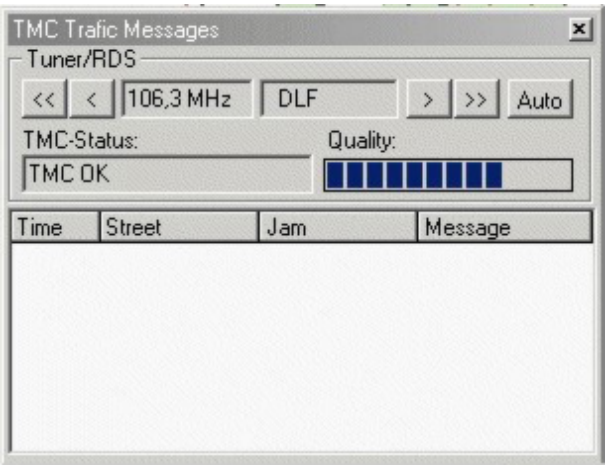
In *QV* you have to select the adequate **COM-port** and baudrate to which the GNS receiver is connected and the **GNS GPS-TMC** protocol under **Settings - GPS**.

Please note that the **Auto Detect GPS** function will not identify this special GPS mouse!



After the basic settings have been made, you can start the GPS Online mode.

In the GPS Online toolbox you can now activate the traffic info by clicking the icon. The *TMC traffic messages* window will open:



This is devided into two parts:

- The FM Tuner
- The list of traffic announcements and jams

If you like, you can dock the window to the lower or right-hand margin of the QV window.

FM Tuner

<<	Scan downwards
<	manual tuning downwards in 0.1 MHz increments
106.3 MHz	Indicates the actual frequency setting

DLF In this field the station name of the actually tuned frequency is listed

> manual tuning upwards in 0.1 MHz increments

>> Scan upwards

Auto If enabled, the tuner will automatically switch to another TMC station if the reception quality is insufficient.

TMC Status In this field **TMC OK** will be listed if a station with TMC support is tuned. Only when this is indicated, traffic announcements will be received and processed.

Searching TMC
The automatic scanning for a TMC station is currently active.

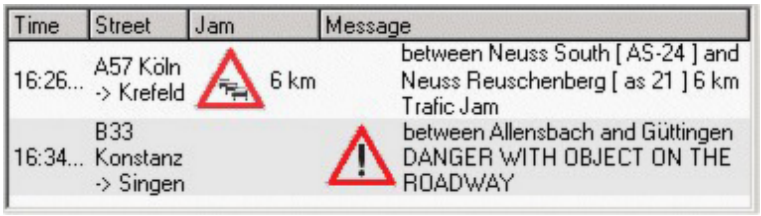
No TMC
No station with TMC support could be found. Please check the FM antenna of the GPS mouse.

No GMS found on 6/38400
No GPS mouse could be detected at the defined COM-port setting.

Please check the COM-port settings and the cable connection. Also check if you have installed the adequate driver for your GPS mouse. In case you use a Bluetooth mouse, you should also check related Bluetooth settings.

Quality This bar indicates the reception quality. For a good reception the bar should extend to about 50 to 70% of the scale or more. If the signal strenth is lower, please check the FM antenna cable. (In some areas reception quality may be that bad).

List of Traffic announcements and jams



This list contains all registered traffic announcements with:

Time Time of the message

Street The street ID, e.g. A57 or B27, and the direction of travel, e.g. *Köln* towards *Krefeld*

Jam If the traffic message relates to a jam, this is indicated by this icon and the length of the traffic jam is given.

Message A symbol, which relates to the type of hold-up precedes the complete message in plain text. The message will contain at least a location and the cause of the hold-up. Example: between *Allensbach and Güttingen DANGER WITH OBJECT ON THE ROADWAY.*

You can click on one of the four column titles and the table will be sorted according to this column.

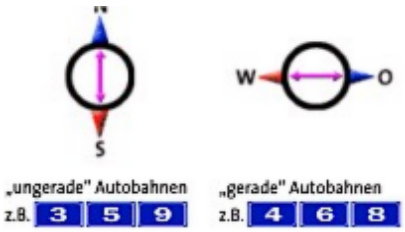
By default, the table is sorted according to time with the most recent messages at the top.

The content of this list is automatically updated. If any hold-up gets obsolete, it will be removed from the list. Of course, the actuality of this list is limited by the delay imposed by the police, traffic observers and the radio stations!

Map display

All messages are displayed as color-coded bold markings in the map which clearly indicate where traffic interference are currently taking place.

The color indicates the direction:



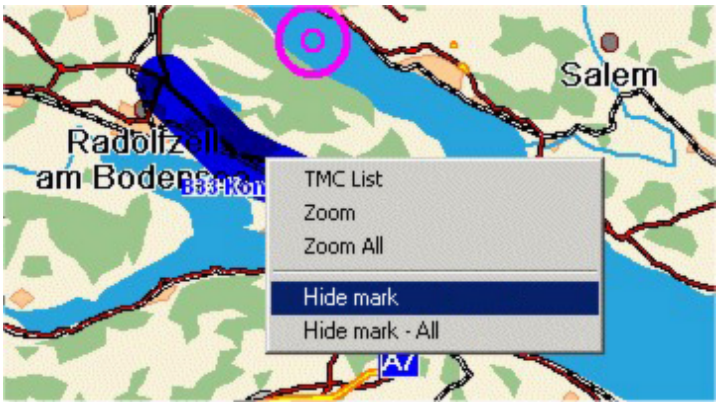
Odd street numbers are oriented in North-South direction, e.g. A81 or B33.
In this case blue will indicate an interference towards North and red towards South.
Even street numbers are oriented in East-West direction, e.g. A8 or B10.
In this case blue will indicate an interference towards East and red towards West.
purple marks code interference which affect both directions.

If you click on a specific entry with the mouse, QV will skip to the beginning of the interference (accounting for the direction) and will place the map cursor accordingly. An info box will summarize the traffic message, in the example shown below *"B33 Konstanz-Singen"*. Thus, also the text will indicate to which direction the interference applies and it will be easy to find another way (if you are not already stuck).

Tooltip

If you point with the mouse on a traffic interference marking, a tooltip window will pop-up listing the complete message.

Pop-up menu



After a right-click on a specific traffic interference marking a pop-up window with the following options will open:

TMC List	Skips to the related message in the TMC listing
Zoom	Zooms the map extent so that this specific traffic interference will be shown in maximum size.
Zoom All	Zooms the map extent so that all traffic interference will fit in the map window and be shown in maximum size.
Clear Marking	Removes this specific traffic interference marking from the map but not from the TMC listing. Another click in the TMC listing will replot the marking.
Clear all markings	Removes **all** traffic interference markings from the map but not from the TMC listing.

Tip: According to our experience, the FM antenna provided by GNS is not very powerful. We strongly recommend to connect the GPS mouse to the FM antenna of your car receiver using the provided T-splitter.

Autorouting with voice-guided navigation

This function only works with the GPS online mode.

If you have specified your target and the preferred routing preference (shortest or fastest way), QV will guide you to your target accordingly with voice-guided instructions on how to find the best way.

For this functionality our special Navteq-"Navi" maps are required.

Please note that this function will not be available before spring 2006. Presently this function is disabled.

As soon as available, details on this function will be included in an online help file which will be available for download.

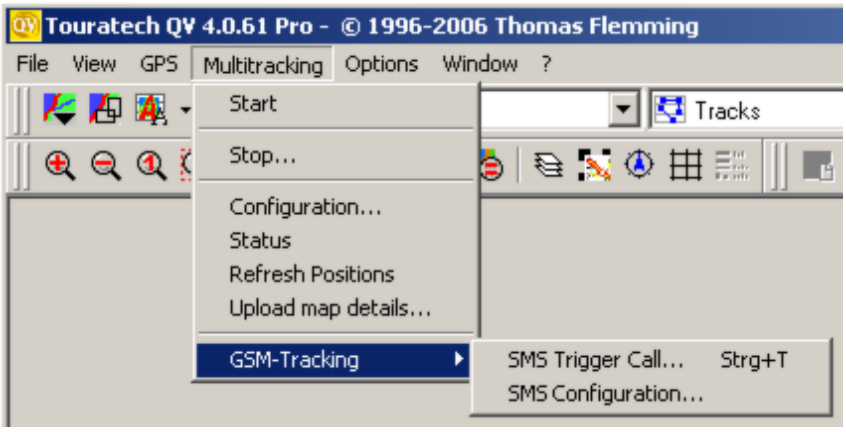
Multitracking
Multitracking

Multitracking with QV Professional / Power User

Multitracking means the remote tracking of vehicles and other objects with *QV*. The positions can be transferred by radio, cellular phone network (SMS or GPRS) or satellite and are fed into *QV* via several ports:

- Several ports can be checked and used simultaneously. For example, a GPS receiver can be directly connected via the serial or USB interface to show your own position while the position of other vehicles is received via radio and plotted in the same or a separate map.
- The maximum number of ports is not limited. You can specify as many ports and monitor as many vehicles as you like (assumed that your PC has the necessary resources).
- The positions of the Inmarsat-Transceivers DMR200 (*Satellite Tracker*) can be polled provided that you have acquired this unit from Touratech. This allows for a worldwide tracking of objects (except polar regions).
- Various Multitracking configurations can be created and saved.
- In the *X-Plorer* you can create one or more *Vehicle Tables* which may contain as many vehicles or objects as you need and feature user-definable columns. To track and monitor a certain group of vehicles you just store them in a *Vehicle Table* and start the multitracking from there.
- To visualize the positions of the vehicles and objects You can open up to 10 map windows. Each window can monitor one or more and also any subset of vehicles. A specific vehicle can also be tracked in several map windows.
- For testing purposes an NMEA emulator is available which can replay a stored NMEA logfile.
- Another function is available to automatically store screenshots of the map window in programmable intervals and upload them to a webserver. By this you can run QV at a central station where all positions are automatically collected and map clips are uploaded to a website while these webclips can be accessed worldwide by everybody through the internet.

All functions are summarized in the **Multitracking** pull-down menu of the main menu bar:

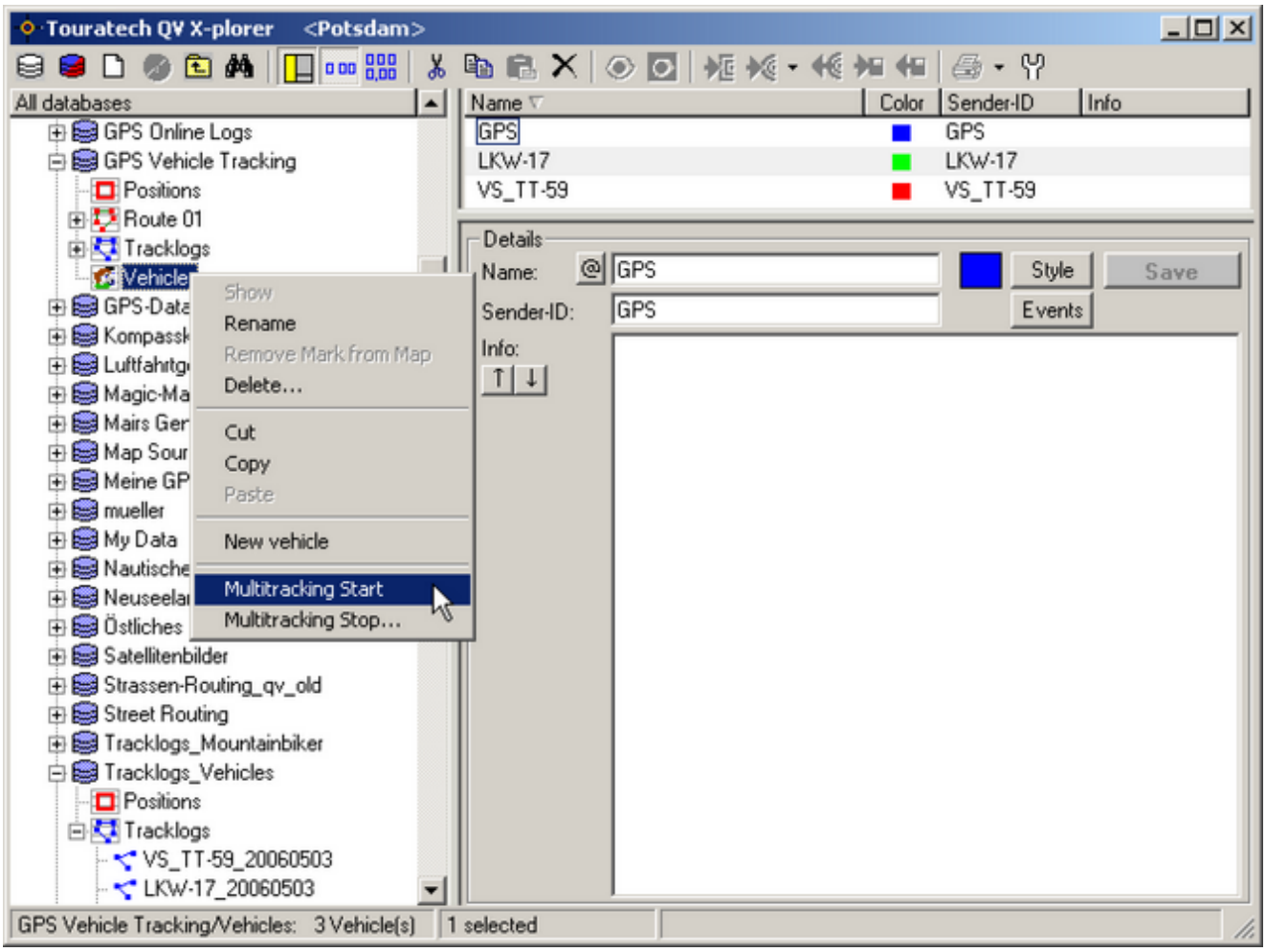


Start	F4	Starts the Multitracking.
Stop		Stops the Multitracking.
Configuration		Opens the dialog box for the configuration of the Multitracking ports. See Configuration.
Status		Opens a status window in which all incoming messages from all ports are listed.
Refresh Position		Polls an actual position from all configured units.

GSM-Tracking

SMS Trigger Call	Calls a GSM phone no. to poll a position download.
SMS Configuration	Opens a dialog box for sending an SMS message via a connected GSM modem. See SMS Configuration.

The **Start** and **Stop** commands can also be accessed through the pop-up menu of the *X-Plorer Vehicle Table*:



The Multitracking Table

Start:

After having all required parameters configured and all vehicle entries created you can start the multitracking by choosing the desired *Vehicle Table* and choose **Multitracking Start** from the Pop-up menu.

When starting the multitracking a new database is automatically created where all tracklogs will be stored. The default name of this database is *Tracklogs_vehicle-table-name*. Similar to normal online tracking you will find the tables for the tracklogs and positions in this database.

As an example, if you start the vehicle table *Touratech*, the tracklogs will be saved in the database

Tracklogs_Touratech.

Stop:

Choose **Multitracking Stop** from the Multitracking main menu.

Operation:
While the tracking is active you can control the positions in the *Multitracking Table*.

This table can be opened or closed with the switch in the GPS Online toolbox.
Furthermore you can stick the table to the top or button or let it float freely.

Multitracking Table

Name/ID	1	2	3	4	5	6	Speed	Course °	Altitude m	Position (WGS 84)	Time (MEZ/MESZ)	Message
AH-JB	✓						0	276	502	S 25.15417° O 132.37472°	04-08-06 11:28:05 / 12:28:05	04-08-06 19:36:24: ftp: ... new files processe...
59406938							0	143	1004	N 40.11222° O 33.02111 °	04-07-26 08:10:46 / 09:10:46	
		✓					74,0	171	1161	N 38.01222° O 32.51778 °	04-07-24 16:13:55 / 17:13:55	
59406928			✓				95,0	28	1994	S 22.81583° O 16.87167 °	04-07-25 11:54:15 / 12:54:15	
59406927				✓			35,0	245	136	N 33.11167° O 6.44306 °	04-08-06 18:09:35 / 19:09:35	
					✓		47,0	152	369	N 47.23333° O 24.43083 °	04-08-06 18:31:35 / 19:31:35	

The table lists every vehicle / object in a separate line.
The columns have the following meaning:

Name/ID ID of the vehicle or object as specified in the *Vehicle Table*.

1 2 3 The numbers represent the various map windows. Just tick-mark every map in which you want a specific vehicle to be plotted (see below).

Speed Actual speed. If not transmitted as a GPS measurement, this value is calculated from the distance traveled and the time interval between locations.

Course Actual heading. If not transmitted as a GPS measurement, this value is calculated from the change in location.

Altitude Actual altitude if available. Otherwise this value is set to 0.

Position Actual Position. Map reference is given in brackets (datum)

Time Time of the position fix. If not transferred with the GPS data, time reflects time of arrival in *QV*.

If *QV* is set to a different time zone as your Windows system, the time will be given with both references (references are given in the column header). A value given in brackets will specify the age of the position at the time of arrival (in hh:mm:ss). As in some cases data transfer may take quite a while this information can be important (for example with data from the *Satellite Tracker* or in cases of international roaming of SMS messages).

Message Messages such as errors from an FTP-Server or Timeouts, etc. You will find a complete list of such messages in the status window in the Multitracking main menu.

You can click to a column header in order to sort the table according to this column. A second click will sort in reverse order, a third click will disable the sorting criteria.

Several Map Windows
Multitracking and Multiplotting work perfectly together. This means that you can sample vehicles in the various map windows however you like.
This is implemented by means of the columns *1 2 3* etc. and the pop-up menu of the Multitracking table.
Together with the lines of the monitored vehicles the map window columns build a matrix where 3 options are possible for each field:

The vehicle / object will not be shown in this map window.

Click on this icon to copy and activate the plotting of this vehicle in this specific map window. The icon will then change to .
The vehicle / object will be plotted in this map window.

Clicking into the box will center the vehicle in the map and will change the icon to .

The vehicle will be plotted in this map window and will be centered in the middle of the map window. This means that the map will be centered with every new position of this vehicle.

Another click in the box will disable the centering function and the icon will change to .

Normally only one vehicle is centered in each map window. However, if you push and hold the Ctrl button you can activate the centering function for more than one vehicle in a map window.

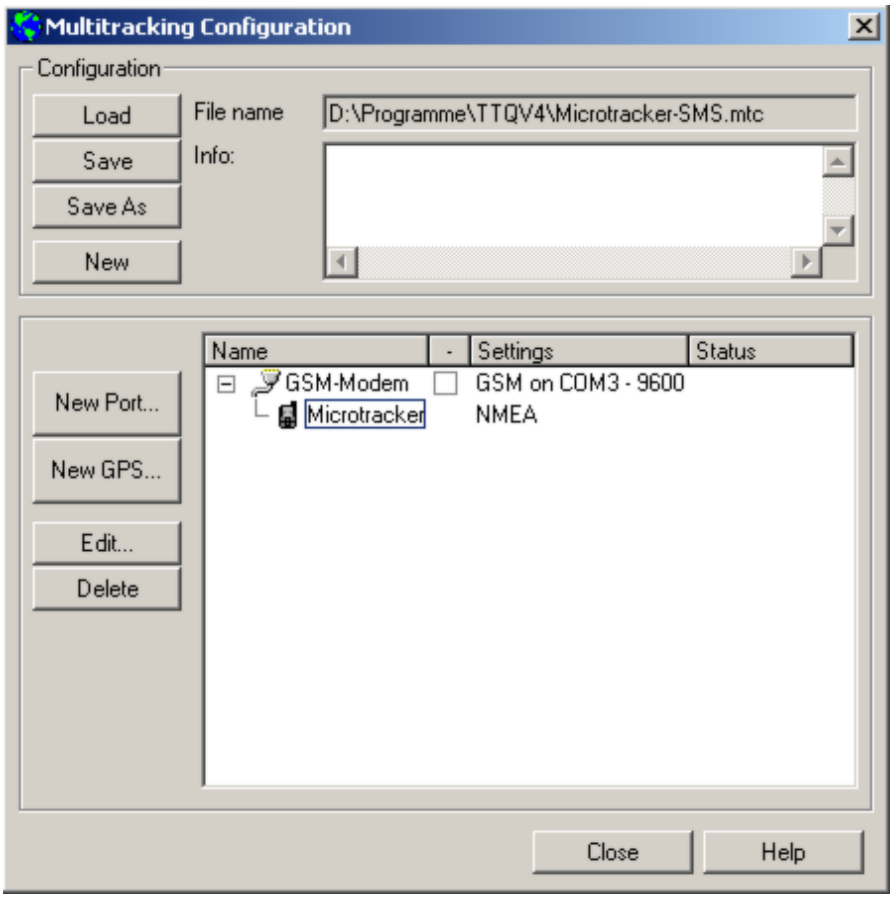
To delete a vehicle / object from a map window you have to choose **Clear Marking** from the pop-up menu of the *Multitracking Table*.

Pop-up menu

If you click with the right mouse button in the line of a specific vehicle or in the map window on the vehicle's symbol, the following pop-up menu will open. You can also access this menu by clicking on the vehicle's name in the layer manager. See Popup-Menu of vehicle.

Multitracking configuration

To open the multitracking dialog box choose **Multitracking - Configuration** from the main menu bar:



In this menu you can control the *QV* multitracking configuration.
You have the following options:

- Create a new configuration
- Modify an existing configuration
- Load and start a saved configuration

Load	Loads a configuration file which was created and stored earlier. Multitracking configuration files always end with a *.MTC extension.
File name	Indicates which configuration is currently loaded.
Info	In this field you can enter remarks for describing the configuration file.
Save	Stores the new or modified configuration file.
Save As	Stores the active configuration under a new name, i.e. a new configuration file will be created.
New	Creates a new multitracking configuration.

In the lower part of the window all details of the active configuration are listed.

New Port	Creates a new port entry and opens the Port Configuration dialog box.
New GPS	Creates a new GPS entry for the defined port and opens the GPS Configuration dialog box.
Edit	Opens a dialog box for specifying further details.

Delete Deletes a marked object.

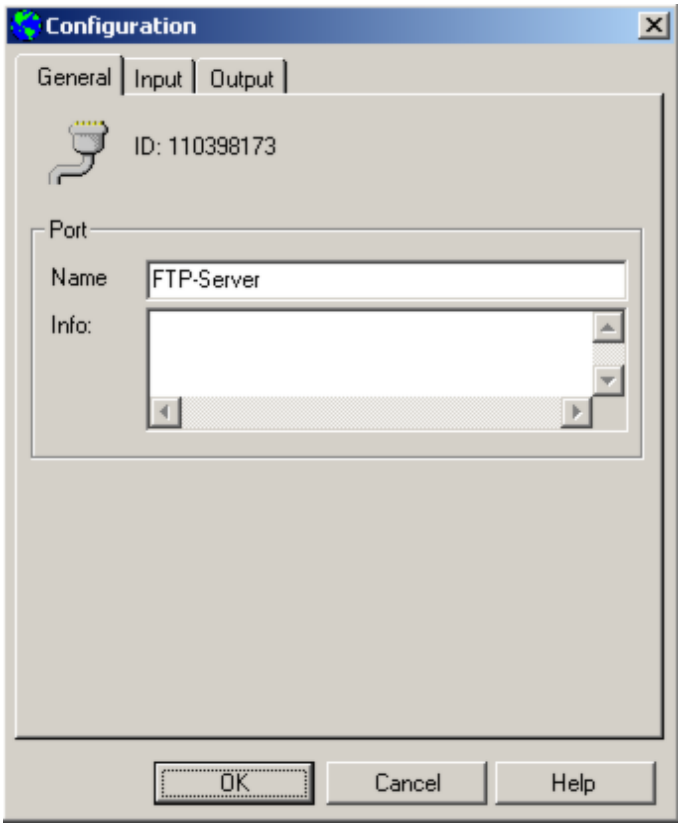
Note that a valid configuration must at least include one *Port* which defines through which path data are transferred (for example through a serial interface or a radio link) and a corresponding *GPS* protocol which defines the format convention of the data stream (e.g. NMEA or APRS).

You can define multiple ports. Some defaults are provided with QV which may serve examples:

Funk.mtc	For positions which are transferred through standard radio links and are encoded according to the *AGW Packet Engine* standard.
Dmr200.mtc	For data from a *Satellite Tracker* / Skywave DMR 200 Inmarsat transceiver.
seriell_funk.mtc	For two channel operation with positions transferred by radio in the *AGW Packet Engine* standard and another locally connected GPS unit through the COM port for indicating your own position.

Port configuration

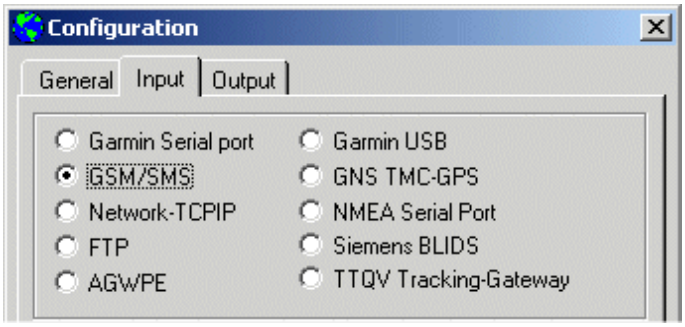
General



Specify a port name here. Optionally you can add a description in the Info field.

Input

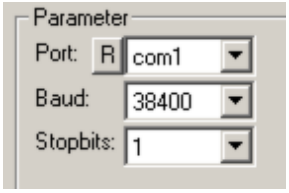
On the Input Tab you have to specify the communication link and format.



Each communication link may require the definition of specific parameters:

Garmin Serial, NMEA Serial, GNS TMC-GPS

Choose one of these ports if you use a locally connected GPS unit:



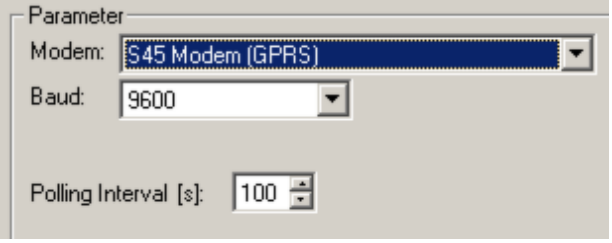
Specify the serial parameters accordingly.

Garmin USB

Choose this port if you have a Garmin receiver connected via USB. No additional parameters are required.

GSM/SMS

This port will check a locally connected GSM modem or a mobile phone connected through a PC interface cable for SMS position messages in user-definable polling intervals.



Choose your GSM modem from the list and specify a suitable baud rate. Please note that the modem must be installed to your *Windows Hardware Manger* beforehand.

The polling interval defines, in which time intervals the modem will be checked for new SMS messages.

QV will read all SMS messages and will automatically identify positions. Valid positions will be processed together with the incoming phone no. for sender identification. These processed SMS messages will the be deleted from the internal modem / mobile phone memory, all others will be left unchanged.

QV can interpret SMS the following SMS location messages: plain text messages with coordinates in degrees in standard notification, special positions SMS messages sent by Thuraya, Garmin Navtalk and Benefon satellite and mobile phones and all SMS messages containing standard NMEA sentences.

The simplest option would be to send a text SMS only containing the coordinates:

N51,234 O7,3242

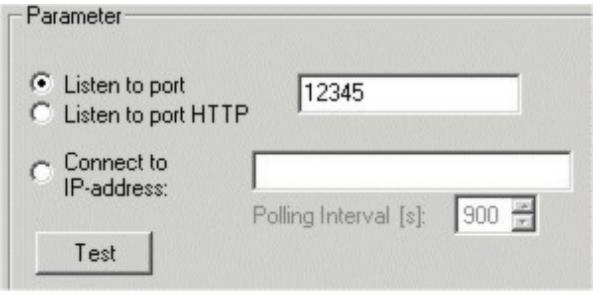
That's all!

Please also refer to SMS Trigger call and SMS Configuration.

Network TCPIP

Choose this option to receive positions forwarded through a network using the TCP protocol.

Three options are available:



Listen to port:

Specify a port no. and another application can then connect via TCP socket to this specific IP address / port and transfer data.

Listen to Port HTTP:

Specify a port no. and another application can then connect via TCP socket to this specific IP address / port and transfer data. This option has been specially designed for specific GPRS hardware units such as the *Microtracker GPRS* / *WebTracker* in order to connect to a specific webserver.

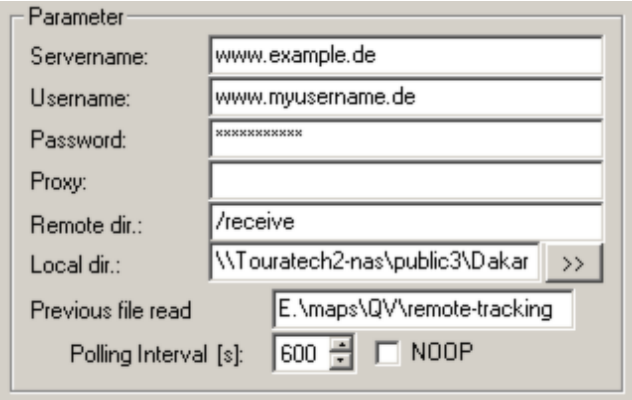
Connect to IP-Address:

This is the reverse function to **Listen to port.** Another PC in listen mode will respond to *QV* requests and will send data after a successful connect. You can specify a polling interval in order to define the time interval in which *QV* will connect the corresponding port.

Test:

With this button you can open a Log window. *QV* will then try to establish a TCP connection according to the specified parameters. Thus you can quickly check if a connection using this parameters works.

FTP



This port has to be configured when using the *Satellite Tracker / Skywave DMR200*. In this case location data have to be downloaded as individual files from a specific server through an FTP file transfer. The polling interval will define the time interval in which the files will be downloaded for further processing.

For this option a stable internet connection is required. Depending on the pricing of your internet provider costs will vary remarkably. So be advised to choose a volume based price model or a flat rate. In any case you should avoid time-based price models like ISDN or analog modem connections. With the *Skywave DMR200* modules, the related amount of data is approx. 300 bytes per position.

Server name, User name, Password, Remote directory

If you rent a *Satellite Tracker / Skywave DMR200* through Touratech, we will forward this information to your attention together with the hardware.

Local directory

Specify a local directory on your PC, in which the downloaded positions will be stored in raw format.

If you leave the directory empty, the default will be *Tracking_tmp* in your *QV* directory.

Polling Interval

Time interval for polling request to the remote FTP server in seconds.

NOOP

If enabled, *QV* will send the *NOOP* command to the server every 20 seconds. This prevents remote server disconnection due to inactivity. However, *QV* will automatically reconnect if a connection should be interrupted.

Previous file read

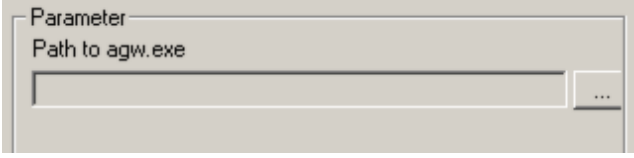
In this field the name of the file which has been read last is indicated. These files have the following name convention:

yyyymmdd-hhmmss.rx

where yyyymmdd codes the date, followed by the delimiter sign "-" and the time. *QV* will automatically read younger files only after a reconnect.

In case you want to download older files once again, specify an older time in the file name to reload these older files.

AGWPE



The AGWPE port has been designed for a communication with the *AGW Packet Engine* and *AGW Packet Engine Pro* software packages. These software packages allows for a decoding of radio signals with encoded GPS positions through the audio input of your soundcard. These software application will run continuously in the background and forwards the positions through an internal interface to *QV*.

The *AGW Packet Engine* is "free for use only by Radio Amateurs in Radio Amateur Stations". However, we recommend *AGW Packet Engine Pro* due to its increased performance. Both software packages are available at the following homepage: http://www.elcom.gr/sv2agw/pepro.htm

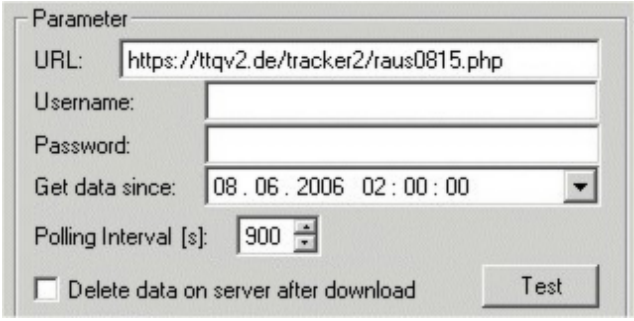
Path to the agw.exe file

Please specify here where the *AGW Packet Engine* program file is located on you PC. *QV* will then start it automatically.

If you leave this field empty, you will have to start the program manually.

Please note that you have to configure the AGWPE software according to your radio hardware requirements! This is described in the AGWPE documentation. Please check if the correct decoding of the GPS positions using the monitor function of the AGWPE software. If the decoding does not work properly, *QV* will not be able to process the data and indicate positions of the remote target on the map!

TTQV Tracking Gateway



Request positions from the TTQV Tracking gateway.

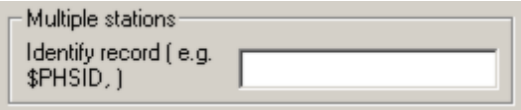
URL, **Username** and **password**: enter your account data here as provided by us to you. This gives you access to the data of your tracking-unit(s).

Get data since: normally QV only gets positions that are new since the last time, QV looks for data. It may be necessary to get older data once more. If so, enter here the desired start date/time, from which you want to load all positions.

Polling interval: Selects the interval in which QV looks on the gateway for data

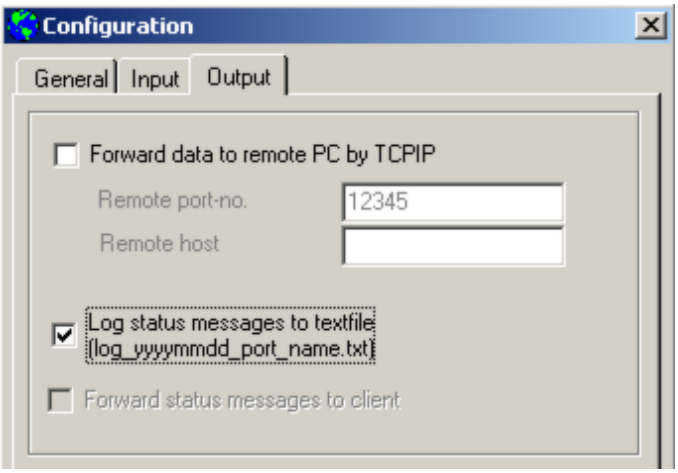
Delete data on server after download: When this is checked, the server deletes all positions from its database once they are downloaded to QV. Of course, they are then stored in QV.

Multiple stations



You can specify a sentence here which will be interpreted by *QV* as sender ID. See Sender ID.

Output



On this tab you can specify if data are to be forwarded to another TCPIP address.

Forward data to a remote PC by TCPIP

If enabled, *QV* will forward the positions through the network (Internet or Intranet) to the TCP address

Remote host and to the port *Remote port. no.* Using this function GPS positions can be forwarded to another *QV* installation on a remote PC.

Currently this function only works with NMEA data. Thus, the remote PC must be able to process data in the NMEA format.

Logging status messages into textfile

If enabled, QV will create a textfile named *log_yyyymmdd_port_name.txt* in the *Tracking_tmp* directory (within the *QV* main directory) containing all status messages.

Configuration of the GPS protocol

After defining a port, a new GPS connection will automatically be created. There you have to define in which format the GPS data are delivered.

Theoretically, you can define several GPS connection for each port. However, we strongly recommend to restrict each port to a single GPS connection.

General

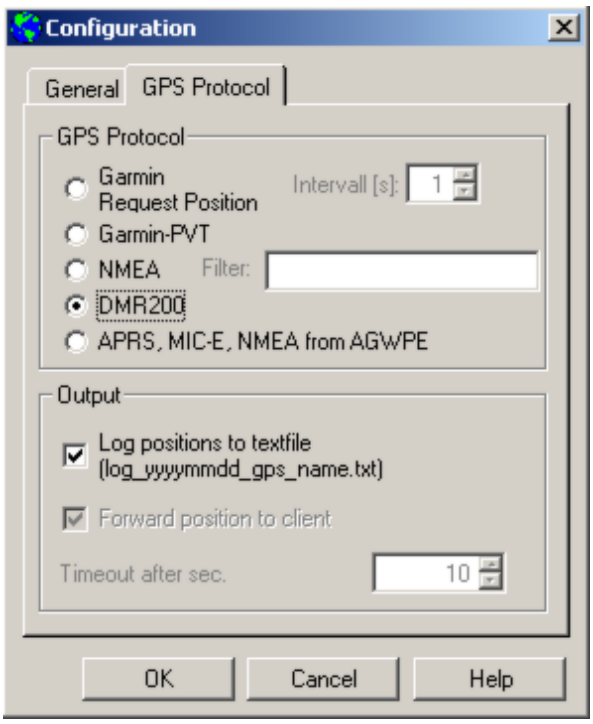
Please define in this dialog box under the *General* tab at least a GPS *Name* and optionally also a description for easy identification in the *Info* field.

The multitracking connection will be listed under the defined name.

If the sending hardware unit does not imply a unique Sender ID, this name will later on be compared with the *Sender ID* as defined in the vehicle table for an identification of the sender. See also chapter *Sender ID*.

GPS Protocol

In the dialog box of the *GPS Protocol* tab you have to choose the GPS protocol and corresponding parameters.



Garmin Request Position

This is for older Garmin units like the GPS 75 which do not support the PVT mode. In this case *QV* will poll positions in regular intervals. Please specify the time interval in seconds. Only a serial port (COM) is possible for this option.

Garmin-PVT

This setting is recommended for most GARMIN units (except the very old ones). The GPS units will send a complete position data set every second. A serial (COM) or a USB port are possible for this option.

NMEA

This setting is adequate for all GPS units using the standard NMEA protocol. This option is possible with the following port settings: Serial (COM), GSM/SMS or Network-TCPIP.

QV can interpret the following NMEA sentences:

Garmin	$PGRME
General	$GPWPL, which is used for transfering the actual position, the waypoint name is used as a label for the *Sender ID*.
	$GPRMC, $SDDPT, $GPGGA, $GPGLL, $GPGSA, $GPGSV, $GPVTG
QV special	See chapter NMEA over TCP

In the *Filter* field you can enter a string in order to filter for certain data sets. If you leave this field empty, all sentences will be processed. If you enter $GPGSA,$GPGSV in this field, only the *GSA* and *GSV* will be processed. All others will be rejected.

DMR200

For position data sets which follow the format standard of DMR200 *.RX files (*Satellite Tracker* / Skywave Inmarsat transceivers)

Only possible with an FTP port setting.

APRS, MIC-E, NMEA from AGWPE

This is for positions received through a radio link which are forwarded to *QV* through the AGW

Packet Engine.
Such data can have an APRS-, MIC-E- or NMEA format.
This option is only possible for an AGWPE port setting.

Output

This tab offers two options:

Forward data to remote PC by TCPIP:
With this option received positions can automatically be forwarded through the Internet.
Specify a *Remote port no*. and the *Remote host name*.

Log status messages to textfile:
This option will create a textfile named *log_yyyymmdd_gps_name.txt* in the subdirectory *Tracking_tmp* of the *QV* main directory where all positions will be logged.

Sender ID

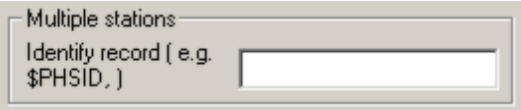
An important point in multitracking applications is a unique assignment of positions to specific cars. The sender ID is used as label for this purpose and can be defined manually in the configuration of the GPS protocol in the *Name* field. If a unique assignment is already guaranteed by the sender or port characteristics, the defined GPS name will be ignored.

These are the related options:

GSM/SMS	The SIM-card phone no. of the sender is used as Sender ID.
FTP, DMR200	The internal serial no. of a DMR 200 C/D/L unit will be used as Sender ID. When renting or buying such a unit you will receive this no.
AGWPE	The amateur radio identification code of the transmitting radio will be used as Sender-ID.
Serial port COMx	If a GPS unit is connected to a serial port, normally no ID is available. In this case, the defined name from the GPS configuration will be used as Sender ID. In some cases ID headers may be implemented in the NMEA data stream which may be used alternatively as Sender ID.
Network TCP	In this case an identification is also not possible. The defined name from the GPS configuration will be used as Sender ID. Again, ID headers may be implemented in the NMEA data stream which may be used alternatively as Sender ID.

For identifying a vehicle or monitored object, these Sender IDs will be compared with the Sender IDs as defined in the active *Vehicle Table*. See chapter Vehicle Table.

For special cases a data entry box is available for serial and TCP port configurations using NMEA protocols:



In this box, a special NMEA sentence can be defined which will be used by *QV* for defining the Sender ID.
By this, data of multiple vehicles can be included in a NMEA data stream. In this case it is essential that the sender of the NMEA data stream will transmit this NMEA ID sentence whenever the sender changes.

An example for clarification:

Defined ID for identification purposes: **$PHSID,**
QV will then search in the NMEA data stream for a sentence beginning with the string "**$PHSID,"** . If this is identified, all characters and digits which follow in this line will be used as Sender ID. This sender ID will be valid as long as another identification string is detected.

So, "$PHSID,GL-QV1*XX" will belong to the vehicle with the Sender ID *GL-QV1* (*XX is the NMEA Checksum). All following sentences will be assigned to this specific vehicle until another Sender ID is received.

Concerning the special "$QVxxx" sentences this procedure is obsolete because in the *$QVxxx* sentence the Sender IDs is implemented. For more details refer to the chapter NMEA over TCP.

Unknown Vehicles

Normally you will first define a vehicle or monitored object in the Vehicle Table and then start multitracking. However it might be the case that you missed to define a vehicle or that positions of a foreign vehicle are interfering.

A software switch titled *Track only known vehicles* under **Options - Settings - GPS - Advanced** is available for this purpose and will define how such data are processed:

Enabled:

Data from an unknown vehicle will be ignored.

Disabled:

A new entry will be created in the standard vehicle table in the *GPS-Online Logs* database and the sender ID will be notified.

You can move the vehicle / monitored object from there to the *vehicle table* of your choice.

SMS configuration

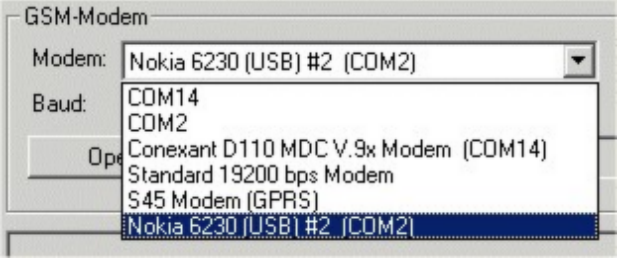
This function allows for a sending and receiving of SMS messages through a local GSM modem. This function can be used for configuring our *Microtracker* models or to send standard SMS text messages.

Basically you can use any GSM modem or mobile phone which features a suitable cable, a Bluetooth or IR interface and can be configured as a modem in your Windows operating system. Please follow the instructions given in the manual of your GSM modem or mobile phone for a setup under Windows.

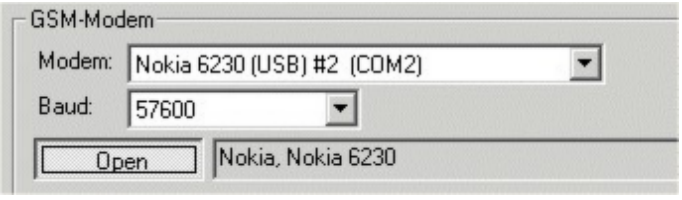
Configuration Settings

To configure the SMS module of *QV* you have to choose **GSM-Tracking - SMS-configuration** under **Multitracking** of the main menu bar.

First of all, you have to choose the modem model from the pull-down list:



Click **Open** to activate the modem connection. If this command has been successfully executed, the modem name and type will be listed in the field to the right:



Downloading SMS messages from the modem

Load all SMS This function will download all SMS messages from the memory (ME,SM or MT; see below) and will list them in the window. The messages will not be deleted in your modem / mobile phone.

SMS Memory Specifies the memory type from which the SMS messages will be downloaded or deleted:
ME: Modem memory
SM: SIM-card memory
MT: Both memory types
Note that not all modems / mobile phones will support all options.

Delete all SMS in Phone... This function will delete all SMS messages from the specified memory type (see above).

Clear Clears the message window.
Tip: You can also copy the text to the clipboard using *Ctrl-C* for further use (mark-copy and paste).

Sending SMS messages

Phone Specify in this field the mobile phone no. of the receiver.

SMS Text Enter your text message in this field. You can also insert text from the clipboard. String length is restricted to 169 characters.

Send SMS This button will trigger the SMS transfer. You can follow the status of transmission in a status window.

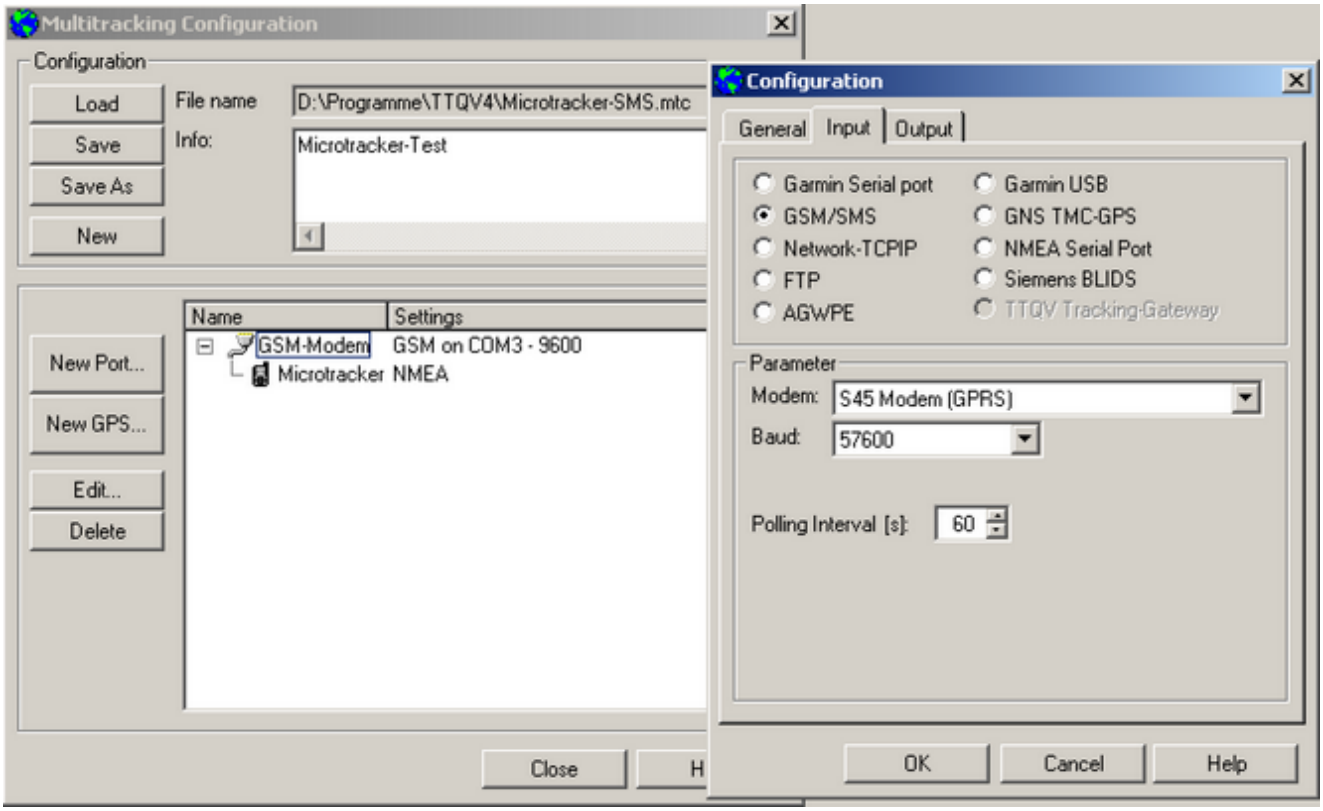
Clear Clears the window.
Tip: You can also copy the text to the clipboard using *Ctrl-C* for further use (mark-copy and paste).

SMS Trigger call

Using this function you can trigger a phone call to a specific telephone number in regular time intervals through a configured GSM modem. This can be used in order to poll SMS position messages from specific hardware components such as the *Microtracker*.

Please note that this functionality requires the definition of a *multitracking configuration* where a corresponding GSM/SMS port has to be specified.

Basically *QV* will wait for an incoming SMS messages every x seconds (as specified as polling interval). Thus, *QV* will be depending on position uploads from the corresponding hardware unit.

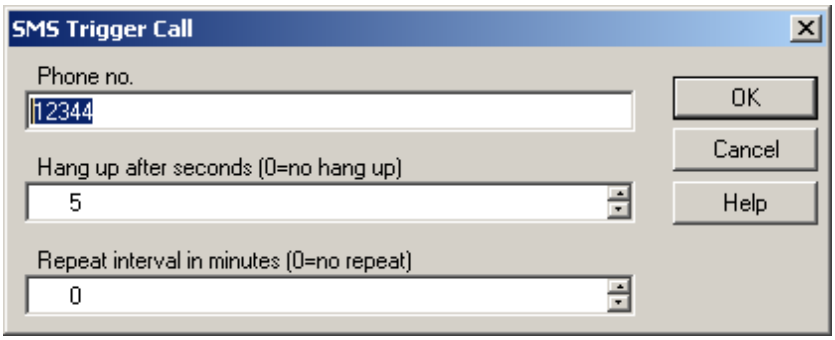


However, in various occasions it might be preferable not to program the hardware unit for automatic downloads in specific intervals but execute a polling command. This can be done using the trigger call function which will just dial the specified phone no. and then hang up. Some hardware units like the *Microtracker* will respond to such a trigger call by an immediate SMS position upload to the calling phone no.

Please note that only specific hardware components like the *Microtracker* and the *Webtrack* support this functionality.

It is also essential for this function that the connected GSM modem supports a phone no. ID forwarding!

The following *SMS Trigger Call Parameters* are available:



Phone no.	Phone no. of the hardware unit which should be addressed in order to poll an SMS position download.
Hang up after sec.	Maximum time period for ringing. *QV* will ring as long as specified and hang up thereafter. If you specify *"0"*, QV will not hang up and the connection will be established as long as the corresponding hardware unit won't hang up.
Repeat interval	Specify an interval in minutes here, in which *QV* should repeat the Trigger Call. If you specify *"0"* the trigger call will not be repeated.

Important note: The Trigger Call will poll a SMS position upload to the GSM modem which is connected to your PC.
To get this position plotted in *QV*, a suitable polling interval must be specified in the multitracking configuration. Otherwise the position will not be processed in *QV*.

Vehicle table

The vehicle table lists all vehicles or objects which are remotely monitored.

The ID of the sender will be used to label the incoming positions and tracks. You can define as many vehicles / objects as you like and activate them for a remote tracking. However, this function is only supported by the *Power User* and *Professional* versions of *QV*. While *QV Power user* is restricted to non-commercial applications and a maximum of 5 vehicles / objects, *QV Professional* is the version for commercial applications and can monitor as many vehicles / objects as required. This will require as many *multitracking options* as vehicles / objects are to be remotely monitored (1 vehicle is included in *QV Professional*).

Each vehicle / object contains at least 4 data fields:

- Name User-specified name which is used as label in the map and in the multitracking table.
- Color/Style Defines the color and the symbol for indicating the position in the map.
- Sender-ID This ID will be compared with incoming positions for identifying the sender. For this purpose, specify the Sender-ID in this field.
- Info User-definable optional entry.

Additionally you can define as many columns as you like for adding further information such as address, competitor-ID, marking label, etc.

You can also import a textfile which will have to follow this convention: first line with column names followed by one line for each vehicle and fields delimited by tabs, comas or semicolons.

Creating Vehicle Tables

- Select **New Vehicle Table** from the pop-up menu of any database in the *X-Plorer*.
- Select the additional columns (if required) in the following window or click **OK** if you do not need additional columns.
- You can also use the **Import Textfile** function to choose and import a text file.

Adding a new vehicle:

- Select a **New Vehicle** from the pop-up menu of a vehicle table.

Edit vehicles and objects:

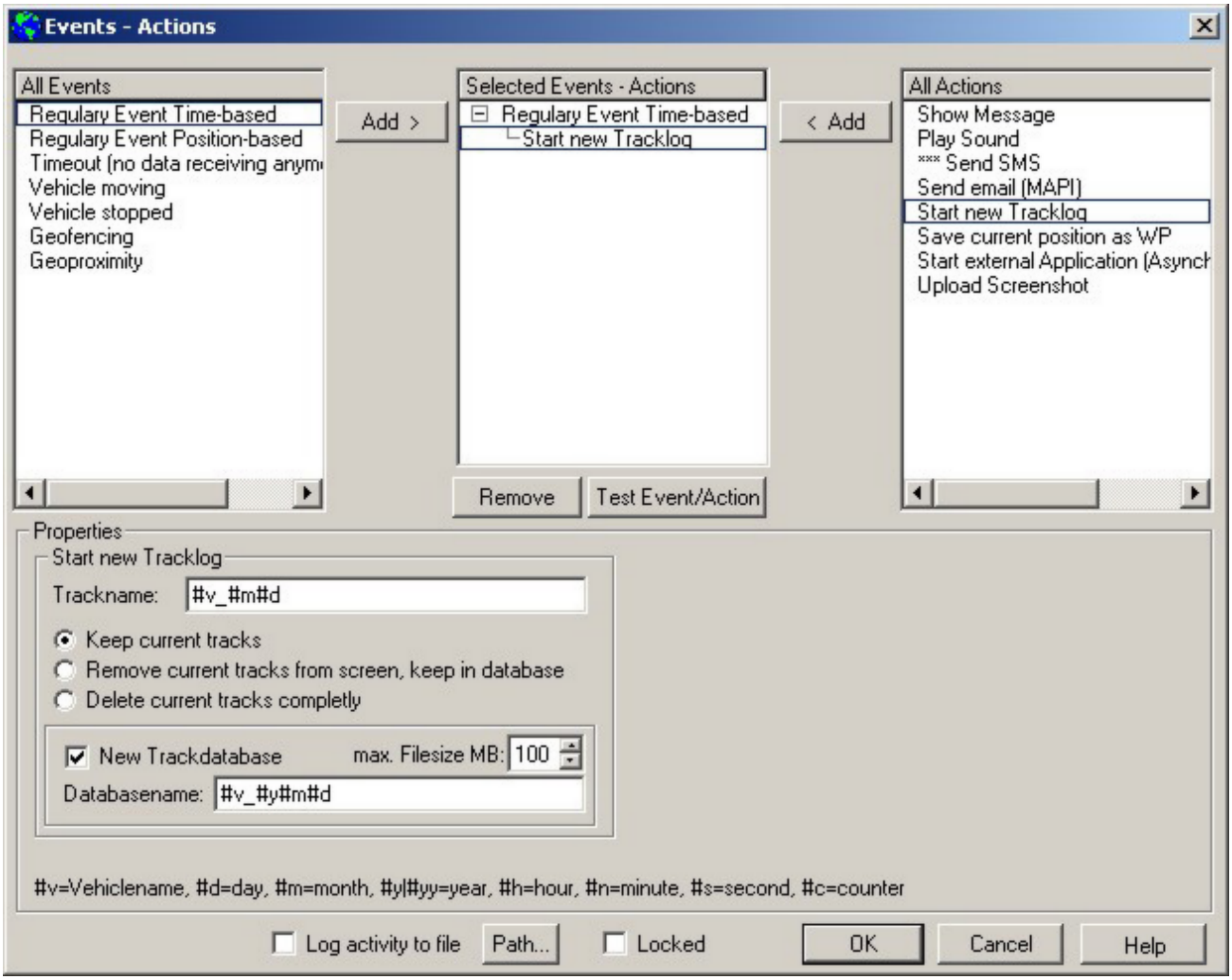
- *Name, style, sender ID* and *info* can be edited in the *X-Plorer Detail Window* and be confirmed with **Save**.
- All additional columns can only be edited in the table by selecting **Edit Cell** from the pop-up menu. You can perform the editing similar as in *Excel*.

With the *Event function* you can define specific events and link them with user-definable actions to be taken for an individual car(s).

Vehicle-specific events and corresponding actions

In Multitracking operation, you may define as many "actions" as you like which will be automatically monitored. Each event can trigger a specific action.

All corresponding configurations a done in the **Events-Actions** dialog box which can be accessed either through **Events** from the pop-up menu after a right-mouse click during online monitoring or by selecting **Events** from the *vehicle table* in the *X-Plorer*:



First of all You have to select an event from the list to the left of this window. This defines the event type to be monitored.

By clicking **Add >** this event will be added to the *Selected Events - Actions* list in the center of the window.

Mark a specific entry and enter all parameters for this event in the field **Properties** at the lower part of the *Events-Actions* dialog box.

Finally, the corresponding actions are defined by assigning a corresponding action from the list to the right of this window. Finish your entry by clicking **<Add**. The action will then be listed below the event in the *Selected Events - Actions* list. Now mark the action in this list by a left-mouse click and define all parameters.

Repeat this procedure for all events and actions.

You can test a specific event and the corresponding action by clicking the **Test Event/Action** button after marking the entry in the list.

Entries which are not longer needed can be deleted by clicking the **Remove** button.

Searching for errors

If you start Multitracking and nothing happens, please check the following points:

Did you run **Multitracking-Start** from the adequate *Vehicle Table*? Are all vehicles / objects listed in the *Vehicle Table* with the correct ID?

If no Multitracking Table is visible, click on the icon in the *GPS Online* toolbox.
For this purpose select **View - Toolbars - GPS Online**.

Open the *Log Console* by selecting **Multitracking - Status** from the main menu bar.
For example, a functioning FTP connection to a Server should look similar to this:

2004-05-13 11:10:06 ftp: connect to 62.112.147.53 ...
2004-05-13 11:10:16 ftp: 331 Password required for vwracing.
2004-05-13 11:10:16 ftp: 230 User vwracing logged in.
2004-05-13 11:10:16 ftp: 257 "/" is current directory.
2004-05-13 11:10:16 ftp: 200 Type set to I.
2004-05-13 11:10:16 ftp: 250 CWD command successful.
2004-05-13 11:10:17 ftp: StartPort ...

If you will see only the first line, you are facing a network problem. Check in this case if you can establish an Internet connection on your system at all, for example with the Windows Internet Explorer.

If positions are downloaded correctly, the listing should look like this:

2004-05-13 11:10:17 ftp: check_for_new_files ...
2004-05-13 11:10:17 ftp: 200 Type set to A.
2004-05-13 11:10:17 ftp: 200 PORT command successful.
2004-05-13 11:10:17 ftp: 150 Opening ASCII mode data connection for file list.
2004-05-13 11:10:17 ftp: 226 Transfer complete. Quotas off
2004-05-13 11:10:17 ftp: 200 Type set to I.
2004-05-13 11:10:17 ftp: downloading from /receive/ ->
E:\karten\QV\Qv30\qvTracking\tracking_tmp\
2004-05-13 11:10:17 ftp: ok: 20040512-094214.RX
2004-05-13 11:10:18 ftp: ok: 20040512-094414.RX
2004-05-13 11:10:18 ftp: ok: 20040512-094814.RX
2004-05-13 11:10:18 ftp: ok: 20040512-095514.RX
2004-05-13 11:10:21 ftp: ... new files processed: 4, next check in 120 sec

If still nothing is plotted in your map window, check the *Multitracking Table*:
You should find one line for each vehicle / object with a position entry.
Has a tick-mark been set in column 1 where you enable the plotting in a map? You should see a box with a icon (uncentered plot) or a icon (centered plot). If not, click in this field in order to enable the plot-in-map function.

NMEA over TCP

Special NMEA-commands recognized by TTQV in GPS Online Mode.

These commands can be used like any other NMEA-records. They can be send to QV over all available ports, e.g. serial, over TCP, etc.

$QVPOS

```
complete Position
available in QV Light, QV Standard, Power User and QV Professional.

e.g. with Sender ID:
    $QVPOS,xyz,0,170804,121500,50.55947,7.11563,50.1,180,1234*64
e.g. without Sender ID:
    $QVPOS,,0,170804,121500,50.55947,7.11563,50,180,1234*64

Field Number, fields separated by COMMA:
 0) $QVPOS
 1) Sender ID   String, Name of sender, if present,
                will be used as Sender_ID in QV
 2) Status      Number, currently always 0
 3) UTC Date    ddmmyy
 4) UTC Time    hhmmss.s
 5) Latitude    decimal wgs84, south is negative
 6) Longitude   decimal wgs84, west is negative
 7) Speed       KM/h
 8) Course      True course, Degree
 9) Altitude    Meter
 ...            additional field may come in the future
 *XX            NMEA-Checksum
```

$QVMESS

```
Message
available only in  QV Pro, at least 3.0.112

e.g.  $QVMESS,xyz,0,1,,this is a message*64   with Sender ID
e.g.  $QVMESS,,0,1,,this is a message*64      without Sender ID

Field Number, fields separated by COMMA:
 0) $QVMESS
 1) Sender ID    String, Name of sender, if present,
                 will be used as Sender_ID in QV
 2) Status       Number, currently always 0
 3) Messagetype  see table below
 4) Messagedata  ASCII-Text with additional data to the message,
                 depending on Messagetype
 5) Messagetext  ASCII-Text, no commas no * no cr-lf
 ...             additional field may come in the future
 *XX             NMEA-Checksum
```

The following messages are currently defined:

General Messages			
Description	**Messagetype**	**Messagedata**	**Messagetext**
Clear previous message	1		

Show messagetext in statusfield	2		any

Messagetype 10000-10010 for Falcom-Stepp-modul:			
Description	**Messagetype**	**Messagedata**	**Messagetext**
Complete Status	10000	All 5 fields from the original Falcom $GPIOP record, without GPIOP	None
Digital input 1	10001	0 or 1	Alarmtext as defined in TraxxerMGR
Digital input 2	10002	0 or 1	Alarmtext as defined in TraxxerMGR
Digital input 3	10003	0 or 1	Alarmtext as defined in TraxxerMGR
Digital input 4	10004	0 or 1	Alarmtext as defined in TraxxerMGR
Analog input 1	10005	value_is#value_min#value_max	Alarmtext as defined in TraxxerMGR
Analog input 2	10006	value_is#value_min#value_max	Alarmtext as defined in TraxxerMGR
Geofencing alarm	10007		Alarmtext as defined in TraxxerMGR
Ignition Alarm	10008	value	Alarmtext as defined in TraxxerMGR
Battery Alarm	10009	value	Alarmtext as defined in TraxxerMGR
No carrier	10100	"No Carrier"	

The following commands will be send from QV to TraxxerMGR to set the digital ports of the Stepp **(QV4 only)**			
Set Digital Output 1	10011	0 or 1	1=sms 2=serial 3=dataconnection
Set Digital Output 1	10012	0 or 1	1=sms 2=serial 3=dataconnection
Set Digital Output 1	10013	0 or 1	1=sms 2=serial 3=dataconnection
Set Digital Output 1	10014	0 or 1	1=sms 2=serial 3=dataconnection

Sample:

```
$QVMESS,silo1,0,10001,1,Port 1 from silo1 is open*64
$QVMESS,scania1,0,10005,120#0#200,Scania1 has 120 degrees temperature*64
```

```
   $QVMESS,scania1,0,1,0,*64
   $QVMESS,scania1,0,10000,01000100,00010011,0.43,0.28,4.08,*64

Switch digital Port 1 to ON with dataconnection:
   $QVMESS,SteppTTallinone,0,10011,1,3*64

Request Status:
   $QVMESS,scania1,0,10000,,,,,*64
   TraxxerMGR should answer with
   $QVMESS,scania1,0,10000,01000100,00010011,0.43,0.28,4.08*64
```

$QVCMD

remote control of QV
available only in QV Pro, at least 3.0.107

POSSTYLECOLOR

change color of position-symbol
e.g. **$QVCMD,xyz,POSSTYLECOLOR,255*64** change color of vehicle xyz to red

```
Field Number, fields separated by COMMA:
 0) $QVCMD
 1) Sender ID      String, Name of sender, if not empty
                   will be used as Sender_ID in QV
 2) POSSTYLECOLOR
 3) color          Number, same as result of RGB()-Function
 ...               additional field may come in the future
 *XX               NMEA-Checksum
```

POSSTYLESYMBOL

change symbol and size position-symbol
e.g. **$QVCMD,xyz,POSSTYLESYMBOL,3,64,e:\tmp\sym_ktm950.qvs*64**

```
Field Number, fields separated by COMMA:
 0) $QVCMD
 1) Sender ID      String, Name of sender, if not empty
                   will be used as Sender_ID in QV
 2) POSSTYLESYMBOL
 3) type           0=symbol, 1=arrow, 2=crosshair, 3=symbol no rotation
 4) size           size of symbol in map in pixel
 5) filename       complete path/filename for type=0 or type=3
  ...              additional field may come in the future
  *XX              NMEA-Checksum
```

SHOWPOINT

set map-cursor to this position
e.g. **$QVCMD,,SHOWPOINT,50.1,7.2*64**

```
Field Number, fields separated by COMMA:
 0) $QVCMD
 1) Sender ID,     not used
 2) SHOWPOINT
 3) Latitude,      decimal wgs84, south is negative
 4) Longitude,     decimal wgs84, west is negative
  ...              additional field may come in the future
  *XX              NMEA-Checksum
```

REQADRESS

New in QV-Pro 3.0.112

Request an address from a position. QV will send the same string back completed with the address at the position
e.g. **$QVCMD,xyz,REQADRESS,50.09745,7.19737,*64**
will be answered with:
e.g. **$QVCMD,xyz,REQADRESS,50.09745,7.19737,Weinbergstr.*64**
If no address was found or no vectormaps are installed, an error code will be returned:
e.g. **$QVCMD,xyz,REQADRESS,50.1,7.2,-1*64 // no adress found**

```
Field Number, fields separated by COMMA:
 0) $QVCMD
 1) Sender ID,     String, Name of sender
 2) REQADRESS
 3) Latitude,      decimal wgs84, south is negative
 4) Longitude,     decimal wgs84, west is negative
 5) empty field,   will be filled with the address
                   or with errorcode:  -1:  no address found
                                       -2:  no data installed
  ...              additional field may come in the future
  *XX              NMEA-Checksum
```

Special commands regarding BLIDS

available only in QV 4 Pro, at least 4.0.5

$QVPOS

like complete Position, used to transmit lightning-data

$QVPOS,touratech,11,110705,132759.996,47.8903121,23.6345958,-22.9,1,0*2f

```
Field Number, fields separated by COMMA:
 0) $QVPOS
 1) Sender ID   String, Name of sender, customer ID,
                e.g. BLIDS1234, or DWD12, must not be empty
 2) Status      Number,
                10=Timestamp
                11=Live
                12=db query result count
                13=db query result
                19=end of transmission
 3) UTC Date    ddmmyy
 4) UTC Time    hhmmss.sss
 5) Latitude    decimal wgs84, south is negative
 6) Longitude   decimal wgs84, west is negative
 7) Power       kilo-Ampere
 8) Type        1=Ground, 4=Cloud
 9) Count       Number, only used in Status=12 as query result count
 ...            additional field may come in the future
 *XX            NMEA-Checksum
```

```
 If no data is available, a QVPOS just with the time:
 $QVPOS,touratech,10,110705,132759.996,0,0,0,0,0*2f

 After the last record, send an "end of transmission":
 $QVPOS,touratech,19,0,0,0,0,0,0,0*2f
```

$QVCMD

BLIDS

```
Commands related to Blids

e.g.
$QVCMD,xyz,BLIDS,cmd,datefrom,timefrom,dateto,timeto,north,south,east,west*64

Field Number, fields separated by COMMA:
 0) $QVCMD
 1) Sender ID      String, Name of sender, customer ID,
                   e.g. BLIDS1234, or DWD12, must not be empty
 2) BLIDS          Name of Command
 3) cmd            11=Request livedata
                   12=Request db query result count
                   13=Request db query result
 4) date from      UTC date ddmmyy,
 5) time from      UTC time hhmmss.sss, send all data since from
 6) date to        UTC date ddmmyy,
 7) time to        UTC time hhmmss.sss, send all data until to.
                      If to is zero, send until now
 8) north          decimal wgs84   if not zero, optional region for data
 9) south          decimal wgs84
10) east           decimal wgs84
11) west           decimal wgs84
  ...              additional field may come in the future
  *XX              NMEA-Checksum


Example:

QV->Blids: Request Live-data, all since 12:00, Sender ID is "touratech":
   $QVCMD,touratech,BLIDS,11,100805,120000.000,0,0,0,0,0,0*xy

Blids->QV: If no data is available, answer with timestamp:
   $QVPOS,touratech,10,110705,132759.996,0,0,0,0,0*2f

Blids->QV: Otherwise answer with all available lightning-data:
   $QVPOS,touratech,11,110705,132759.996,47.8903121,23.6345958,-22.9,1,0*2f
   ...
Send end of transmission as last record:
   $QVPOS,touratech,19,0,0,0,0,0,0,0*2f




QV->Blids: Request db query result count from 9.8.-10.8
   $QVCMD,touratech,BLIDS,12,090805,120000.000,100805,120000.000,0,0,0,0*xy

Blids->QV: Answer with db query result count, assuming a count of 2340:
   $QVPOS,touratech,12,0,0,0,0,0,0,2340*2f

   ...
Send end of transmission as last record:
   $QVPOS,touratech,19,0,0,0,0,0,0,0*2f
```

```
QV->Blids: Request archive data from 9.8.-10.8
   $QVCMD,touratech,BLIDS,13,090805,120000.000,100805,120000.000,0,0,0,0*xy

Blids->QV: Answer with all lightning-data:
   $QVPOS,touratech,13,110705,132759.996,47.8903121,23.6345958,-22.9,1,0*2f
   ...
Send end of transmission as last record:
   $QVPOS,touratech,19,0,0,0,0,0,0,0*2f
```

In case of error, use $QVMESS with messagetype 2 to return an error description.

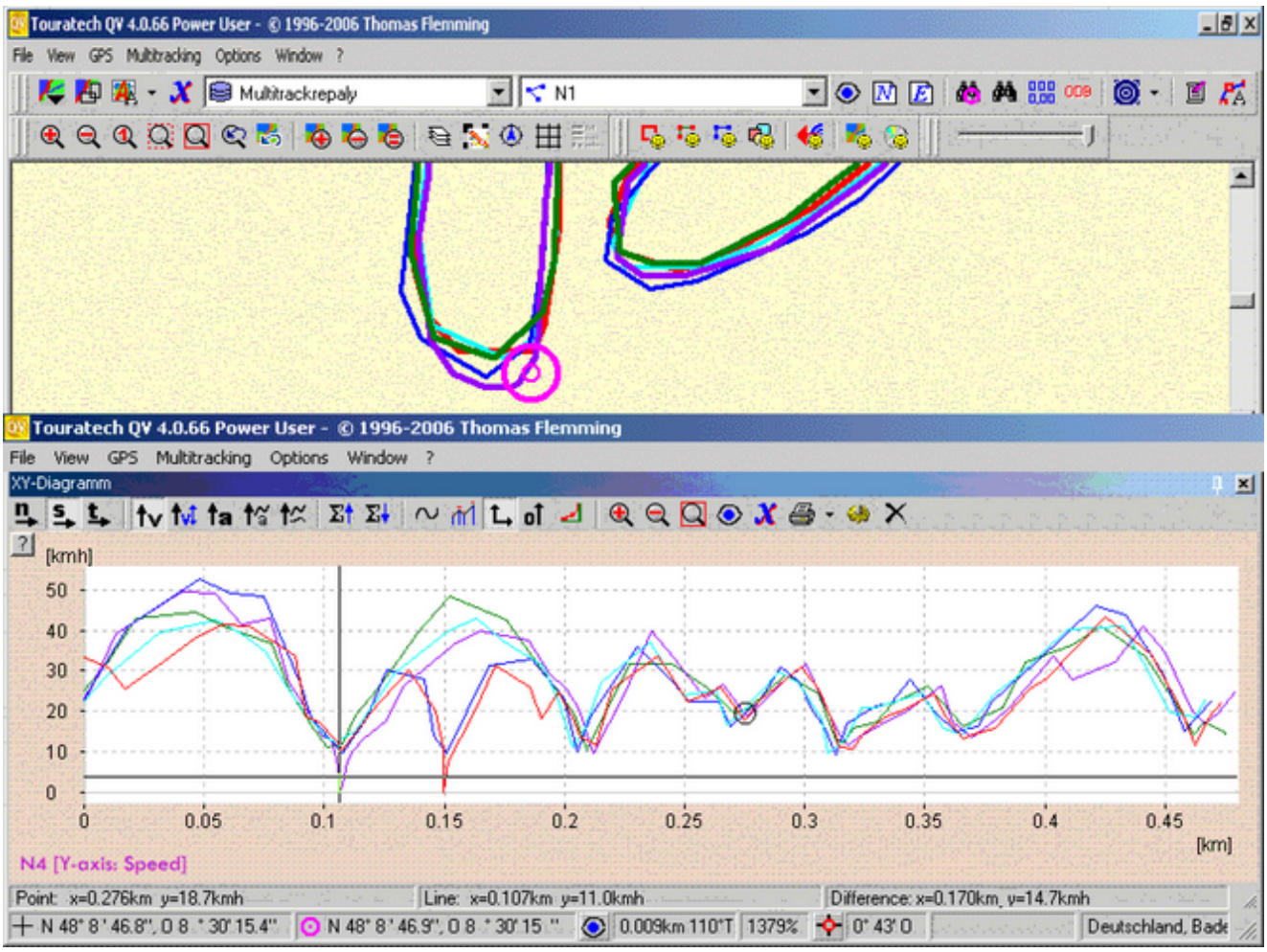
X/Y Diagrams

X/Y Diagram

The XY diagram is a graphic tool for analyzing and visualizing tracks and routes. Speed and altitude can be evaluated in relation to the distance travelled or the time.

At a glance you can see information such as:

- Where was I and when?
- When will I probably arrive where?
- What does the terrain look like? (Altitude profile)
- How long did it take from here to there?
- Who was faster?
- etc.



Generating the XY diagram

Basically the diagram window is opened from the *route*, *route waypoints*, *track* or *trackpoints* pop-up menus. And, of course, from the *QV X-Plorer* or directly from the map window with a right-click on the name and by selecting *XY Diagram* from the pop-up menu.

If you run the XY Diagram from a track or route pop-up menu, the diagram window opens and the track or the route is plotted.

If you run the XY Diagram from a trackpoint or route waypoint pop-up menu, the diagram window opens and the black indication-line in the diagram will be placed at the position of the selected trackpoint or route waypoint. In this way you can identify any point from the database of the route. Conversely, you can also find the point on the map by double-clicking on the diagram.

Note: Tracks and routes are plotted additionally into the XY diagram! This means that older plots are not automatically cleared. If you want the diagram to show only one track or route you have to clear it first by clicking the icon.

Functions

The diagram line is automatically calculated from the data available. Depending on the available data different analysis can be performed.

You can assign the point number, the distance traveled or the time to the X axis. The number and distance is always available from the GPS-coordinates while the time can only be displayed if this information is also available in the database. For example tracks that originate from a Garmin logfile usually have time information stored.

Horizontal and vertical speed, GPS-altitude, altitude according to the DEM and altitude above ground are available for the Y axis. Speed and altitude must also come from the database, the altitude according to the DEM is always calculated; however this requires DEM data to be installed in *QV*. Vertical speed is calculated from altitude and time differences. Thus this information is only available if data on altitude and time is available in the database.

In the simplest case, if your track only to consists of coordinates and there is no other information available, you will at least receive an altitude profile of your track from the DEM.

The diagram is always plotted in the color of the track or the route that has been set as style in the *QV X-Plorer*. The scaling is automatically calibrated according to the window size. You can adapt the diagram size to your needs by zooming the diagram window to the desired size.

Mouse function in the diagram

You can read three corresponding sets of values from the diagram using the mouse pointer. These are displayed in the status line:

Point: x=... y=... Shows the values of the red dot that moves along the plotted line as you move the mouse pointer.

Line: x=... y=... Shows the values at the intersection of the horizontal and vertical black indication lines which are projected as soon as you click with the left mouse button at a specific point of the diagram plot. A double click displays this point on the map.

Difference: x=... y=... Shows the difference between the *Point* and *Line* values (see above). In this way you can measure distances, time intervals and altitude differences depending on which axis has just been set. The difference will be emphasised by two green lines on the diagram. Differences will also be indicated in percentage of change.

Note that X and Y are always specified in the unit that are actually set. For example, if you have set "Time" on the X axis, X is a time given in days, hours and minutes.

Functions of the diagram symbol bar

X axis: Point number Number of the point, i.e. equal division of the X axis.

X axis: Distance	Distance is automatically calculated from the coordinates. For routes generated by the route planner it is the real distance that the routing module has determined.
X axis: Time	Date/Time. For track logs from the GPS unit, this is the time at when you have been at this place. For tracks or routes generated by the route planner it is the calculated (predicted) time when you will be at this place.
Y axis: Speed	This is the (horizontal) GPS-speed as measured by your GPS receiver; only if available in the database.
Y axis: Vertical Speed (climbing / descending speed)	The vertical speed is calculated from altitude changes over a certain time interval. Positive values reflect climbing speeds, negative values reflect descending speeds.
Y axis: Altitude	GPS altitude as stored in the database.
Y axis: Altitude DEM	Altitude from the DEM. Can only be calculated if DEMs are installed in *QV*.
Y axis: Altitude above ground	Difference between GPS altitude and altitude according to DEM. This approximately corresponds to the flight altitude above ground. Only available if the database includes altitudes altitude data and a DEM installed in *QV*.
Cumulated sum increasing / decreasing	Cumulated altitude sums will be displayed. Ascents and descents will be shown separately. Under **Settings** a smoothing factor can be entered. Altitude variations which are smaller than this value will be ignored.
Smooth curve	On/Off button: The plot will reflect actual measured values or a smoothed representation of actual measurements.
Draw vertical lines and WP names	On/Off button: A vertical line (anchor) will be drawn to the X axis at each point. Also the WP name will be labeled if WP's are to be plotted. Note: You can define whether the WP name for each WP is plotted or not by setting the **Style** marking properties. If the **Show name** attribute is disabled, the name of this WP will not be labeled in the diagram.
Draw XY axes	On/Off button: If you want to enlarge the space for the diagram plot, you can hide the XY axes using this button.
Line of vision	On/Off button: Draws the projection of the line of sight from any point of the plot. Points which are out of (theoretical) sight are below this line, points above this line are within the field of vision. Three option under Settings will influence this calculation: "straight", "earth curvature" and "radio" are available.
Zoom In	Enlarges the diagram in the central area. The + button of the keyboard has the same function.
Zoom out	Minimizes the diagram size in the central area. The - button of the keyboard has the same function.
Zoom all	Fits the diagram to the size of the diagram window.

Show in map — On/Off button: If enabled, the map cursor will automatically represent the corresponding point in the diagram.

X-Plorer — On/Off button: If enabled, the corresponding *X-Plorer* data set will automatically be indicated when clicking on a point in the diagram.

Print — The diagram will be printed in full size (autoscaling function).

Export XY-List — Creates a text file with the corresponding x/y values of the whole diagram. X and Y values are separated by tabs.

This file can easily be imported to MS-Excel for further layout or analysis.

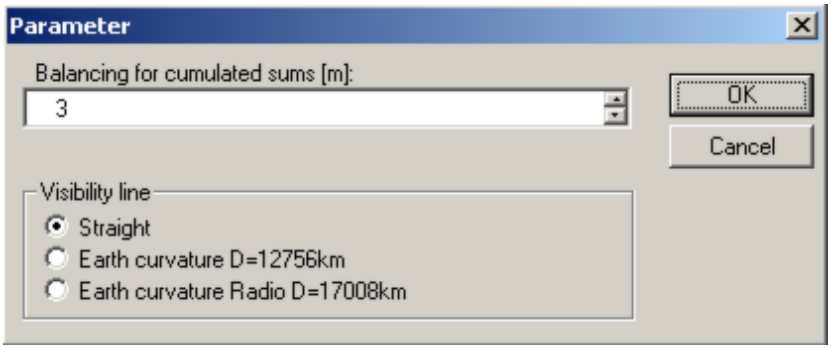
Export DXF — Creates a DXF file of the diagram which can be imported and further analysed with AutoCAD® software.

Only the scaled polyline is exported as a curve without axis.

Copy to dashboard — Copies the diagram as a bitmap to the dashboard.

Export to Bitmap — Saves the bitmap of the diagram on the hard disk drive.

Settings



In this window the smoothing factor for the cumulated altitude values can be specified.

Furthermore, the algorithm for calculating the "line of sight" can be selected in this window.

Delete diagram — Delete all plots from the diagram.

Mouse and keyboard functions in the diagram window.

Mouse movements with pressed and hold left mouse button	Move the diagram
Mouse click	Set cursor and select curve if more than one curve is available in the diagram. The selected curve is indicated on the lower left side of the diagram.
Mouse Wheel	Zoom in/out.
+	Zoom in.
-	Zoom out.
Shift +	Zoom in - only Y axes.
Shift -	Zoom out - only Y axes.
a	Fit zoom size to the diagram window.
y	Switch the active Y axes.

c	Center on cursor position.
Ctrl c	Copy the diagram as a bitmap to the clipboard.
Arrows	move diagram within the window.

Digital elevation models DEMs

A digital elevation model (DEM) is a file in which the terrain altitudes for a specific area are stored as a 3D matrix. Similar to a digital map, a DEM has a specific resolution and must be calibrated, i.e. there are specific rules on how to extract the corresponding altitude for a given geographic coordinate.

QV can read DEMs and thus specify altitude values for any coordinate. Thus you can calculate an altitude profile for a planned tour, add altitude information to existing GPS data and create a three-dimensional picture of the landscape with the 3D diagram function.

However, similar to maps, most DEMs are copyright protected. In other words, normally you must buy this data and, of course, the higher the resolution the more expensive they are. Furthermore, there are many different DEM suppliers and therefore many file formats, too.

QV can read the following DEMs:

- The freely available Globe DEMs from the American NOAA institute, resolution 30' (approximately 1km).
- The DEMs from the Top50 CDs of the federal geographic institutes in Germany, resolution 50m.
- The SRTM3 and SRTM30 data in the HGT format, resolution approx. 90m and 1km, respectively.

Installing NOAA Globe DEMs

- Download the required Globe file(s) from http://www.ngdc.noaa.gov/seg/topo/gltiles.shtml. The earth is divided into 16 files named *A10G*, *B10G*, *C10G*, etc. The files are zipped and can be really huge, up to 50 MB.
- Unzip the file(s) and copy them into the *DEM* directory within the *QV* main directory.
- You will also need the header files that contain the calibration info. You will find these files at ftp://ftp.ngdc.noaa.gov/GLOBE_DEM/data/elev/esri/hdr. The header files must also be copied to the *DEM* directory. They have the same name but a **.HDR* extension, so, for example, header *C10G.HDR* belongs to the DGM file *C10G*.
- Finally you must register the new DEMs in *QV*. Refer to **DEM management** for information on how this is done.
- If you install *QV* from the *QV* CD, a excerpt from the Globe series will be installed automatically to the TTQV\DEM directory. This DEM is named c-europe and covers the areas of Germany, Austria and Switzerland.

Installing SRTM DEMs

If you install the SRTMs from our SRTM DVD, all you have to do is run the setup routine and select the desired tiles. All required settings will be made automatically in *QV*.

If you want to download the HGT files yourself, you should copy them all in a separate directory. Then, choose **Import New DEM** and mark a <u>single</u> *.hgt file. *QV* will recognize automatically that all DEM files belong together and will create only a single database entry which will contain all tiles of the directory.

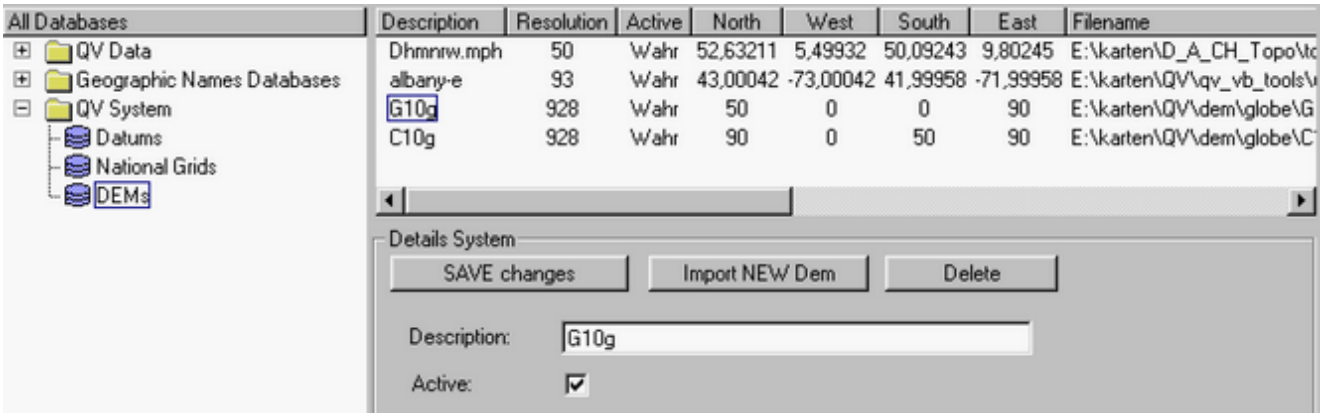
Installation of DEMs from the Top50-CDs

The Top50 v3 CDs of the federal geographic institutes in Germany as well as the AMAP contain a DEM of the corresponding federal state / country with a very high resolution (50m) in the DGM directory. This DEM consists of two files that are named, for example, *dgm_sn40.mph* and *dgm_sn40.hpr* (you will also find *dhm_** instead of *dgm_**). Proceed like this:

- Although you can use the DEMs also from the CD, we recommend to copy these two files to the hard disk for increased performance, preferably to the TTQV\DEM directory.
- You can directly import the Top50 v3 DEMs. Just choose **Import New DEM** and select the

*.*mph* file of your choice.

DEM management with the QV X-Plorer



DEMs are managed centrally in the *QV X-Plorer* under *QV System*, section DEM. The list window displays all DEMs installed with their properties:

Description — A user-defined text that describes the DEM. In the *Description* field of the *X-Plorer* detail window you can change this text. The file name is used as default.

Resolution — This column specifies the resolution of the DEM, 50m with Top50 v3 DEMs and 1000m with Globe DEMs. The resolution refers to the raster distance in metres in which altitude values are available. Please note that the resolution does not define the absolute accuracy of the altitude values!

Active — If the content of this variable is *True*, this DEM is used by *QV*, if the notification is *False*, the DEM will not be used. The setting can be changed with the checkbox at the bottom of the window.

North, West, South, East — Defines the extent of the DEM, i.e. the area which is covered.

File name — Lists the path and file name on the hard disk. If the file is not found this will be indicated in red color.

If you select a DEM from the list, the following options are available in the detail window:

Description — Change the description text.

Active — Switch for enabling or disabling a specific DEM.

SAVE changes — If you have changed the description text or the status, you must save the changes with this button.

Delete — The DEM will be removed from the database and is no longer available to *QV*. The files will not be erased from the hard disk, only the database entry is removed.

Import New DEM — New DEMs can be installed with this option.

A file selection box will open where you have to select the *.*hdr* header file. Note that the corresponding DEM must be located in the same directory.

Use this function after you have downloaded the DEMs from the NOAA DEM website together with the header file. See above.

It could be the case that several DEMs have been installed for the same region, for example the

Globe DEMs and also some CDs of the Top50 v3 series. In this case, *QV* automatically selects the DEM with the best resolution for a given area. If you want to use a specific DEM you to enable or disable the *activate status* accordingly. DEMs where the content of the Active column is *False* will not be considered.

DEM functions in *QV*

The only function of the DEMs is to specify the altitude of a given coordinate. In *QV* this is required for different functions:

Show altitude at the mouse pointer	This feature can be enabled or disabled under **Options - Settings - Map**. Just as with the **Identify Country under Mouse** function, the altitude of the mouse pointer will be displayed in the main window status line.
Calculate Altitude from DEM	This function is available for waypoints and trackpoints in the QV *X-Plorer* detail window. Next to the **Altitude** input field, a **DEM** button is located. If you click on it, the altitude for this coordinate will be extracted from the DEM and entered into this field. This function also works with multiple selections.
Terrain section with the XY Diagram	To generate an altitude profile, first of all create a new track or a new route on the map with at least two points. The line connecting the points will define the terrain intersection line. Now generate the XY diagram for this track or route by choosing **XY Diagram...** from the pop-up menu. You have to click on **X Axis: Distance** and **Y Axis: DEM Altitude** in order to generate an altitude profile with the DEM altitude plotted against horizontal distance traveled along the track or route.
Automatic calculation of altitude with new WPs and Trackpoints	If you create new waypoints or tracks, *QV* will automatically extract the altitude from the DEM and store it in the database. You can check this in the Altitude column in the *X-Plorer* list window.
3D Diagram	Generates a three dimensional view of the landscape and displays this in a separate window. You can move or fly freely through the landscape and overlay maps of your choice. See chapter *3D Diagram* for further details.

Further functions:

- In the altitude field of the main window status line the active DEM is indicated together with the altitude value.
- Clicking on the altitude field of the main window status line will open the corresponding DEM table in the *X-Plorer*.
- *QV* will automatically choose the DEM with the best resolution for a given point.

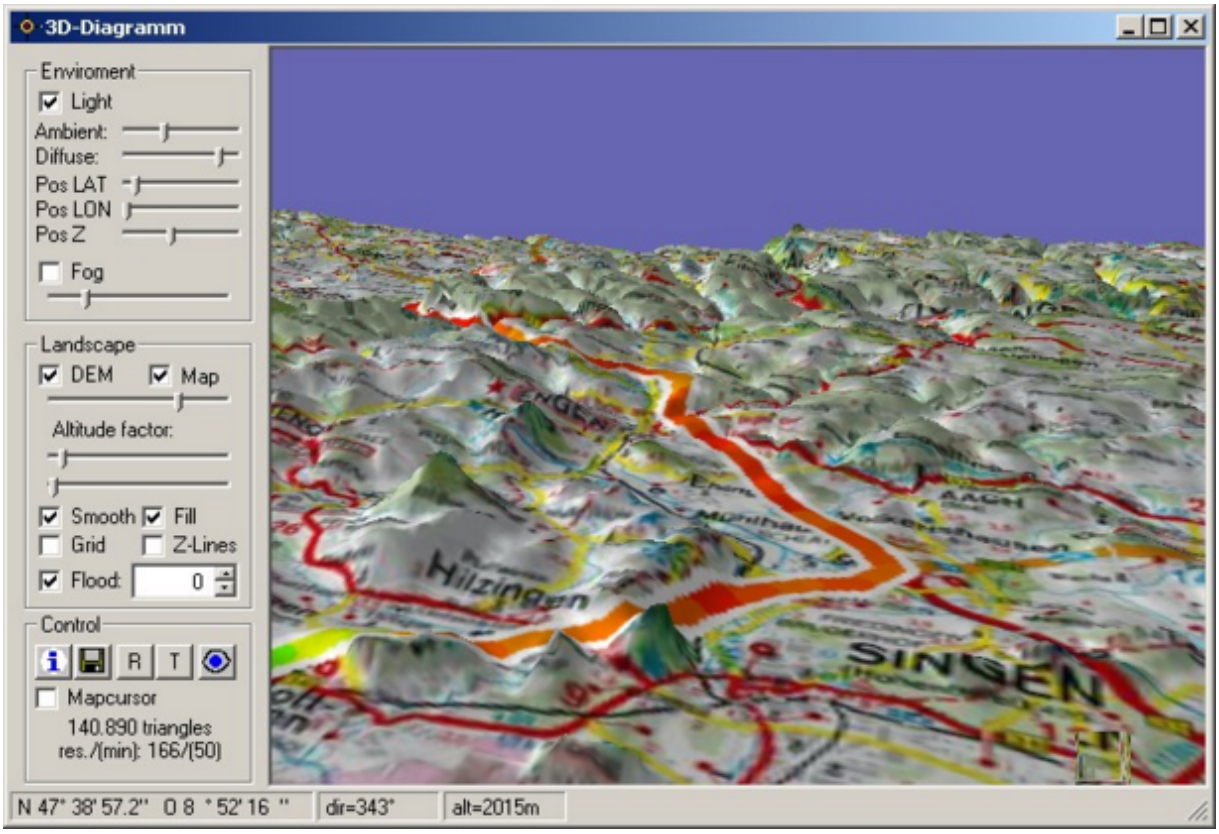
3D Diagram

Before we start

This function is "experimental". This does not mean that it does not work or is always crashing. However it was not actually intended for publication but to show "what is feasible".

We would not like to state that *QV* is the brilliant 3D program which would be able to show the whole world in a virtual 3D reality and open a completely new dimension. There are other programs which are specialised on that such as Google Earth (see separate chapter).

And so we almost took the function out again, but then we decided to simply leave it in QV as it was. Because it is interesting all the same. And we continue developing it from time to time...



But now in detail

As we said, the idea is to visualize tracks and routes. Thus you start the function by clicking on the name of the track or the route, either in the *QV X-Plorer* or on the map by selecting **3D Diagram** from the pop-up menu.

The 3D diagram consists of a control area on the left and the actual 3D area with the landscape on the right.

Environment

Light Switches the light in the scene on and off (then of course, it is all black) and controls the brightness with a slider. With Lat/Lon the position of "Sun" can be set, and with Z its altitude.

Fog Switches on a "fog effect" with adjustable intensity. Fog makes distant objects disappear into gray.

Landscape

DEM

Switches the landscape on and off and controls the number of areas that are to be calculated. This is the slider that has the greatest effect on the picture.

Imagine the landscape as a uniform grid like a net. For each grid point an altitude is calculated from the DEM and the net is drawn to this point depending on the altitude. The more net meshes there are the more detailed the landscape.

The procedure can take some time and so a progress bar appears and information on how many areas will be calculated is given:

10.736 triangles
res./(min): 57/(50)

57/50 means, that a resolution of 57m is actually used and that the optimal resolution would be 50 m. By tearing the slider to the right the resolution decreases. As soon as the resolution setting becomes suboptimal, the characters will change to red:

22.302 triangles
res./(min): 39/(50)

In this case you will only increase time for calculation without improving the result.

Of course, nets can only be calculated if DEM data is available. See chapter Digital Elevation Models. The **Active** setting determines which DEM data is used. If Top50 data with a 50 m resolution is available this will naturally give a more detailed picture as the SRTM 3 data.

Map

Overlays the current map as texture over the grid.

Altitude Factor

Controls the "amplification" of the altitude. With rather flat landscapes the altitude can be enhanced to highlight differences.

Smooth

Smoothes the surface.

Grid

Draws a uniform baseline grid at altitude 0. This is useful when only the track is to be plotted without landscape.

Z-Lines

Draws a vertical line from each track- or waypoint downwards to altitude 0. This gives the track a 3D effect.

Flood

Simulates a flooding of the landscape up to the specified level. Below an example with high water at Lake Constance:

Control

Info Displays an info window with instructions on which keys to use to control the 3D area and other technical information.

Save Saves the actual layout as a bitmap.

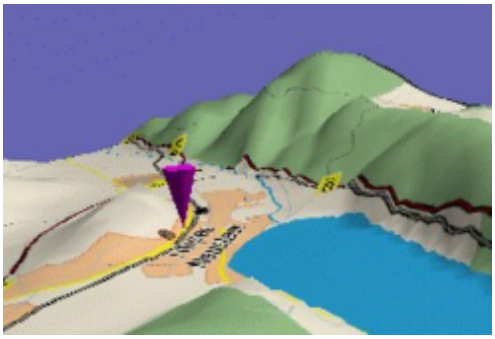
Reset S R If you got lost you return to the default view using this button.

Top T Changes to top view.

Show With each mouse click a purple cone will be placed as cursor on the 3D surface.

If you click on the *Show* button , the cursor will be placed at the corresponding position in the standard map window.

If you enable the *Mapcursor* function, the cursor positions will be synchronized automatically between the standard and 3D map window:



You can navigate through the 3D map surface with a click-hold-and move of the left mouse button or by using the keyboard:

Arrow up/down Moves forward/backwards. You will see the current position above ground in the status line in the first field in the current units.

Arrow right/left Panning clockwise/counter-clockwise

This will result in a turn to the right or left and your view direction will change accordingly.

Your actual view direction will be shown in the status bar below the window. For example *Dir=225°* would mean that you look in a south-western direction.

Page up/down With these buttons you can control the altitude of the camera above the ground. The altitude level is listed in the right hand field of the status bar below the window.

Pos1/End Vertical view direction upwards/downwards. The camera will look in the same direction but with different altitude angles in relation to the ground.

Q/W Sideway movement of the camera towards right or left without changing the view direction.

Enter Will indicate your actual position on the map surface; identical to the *Show* button (see above).

A few more notes

Just like the XY diagram the 3D diagram can also be linked with the track replay function. Therefore if you have a track plotted on the map and in the 3D diagram and run *Track Replay*, the 3D arrow will be synchronized and follow the track along the 3D surface in the 3D diagram. However the 3D surface will not be moved automatically within the window, you will have to arrange this manually.

PDA interface

Data exchange with PDA's

QV is a pure Windows application.

However, there are 2 GPS programs for PDA navigation from other companies which are perfectly integrated into QV in order to guarantee an easy exchange of data.

Pathaway for Pocket-PC and Palm operating system

Pathaway is a moving map software which will show your current position and your track on any raster map. Due to its universal map plotting capability it is optimally suited for all applications in Offroad navigation.

Furthermore it handles a direct data exchange with Garmin GPS receivers. During longer trips you can backup your Garmin memory and create new routes on the map in your PDA and upload them to your Garmin GPS unit.

Digi-Map for Palm operating system

Digi-Map is a road-based navigation system for a voice-guided routing with special Navteq vector maps.

Please note that the corresponding interfaces are not supported by *Touratech QV Light*.

PathAway

The chapter describes the interface between *Touratech QV* and *PathAway* and how to use them optimally. These are:

- Sending calibrated map clips from *QV* to *PathAway*.
- Automatic creation of several map clips along a route in *Touratech QV* for *PathAway* Export.
- Uploading waypoints, routes and tracks from *QV* to *PathAway*.
- Downloading of waypoints, routes and tracks from *PathAway* to *Touratech QV.*
- Automatic data transfer from *Touratech QV* through the *HotSync* function for PDA users.

Note that the *PathAway - QV* interface is not supported by the *QV Light* version!

What is PathAway ?

PathAway is a PDA software of the Canadian company *MuskokaTech Inc.* programmed by *Scott Northmore*. It is a GPS navigation software for PDA with Palm-OS version 3 or higher. It is a GPS navigation software for PDAs with Palm-OS version 3 or higher or, alternatively, for Pocket-PCs with PPC-OS or Windows Mobile.

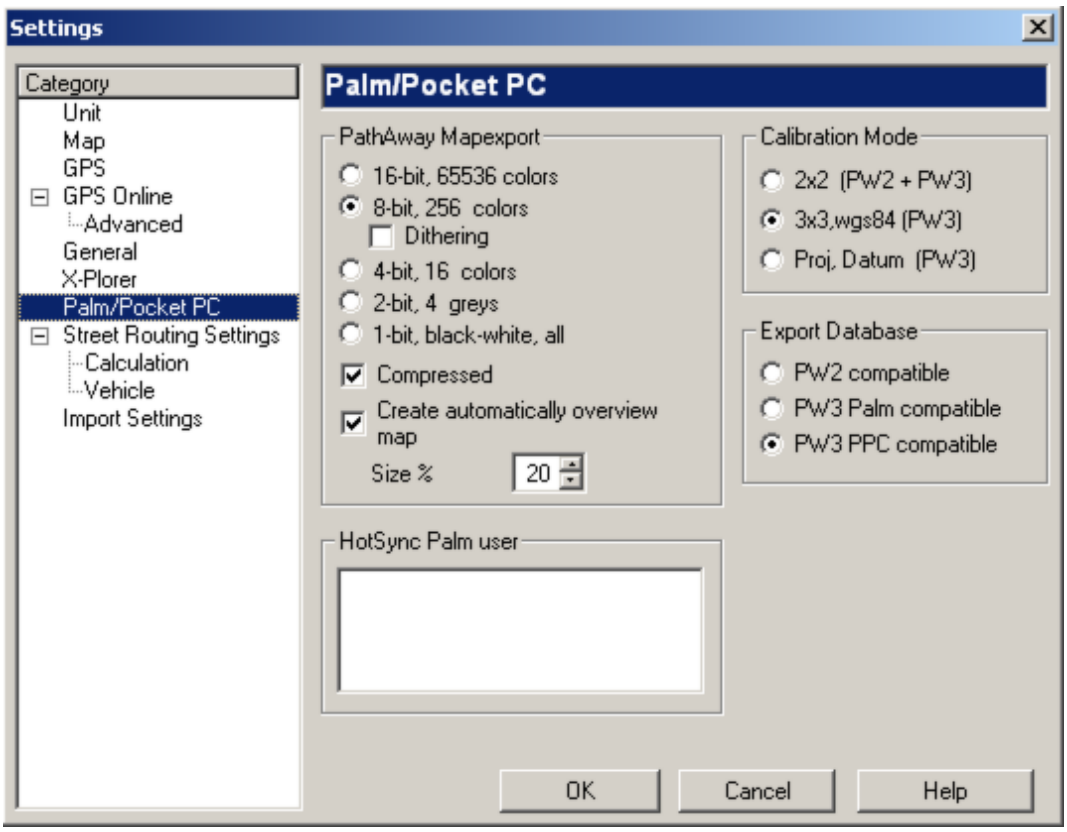
PathAway can:

- Display nearly every map (raster maps with uncurved lat/lon lines).
- PathAway can also load 3x3-calibrated and projection calibrated maps from QV
- With optional memory cards the storage capacity for maps is virtually unlimited.
- Manage waypoints, routes and tracks through an integrated database.
- Show your position on a map with an NMEA-compatible GPS receiver connected to a PDA and give navigation details, such as course, distance, etc.
- Record tracks and, if requested, reverse the track into a route for the way back.
- Save waypoints, routes and tracks from Garmin® GPS devices.
- Upload saved waypoints, routes and tracks into Garmin® GPS devices.
- Summarized shortly, *PathAway* is an ideal supplement to *Touratech QV* when traveling with a PDA.

For our German speaking clients we have translated the software and the manual and also extended *QV* by special functions so that the programs will perfectly work and in hand. The German *PathAway* version is exclusively available through *Touratech*. However, the *PathAway - QV* interface also works with the English program version.

Basic Settings for PathAway

Before data can be exchanged with *PathAway*, you have to configure some parameters under **Options-Settings**:



Map export

16-bit **8-bit dithering** **4-bit** **2-bit** **1-bit**	Determines the no. of colors for generating the *PathAway* map. As a 256 color map will need twice as much memory as a 16 color map, you can save considerable memory requirements by reducing the color resolution. Most maps are well readable with 16 colors, although the specific colors will change to some extent. The option **8-bit dithering** is worth to try since it may deliver a better result with some maps.
Compressed	A special feature in order to save memory. This option should be generally enabled.
Create overview map	With extended maps you may easily loose the overview on the small PDA Display. If enabled, this function will automatically create a second overview map which is scaled to x% as specified. In *PathAway* you can easily switch between the maps and thus navigate efficiently. The overview map will be stored under the same name which will be extended by "_x". The map is handled as a separate map in *PathAway*. The size of the overview map can be freely scaled to x% of the original map.

HotSync Palm User **This option is only supported for Digi-Map and Pathaway-PALM; it is not available for Windows Pocket PC / Windows mobile.**

All Palm Users which you have created using your Palm Desktop software will be listed here.
Choose one or more User to whom you want to address *QV* maps and databases and QV will transfer the data to several PALM PDAs without the need to export the related data several times.

If you do not specify a user here, maps will be saved as *Pro* files on the hard disk drive while waypoint, route and track files will be stored as *PDB* files.

Calibrating Mode These options control how *QV* should generate the calibration file for the *PathAway* map export:

2x2

As for *PathAway* version 2, thus, suitable only for maps with uncurved latitudes and longitudes. QV will align the map towards N-S direction, so the bitmap may loose some quality. On the other hand, data processing will be very quick in *PathAway*.

3x3

For *PathAway* version 3 only. Accurate calibration also for curved grids. The map datum will always be converted to WGS84 and the bitmap will not be rotated. Please note that data processing will be slower (when compared to the 2x2 option) due to increases CPU load.

Proj, Datum

Most projections and map datums will be exported to *PathAway* version 3. Highly accurate but this option may be pretty slow on older PDA models due to excessive CPU load.

Export Database
PW2
PW3 Palm
PW3 PPC

Specify here which *PathAway* version you use in order to guarantee that *QV* will generate a database which is compatible to the *PathAway* version you are using.

If you are using PW4, select PW3 Palm or PPC, which is compatible.

Creating maps for PathAway

Basically almost any map opened in *Touratech QV* can also be exported to *PathAway*. However, please take the following facts into consideration:

Memory:

A PDA is no modern multimedia device with a 2 GHz processor and 1 GB memory capacity! Consequently, you have to handle your memory economically. Also note that the smaller the map the faster will be processed on your PDA.

To save memory space, you can reduce color resolution in *QV* before export. The memory size of a created map will be indicated. Thus you can easily check if there is still enough memory left for this map on your PDA.

Calibration:

PathAway version 2 supports only a simple calibration by longitudes and latitudes. This will work fine with large scaled maps where latitude and longitudes are uncurved and grid cells rectangular.

with a large scale where longitudes and latitudes are rectangular and straight can be processed best.

Touratech QV will automatically perform the necessary map adaptations, e.g. the map will be rotated in order to orient the map properly to north. With map scales not bigger than approx. 1:200.000 the result will be o.k. and with map scales of 1:50.000 the result will be close to optimal. However, with very small maps scales such as 1:500.000 or 1:1 Million, the accuracy will be limited.

With *PathAway* version 3 you can now use any map with exactly specified calibration data. For this purpose 3 new options for a map export have been added (see below).

Procedure

To create a map for *PathAway* use just proceed exactly as you do when printing a map.

Open the requested map and plot tracks, routes or waypoints which you want to be included.

Select **Export Map to Palm PathAway...** from the *File* menu of the main menu bar and a window similar to the *Print Map* window will open. All options will correspond exactly to the ones of the *Print Map* window. After having selected all the requested options, click on **Export** to start the PathAway map creation.

Using the **PDA Settings** button you can directly access **Options - Settings - PDA**. See above.

Uploading waypoints, routes and tracks from *QV* to *PathAway*

In the *QV X-Plorer* you can convert all waypoints, routes and tracks into PathAway databases and transfer these to your PDA. Just select the requested data in the *X-Plorer* and click on **Export to PathAway Database** . You can export single or multiple routes and also one or multiple tables which can even be of different types. Regardless whether it deals with routes, tracks or waypoints, *Touratech QV* automatically creates the corresponding *PathAway*PDB-file.

The following steps will differ according to the operating system of your PDA:

PathAway PALM:

Specify a path and file name where the generated *PDB* file should be stored. As default, the route or table name will be used.

If you have specified a Palm user under **Settings - Palm** all that is left to do is press the *Hotsync* button of your PDA and the data will be transferred to *PathAway* on your Palm.

Pathaway PPC / Windows Mobile:

The database will now be transferred automatically to the PDA. Thus, *ActiveSync* must be started before.

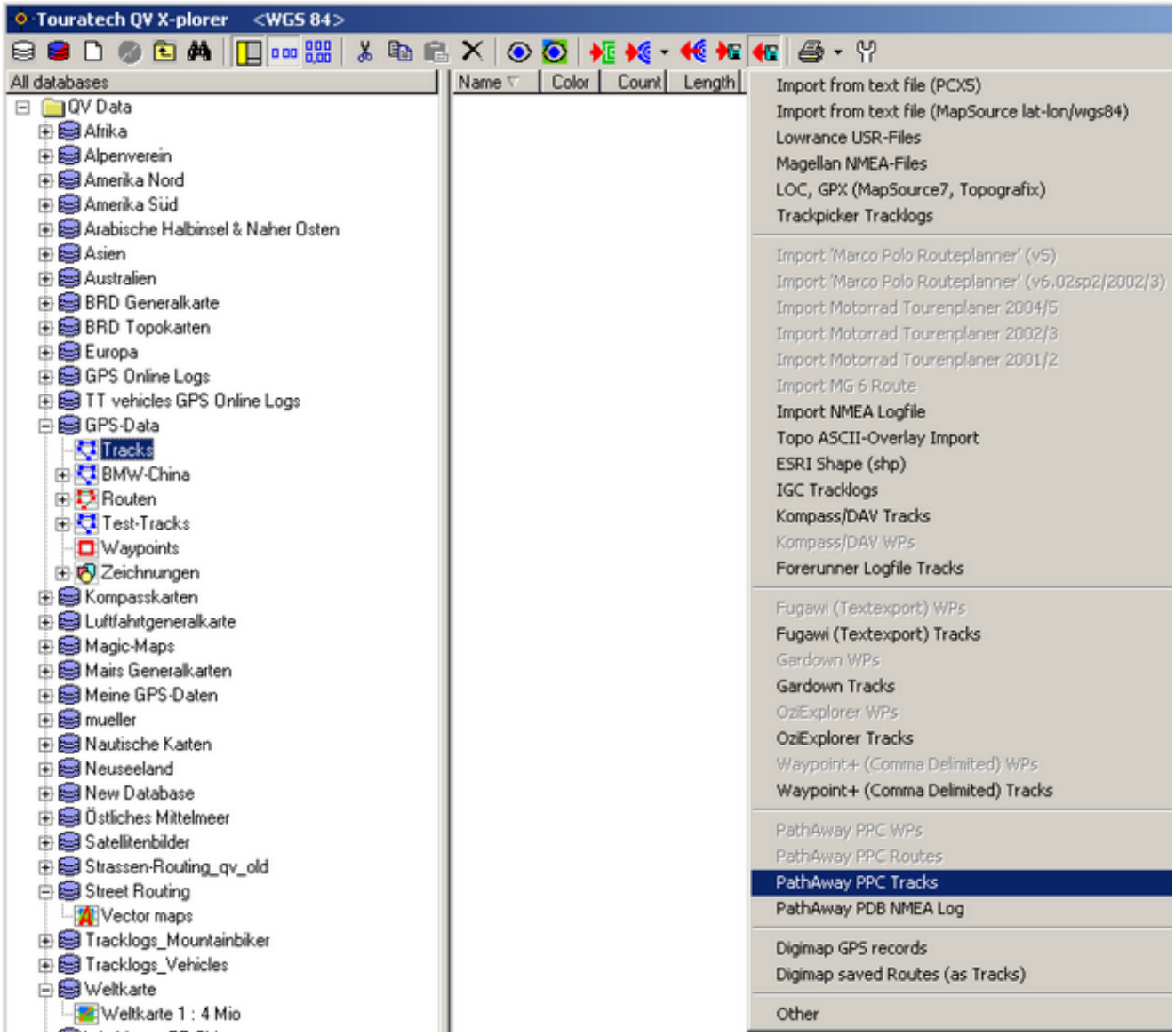
Downloading of PathAway waypoints, routes and tracks to *QV*

Let's assume you had been traveling for 4 weeks with your PDA and transferred your tracks and new waypoints from your Garmin-GPS to *PathAway* on a daily basis. Now you would like to download these data to *QV*.

Please proceed as follows:

Pathaway PPC / Windows Mobile:

- Connect your PDA to your PC and start *ActiveSync*.
- In contrast to data upload to PathAway, you will have to download tracks, routes and waypoints separately. Please download each category one by one.
- So, first of all, select a suitable *X-Plorer* table to which you want to download your GPS data. So, in case of a track to be downloaded, choose a track table, etc.
- Then select **PathAway PPC Track** from the **X-Plorer Import** menu :

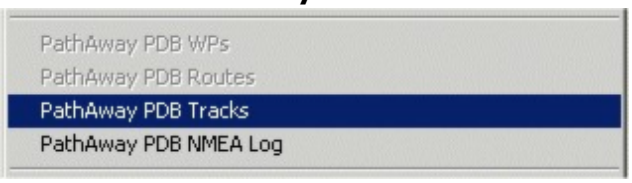


- The tracks will now be imported and are saved in the corresponding *X-Plorer* table.
- Repeat the same procedure for waypoints: Select an *X-Plorer* waypoint table, thereafter the **PathAway PPC WPs** option will be available in the **X-Plorer Import** menu .
- Repeat the same procedure for routes: Select an *X-Plorer* route table, thereafter the **PathAway PPC Routes** option will be available in the **X-Plorer Import** menu .

Pathaway PALM:

- Press the HotSync key on your Palm. This way all new databases including new track and waypoint databases will be copied to the hard disk of your PC.
- You'll find these data in the directory PALM\USER\Backup. PALM is the directory where the Palm Desktop software is installed, usually in c:\palm. USER is a subdirectory within the PALM directory. Here the data of the current Palm user are stored. The name is composed of your surname and the first letter of your first name, e.g. "*FlemmiT*" for the Palm user "*Thomas Flemming*". So in this example you would find the track and waypoint databases under **C:\Palm\FlemmiT\Backup**.
- Although you can export track, route and waypoint tables at once, you will have to import these separately. Please download each category one by one.

- So, first of all, select a suitable *X-Plorer* table to which you want to download your GPS data. So, in case of a track to be downloaded, choose a track table, etc.
- Then select **PathAway PDB Track** in the **X-Plorer Import** menu :



- In the following file selection dialog change to *C:\Palm\FlemmiT\Backup* respectively your Palm user backup directory and choose all track files you want to import. You can select several files at a time by clicking on the files with the Shift or Ctrl key held down. The individual track file names are the same as in *PathAway*.
- Repeat the same procedure for waypoints: Select an *X-Plorer* waypoint table, thereafter the **PathAway PDB WPs** option will be available in the **X-Plorer Import** menu .
- Repeat the same procedure for routes: Select an *X-Plorer* route table, thereafter the **PathAway PDB Routes** option will be available in the **X-Plorer Import** menu .

The function **PathAway NMEA Log** imports the GPS Log from PW as track. This file can be found as *PathAwayLog.PDB* in the backup directory of the Palm user after having carried out a HotSync.

Digi-Map

As Digi-Map user you will know the Digi-Map PC software to create maps or plan routes for you Palm PDA.

All these functions have also been integrated into *QV*.

The Navtech maps which are part of your Digi-Map package are identical with the Navtech maps for TTQV. However, for licence reasons, only the Digi-Map version can be used for navigation with a Palm device.

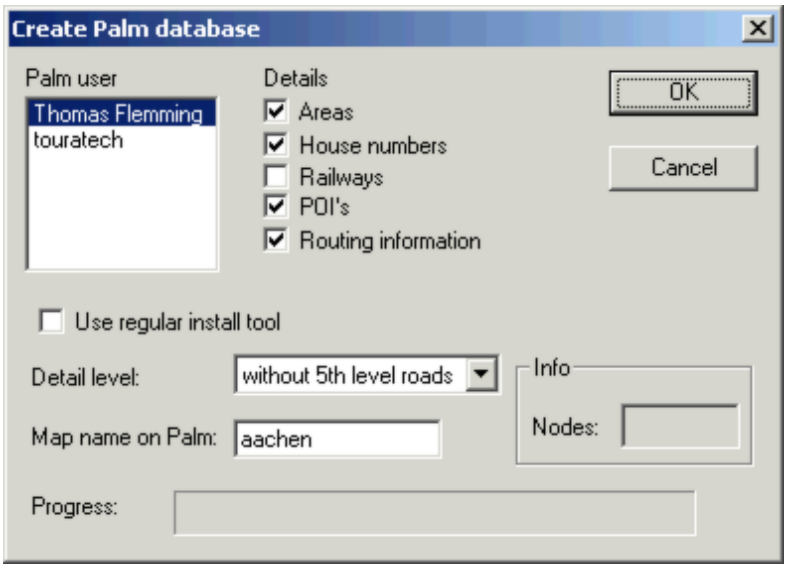
Basic Settings for Digi-Map

Before you can exchange data with Digi-Map you have to specify the **Hotsync-Palm user** under **Options-Settings-Palm**.

Creating Maps

Open the Navtech map **TTQV Navtech Europe** and scroll the map to the requested map extent. Click with the right mouse button into the map and select **Map window to Digi-Map...** from the pop-up menu.

Now a window opens which you already know from the Digi-Map PC software:



For the processing of Palm maps you can choose various options. You specify which data will be included in the generated database:

- POIs (interesting points, such as restaurants, petrol stations etc.); available with special Digi-Map versions only.
- If you want to run routing functions on your Palm, you will have to tick-mark Routing information.
- By default the maps will be copied directly to the installation directory of your Palm. Enable *Use regular install tool* if you want to specify where the maps should be saved. You will need this option if you want to store the maps on a memory card, e.g. a SD-card, etc.
- Detail level: In this pull-down menu you can specify how detailed the generated map will be. Choose between "all street layers" for maximum details and "no Federal Roads". The less details are selected, the bigger the map extend which can be transferred.
- Map name on Palm: This is the map name under which you will find this map on your Palm PDA. (We recommend to use clear names, such as the biggest city of the map window).

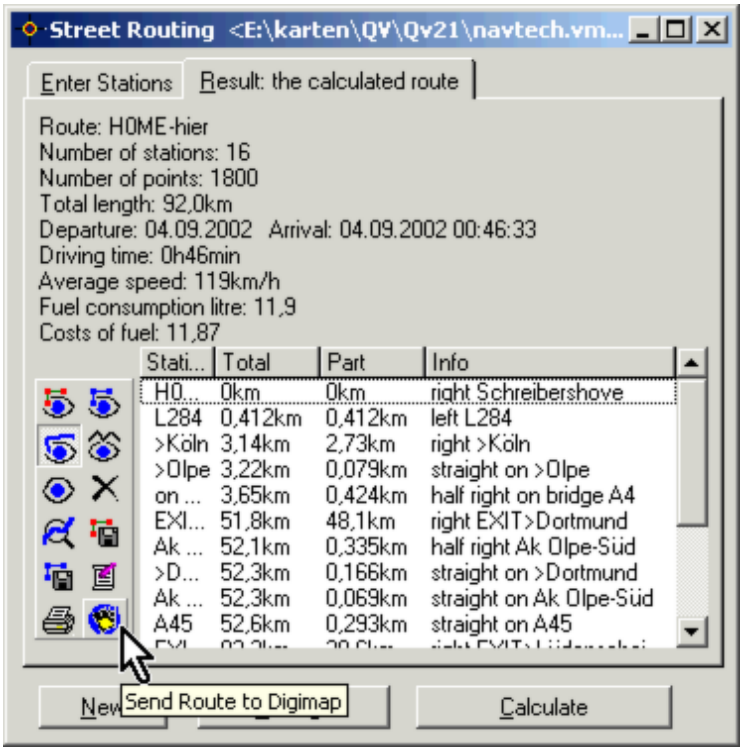
If an error message box appears during the map generation procedure (e.g. "too many nodes…"), you can try the following:

- You can install the map regardless of the error message. In this case the routing function will not work.
- Reduce the map extent.
- Reduce the level of details.

Load pre-calculated routes on your Palm PDA

For this purpose, first run the routing function with the common settings. Please note that you have to use the Navtech (and NOT the Teleinfo) database for this calculation.

In the routing window, the results are listed as follows:



- Click now on the icon **Send route to Digi-Map**.
- The route will immediately be copied to the HotSync list of the selected Palm user and uploaded to your Palm with the next HotSync procedure.
- If no Palm user is selected in *QV*, a note will appear and then the dialog box for the **Palm Settings** will open from which you can choose the corresponding Palm user. Now, send the route to Digi-Map once again.

At present only one route can be calculated and sent to Digi-Map at a time. If you want to send several routes, the routes have to be calculated and uploaded one by one.

Load tracks and routes from Digi-Map to QV

You can also transfer routes created in Digi-Map and download GPS records to QV. These data will be saved in QV as tracks in a track table.

- First, press the HotSync key to transfer the data to your PC. The GPS records will be saved in DgMTrack.PDB, the routes in DgMRoutes.PDB, each in the backup directory of the

corresponding Palm user.

- Open the *QV X-plorer* and select a track table where the data shall be stored.

Now, for loading GPS records:

- Select **Digi-Map GPS records** from the pop-up menu **Download Tracks from GPS** .
- *QV* now imports the file DgMTrack.PDB and saves the tracks.

And for loading routes:

- Select **Digi-Map saved Routes (as Tracks)** from the pop-up menu **Download Tracks from GPS** .
- *QV* now imports the file DgMTrack.PDB and saves the Digi-Map routes as tracks.

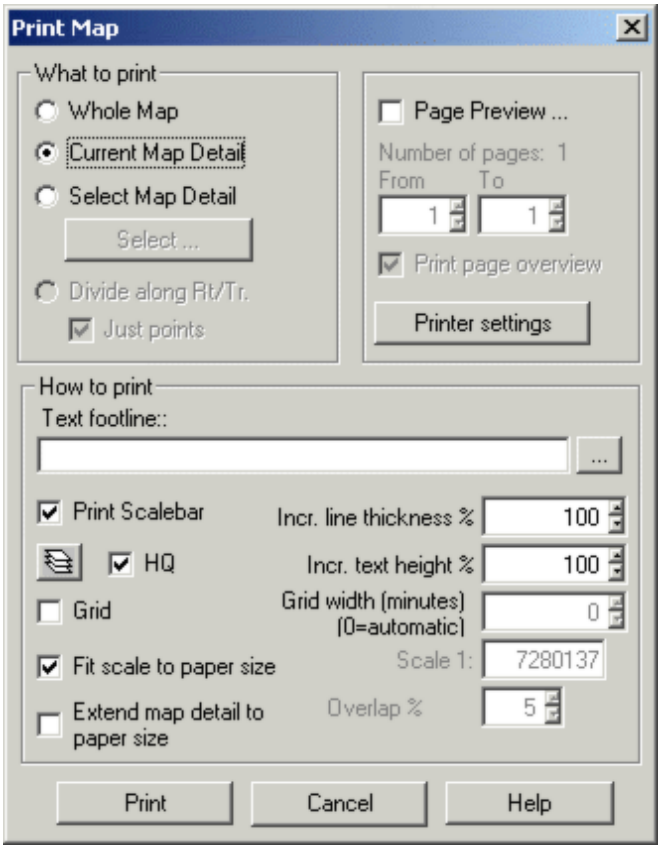
At present, the imported tracks include the coordinates but not the time and altitude.

Printing and exporting maps

Printing

The printing function in QV4 allows for an easy printing of any map extent at any scale on one or multiple pages.

Select **Print...** from the *File* menu in the main menu bar to open the printing dialog box:



In the map window the map extent to be printed is no shaded and indicated as a crossed rectangle. In its upper left corner the page number and total number of pages will be specified. So it is exactly shown WHAT will be printed.

Options of the printing dialog box

Whole Map	Selects the entire map as extent for printing. This option is not possible with all maps due to licence restrictions, for example not with the Top50 series and not with vector maps.
Current Map Extent	Selects the currently shown map section as extent for printing.
Select Map Extent	Click on **Select** to determine the map extent to be printed by moving the rectangle.
Split along RT/Tr	This option is available only if Multipage Output has been selected from the Track or Route menu (see there).
Page Preview	Opens another window with a preview of the print layout. Using the **<** and **>** buttons you can scroll through the pages.
Page From - To	If you have several pages for printing, you can select in these fields which pages you determine for printing.

Print page overview

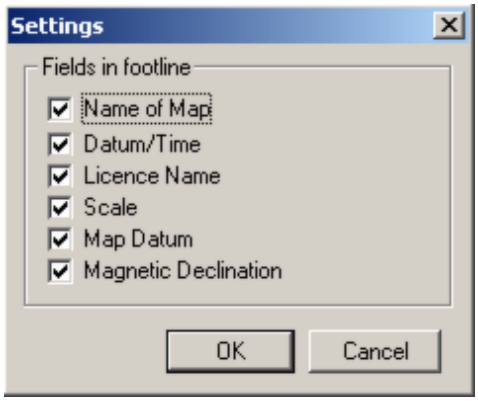
If you have several pages for printing, you can print an overview by enabling this option. This overview is identical with the multipage preview.

Printer settings

Using this button you can open a printer selection window where you can also choose and alter the paper size and format.

Text footline
...

In this fields you can enter a text which will be used as footline and be printed at the lower map margin.
... opens a dialog box which will offer you several options to add specific information to the footline such as map name, scale, date and time, etc.:



Only in QV-Prof. and QV-PU you can disable printing of the Licence Name in the footline. In QV-Standard and -Light, the Licence Name is always printed.

Print Scale Bar

Prints a scale bar along the upper and left map margin in the same layout as when plotted in the map window using **View - Scale** in the main menu bar.

HQ

This will enable printing of small map windows in a high quality mode. Due to memory restrictions, this option is not available under Windows 98 and ME.

Layer Manager

Opens the Layer Manager which allows for choosing various map objects. Only the maps, layers and marks which are selected and visible in the map will be printed. If you want to print special marks only, you can switch off all other layers in the Layer Manager.

Grid

Prints a grid as per the units currently set. The grid size can be changed in the field **Grid width**.

Grid Width

Enter the interval between the grid lines in minutes in this field. If you want to enter bigger numbers please convert to minutes and enter accordingly, e.g. *"600"* for 10° grid size.

Increase line thickness

This function is to adapt line width to your printer.

A track line which is 3 points thick and which looks good in the map window may appear very fine with high-resolution printers.

Enter a value here which will be added to line width for printing.

Increase text height % This function is to adjust the font size to your printer.

For example, a text in Arial 10 font type which looks fine in your map window may appear too small with high-resolution printers.

Enter here a value which will be added to text size for printing.

Fit scale to paper size If this option is selected, the map scale will be adjusted in order to fit the indicated map extent to the page size. However, a fixed scale can also be entered. In this case *QV* will distribute the defined map extent on several pages with the defined scale and automatically renumber the pages.

Every printout page will be indicated by a rectangle in the map window.

Overlap % Here you can enter to what extent the pages shall overlap (in %).

Fit map extent to paper size Adjusts the map extent for a perfect fit to the paper size.

Available printing options in the map preview

A very practical feature of *QV* is the preview of printout pages by one ore more shaded rectangles in the map window.

In this way it is clearly indicated what will be printed. Additionally, you can easily modify the placement of the pages by simply dragging the rectangles to a new place.

With a click of your right mouse button you can open a pop-up menu with the following print options:

Remove this page Deletes the selected page.

Add a page Creates a new print page which can then be moved to the requested position.

Zoom this page Zooms the map until it fits to the current print page.

Zoom all pages Zooms the map until all print pages can be seen in the map window. This layout will also be printed if you have selected **Print page overview** in the *Printing dialog box* (see above).

Note: If you change the settings in the *Printing dialog box*, the pages will be recalculated

and the page no.'s will be recalculated. So before you adjust the printout pages to the desired position, ensure that you have made all settings in the *Printing dialog box* first!

Printout

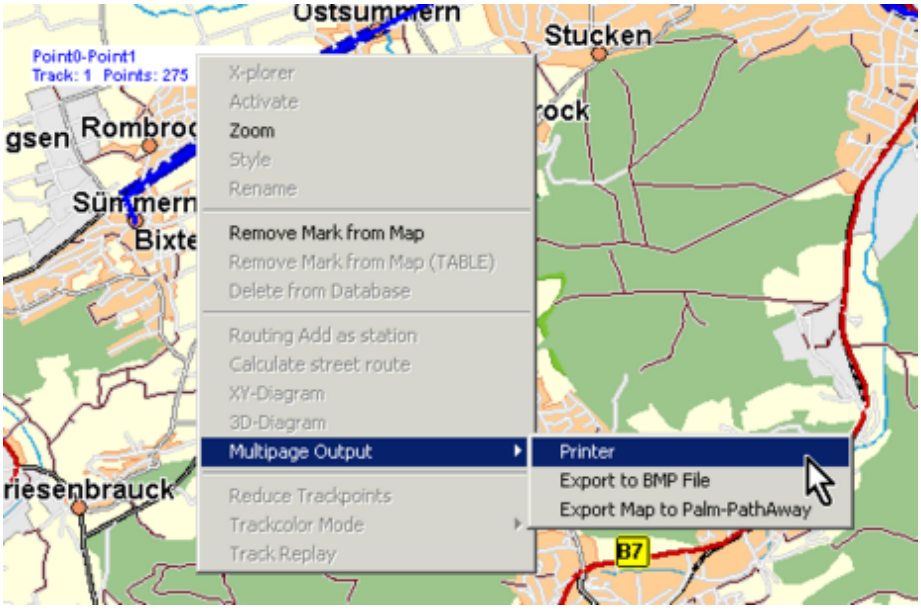
Initially you will need some time to adjust all settings properly. However, with a little experience, you will be surprised that it is just a matter of clicking the **Print** button to produce high quality printouts of the designed layout, even over multiple pages. This is the same task for Printouts or when using the **Export to bitmap...** or the **Export map to PDA PathAway ...** function. For the latter two functions *QV* will automatically add a consecutive number to the specified file name in cases of Multipage Outputs. When printing, a numbering (following an xth from a total of y pages convention) is added to the footline.

By default, the *Print Map* dialog box will close automatically after clicking the **Print** button. However, if you prefer to keep this box open for further printouts, you can change this under **Options - Settings - General**. There you will also find an input box named **Printer memory** which controls the memory requirements for the printing job. *"0"* will result in printing of many separate batches with very limited memory requirements; *"9"* will print all in one batch but with extensive memory requirements. If you end up with empty pages when printing on huge paper sizes and with high resolution you should decrease this setting.

Multipage Printout

This function allows for a multipage printing along a given route or track.

Since the multipage function is closely related to routes and tracks, it is only accessible from the route and track pop-up menus which open when you right-click on a route or track in the map window.



The function is available in three different options:

- **Printer**
  Will send the printouts to the printer.
- **Export to Bitmap**
  Will generate a bitmap file on your hard disk drive.
- **Export Map to PDA PathAway...**
  Will create a PathAway compatible map.

Select one of the three options (Printer / BMP / PathAway) and the standard output window opens (see *Printing*) which will now be extended by the two multipage options:

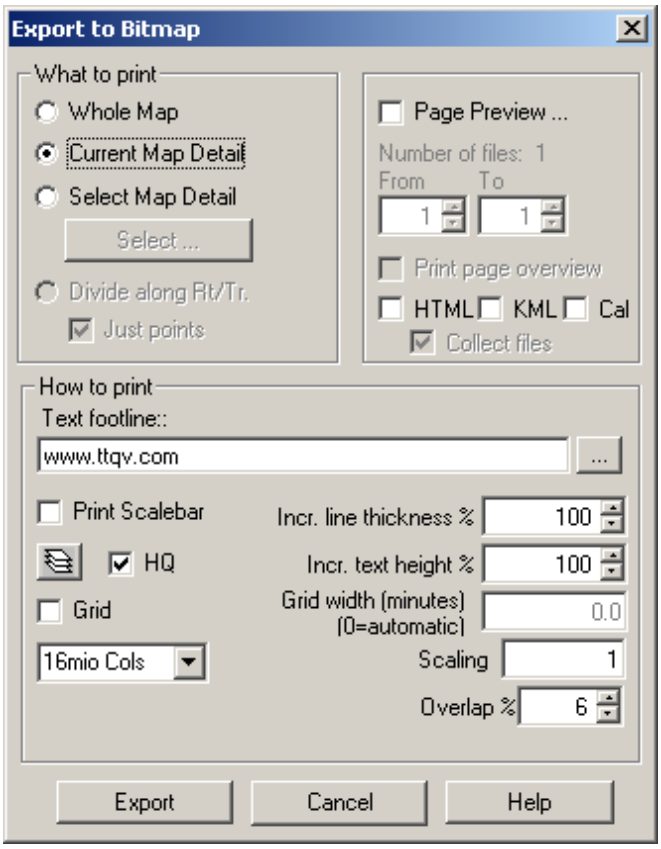
Overlap % This value specifies how much overlapping occurs in the printout. 0% will result in a printout without overlap, otherwise the overlap will increase with the specified value.

Just Points If enabled, the pages to be printed will only be defined by the route-waypoints or the trackpoints. Otherwise the connecting lines will also be considered in order to guarantee a seamless printout.

Export to Bitmap

This function works similar to the **Print** function.

The only difference is that the map is not sent to the printer but is converted to a *BMP*, *PNG* or *JPG* file and saved on your hard disk drive.



Scaling Scaling factor for the output datafile. The scaling factor defines the map size in the output file:
A factor of 1 will result in the original map size. A factor of less than 1 will result in a reduced size and a factor of bigger than 1 in an increased map size.

In the title line of the map preview window the image size in pixels will be listed.

Colors Defines the color resolution of the bitmap. The bitmap format is defined by the file extension. You can choose between *BMP*, *PNG* or *JPG.*

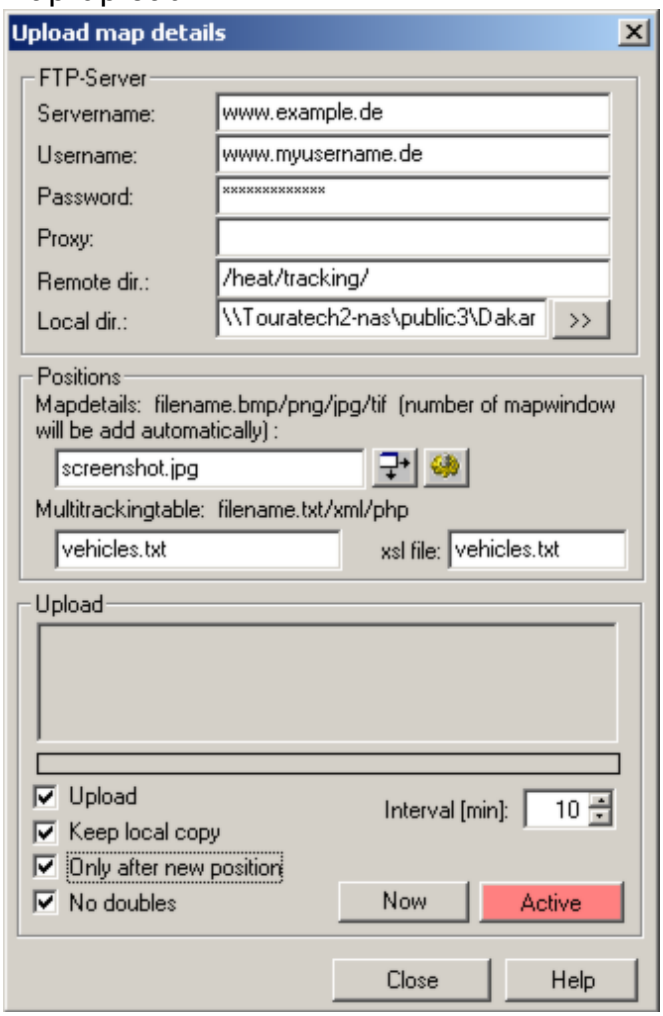
HTML If this button is enabled, a HTML file will additionally be created which can be used together with the bitmaps as a the framework for a website. In case of a multipage layout the overview will contain a map image for the various detailed maps.

Sampling files:
If the export contains embedded marks with links, the links will also be active in the output file. If you enable this switch, all related documents will be copied to a directory with the default name *Bitmap_Name_FILES*. So all required files can easily be transfered to a webserver.

KML Creates a KML file in order to georeference an exported map for a subsequent Google Earth import. See Google earth.

CAL When selected, a CAL-file will be created together with the bitmap-file.
With this, you can easily re-import the bitmap as a new map without the need to calibrate it again.
Useful e.g. to store parts from ECWP-maps locally.

Map upload



This function allows for map uploads at user-defined intervals to a server in order to update a web presentation.

For this purpose screenshots will be generated in the defined time intervals.

This function is started from the **Multitracking** menu by selecting **Map upload**.

Similar to the **Export to bitmap file** function a screenshot will be taken from every opened map window including alls visula marks. These files can be sampled on yopur hard disk and additionally be uploaded to a webserver.

Furthermore, in each map window a text file will be plotted which lists the coordinates of all monitored vehicles.

Specify the name of the map under **Map details**, the no. for the corresponding map window will automatically be used as a prefix. The format for the screenshot will be defined by the file extension. BMP, PNG, JPG and TIF are supported formats.

Specify the name for the textfile listing the actual positions in the field **Multitracking table**. The no. for the corresponding map window will automatically be used as a prefix. The format for the textfile will be defined by the file extension. TXT, XML and PHP are supported formats.

If you want the maps to be uploaded to a server, specify all Log-on parameters in the **FTP-Server** mask and enable the **Upload** switch. In this case the uploaded files are always named the same, e.g. *1screenshot.png*. This results in an automatic replacement of the previously uploaded file. Thus, as website presentation can dynamically be updated.

Of course an Internet access is essential for this function! Otherwise just leave the **FTP-Server**

mask empty.

If you want to archive the files on your local hard disk tick-mark the button **Keep local copy**. In this case the files names will automatically be extended by a date/time stamp, e.g. *1screenshot_20040804_112214.png*.
Please note that this archive function will require extensive hard disk capacities over the long run! Pe adviced to keep an eye on the remaining hard disk memory.

After finsihing all settings, specify a time interval and start the function by clicking on the **Active** button. Now you can close the window, the function will work in the background. This will be indicated with the tick-mark in the **Multitracking** menu in front of the **Map upload** option.

FTP-Server	Log-on parameters for the FTP server.	
	Server name	IP address or host name of the server.
	User name	User name for the user's access on the server.
	Password	Corresponding password.
	Proxy	If data communication is controlled by a firewall, you can specify the IP address or host name of your Proxy here. Otherwise leave this field empty.
	Remote dir.:	Specify here the directory of the server to which the data should be uploaded. It is essential that this directory is existing and that you follow upper and lower case spelling!
	Local dir.:	Specify here the local directory on your hard disk in which the copies should be stored. Ensure that sufficient storage capacity is available. Click on >> to open a file selection box where you can choose a directory or create a new one.
Map detail	File name of the screenshots. The no. for the corresponding map window will automatically be used as a prefix. The local copy will be extended by a date/time stamp. The format for the screenshot will be defined by the file extension. BMP, PNG, JPG and TIF are supported formats.	
	Opens the Export dialog box in which you can define all parameters for the bitmap file such as grid, scale, footline text, etc.	
	Opens a dialog box for defining the size of the map window. Using this option you can ensure that all screenshots have exactly the same size.	
Multitracking table	File name for the textfile listing all positions. The no. for the corresponding map window will automatically be used as a prefix. The format for the textfile will be defined by the file extension. TXT, XML and PHP are supported formats.	
Upload	Enable this switch if you want the files to be uploaded via FTP. A progress bar, status messages and errors will be listed in the field above.	
Keep local copy	Enable this switch if you want the files to be locally archived.	
Only after new position	If activated, new screenshots will only be generated if new positions were detected since the last upload.	
No doubles	If activated, new screenshots will be compared with the previous ones. If identical, e.g. due to an unchanged vehicle position, they will be ignored.	

Interval	Specify the time interval here in which you want screenshots and uploads to be executed. Note that the function must be activated in order to be executed (see below). Note: Rather the specifying an interval here, you can also define an Event and this as an Action. See chapter Event/Action.
Active	Only if this switch is enabled, the screenshots and uploads will be executed. Clicking on this button a second time will disable the command (switch function).
Now	This button will trigger the execution of all selected actions once.
Close	Closes the window. Note that if enabled, the automatic data processing will continue!

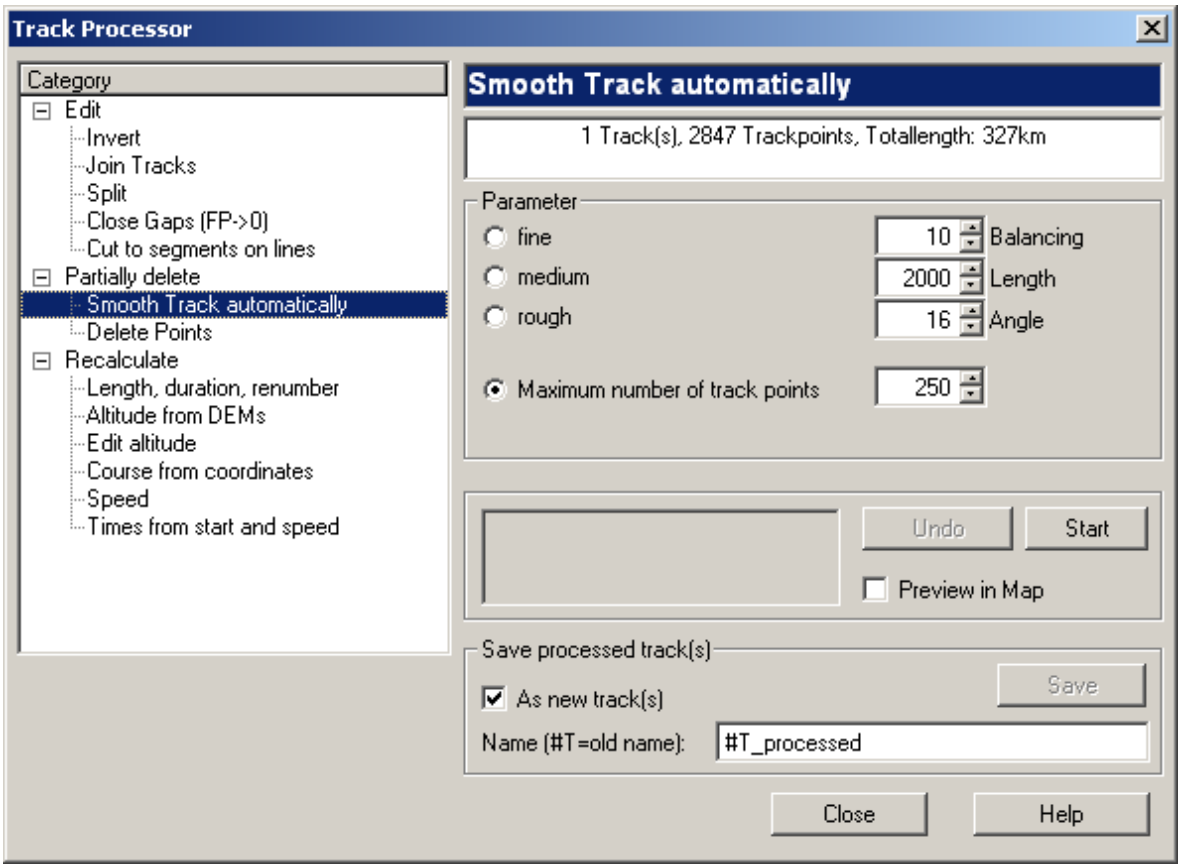
Track analysis

Track Processor

The Track Processor is a powerful tool for post-processing of tracks. Many options for track modifications are available, including a simultaneous transformation of multiple tracks:

- Recalculation of speed, altitude, heading and time
- Deleting of points according to various criteria
- Splitting into segments in regular intervals or at specific intersections
- Simultaneous transformation of multiple tracks

The previous QV 3 functions **Reduce trackpoints** and **Splitting of Tracks** have now been summarized together with the new functions in the *Track Processor*.



The processing can be divided in 4 steps:

1. First of all, you have to specify one or more tracks in the *QV X-Plorer* which you want to process. Then choose **Track Processor...** from the pop-up menu which you access by a right-click on the track name or by clicking the icon.
2. Select the desired function from the list on the left in the *Track Processor* window. Optionally you can define the relevant parameters to the right of the window.
3. Click **Start** to trigger the data processing.
   By clicking **Map Preview** you can control the effect of the processing in the map window.
   If you are not satisfied with the result, click **Undo**, change the parameters and repeat the processing with the **Start** button.

4. If the result satisfying, save the track editing with the **Save** button either as a **New Track** or by overwriting the existing track(s).
   If you choose **Save as new Track**, you have to specify a new track name. Use the joker *#T* for replacing the existing track name. If the result of the track processing are numerous tracks, *QV* will automatically use a consecutive numbering.

Editing of tracks

Invert Reverses the track

Join Tracks After selecting several tracks you can merge them to a single track which will contain all trackpoints in the original order.

Split

Splits a track into several ones. Enter the no. of points per track and the no. of overlapping trackpoints.

This function is identical to the **Split** function in the QV3 track menu.

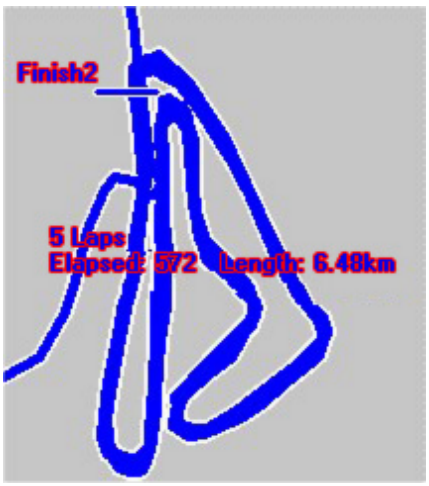
Close Gaps Resets the FP variable of all trackpoints to 0, resulting in a single trackline with all points connected (no breaks).

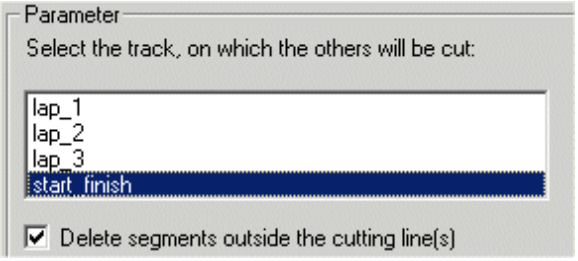
Cut to segments at break lines

This is a powerful function which allows for cutting extended tracks into separate ones. This is very useful if you want to compare several turns of a race or your jogging activities.

In order to compare these turns with the XY diagram, QV will need each round as a separate track which must start and end at the same position. You can achieve this using the track processor and cut the original track at a start or an end line.

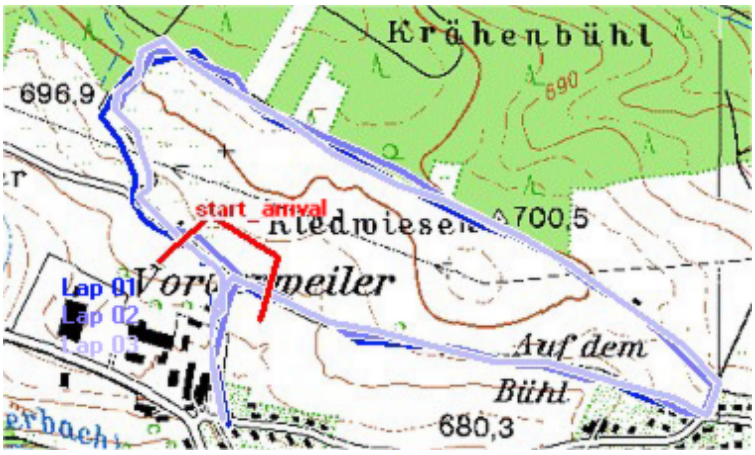
First of all, you have to define a break line manually as a track in the map window. Below you find an example with many rounds where the intersecting trackline has been named "Arrival2":

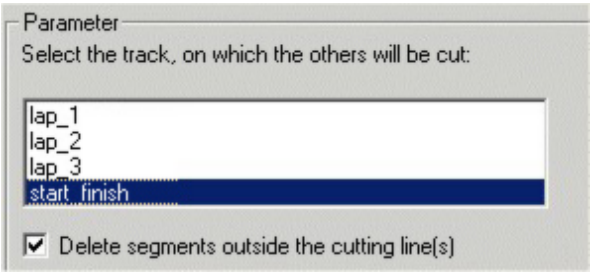




Now you have to select the original track and the intersecting track line in the *X-Plorer* and start the *Track Processor*. Then choose the function **Cut to segments at break lines** from the *Track Processor* window. Now define the track which should act as break and click the **Start** button. Now the track named *"5 Laps"* will be cut at the intersecting track line defined as *"Finish2"*. The result of the track processing will be separate tracks with the individual turns and the intersections before and after the first and last crossing of *"Finish2".* If desired these remaining segments can automatically be deleted by tick-marking *Delete segments beyond the break line.*

Example for generating separate tracks from multiple turns:



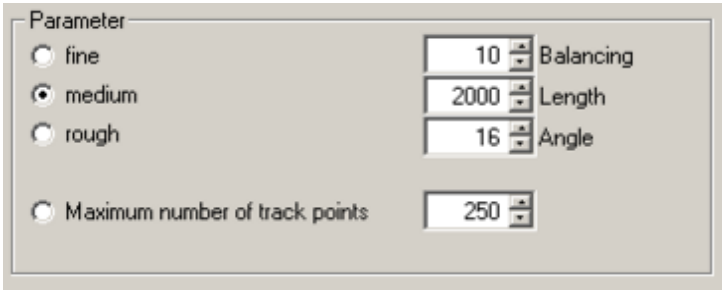


And this is the result:

Partially deleting of trackpoints

Smooth Track automatically

This function is identical to the QV3 function **Reduce Trackpoints**.



You have for options for smoothing a track: Balancing, Length, Angle or point no.

Balancing

If the distance between two neighbouring trackpoints is below the defined threshold, one will be deleted.

Length, Angle

These parameters are linked and will be analyzed simultaneously. If the distance between two points is below the defined *Length* threshold and the heading has changed less than the defined *Angle* threshold, one point will be deleted.

In the example given above, on highways with view turns only trackpoints every 2 km will remain after processing while on small winding roads with many turns with a change in direction of more than 16° much more trackpoints will remain.

Fine, medium, rough

Selects one from three predefined profiles.

However, you can also alter the settings and define the parameters according to your needs.

Delete Points

In this menu you can delete trackpoints according to a specific interval (every X-th point) or delete individual points from no. X to no. Y.

Recalculate tracks

Length, duration, renumber

After editing of tracks, the total length and duration and also the numbering of the trackpoints can be recalculated using this function.

Altitude from DEMs

Normally the *Altitude* column will contain the measured altitude values from the GPS receiver.

In cases where altitude information is not available you can calculate altitude values from the *DEM* (digital elevation model). This requires that you have installed a suitable *DEM* in your *QV* system.

By default, also existing altitude values will be overwritten. However, by disabling the **Overwrite existing altitude values** switch you can also use this function to fill trackpoints where altitude is missing just due to a bad satellite coverage. In this case only altitude values equal to "0" will be overwritten.

Edit Altitude

Using this function, you can edit all altitude values of a given tracks.

Two options are available:

Multiply - All values will be multiply with the defined coefficient

Add (Scale shift) - a constant factor will be added or subtracted.

Course from coordinates

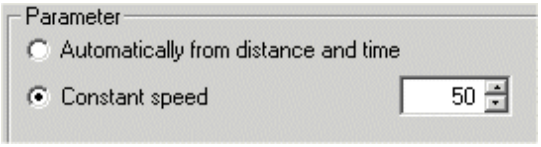
With tracks recorded through the GPS Online mode, the *Course* column will contain the heading values as measured by the GPS receiver. Tracks from other origin may contain "0" in the *Course* column.

Using this function the course will be calculated from the consecutive trackpoints and be stored in the *Course* column.

Speed

With tracks recorded through the GPS Online mode, the *Speed* column will contain the speed values as measured by the GPS receiver. Tracks from other origin may contain "0" in the *Speed* column.

Using this function speed will be calculated from the consecutive trackpoint distances and the time interval and be stored in the *Speed* column (Option: **Calculate from distance and time**)

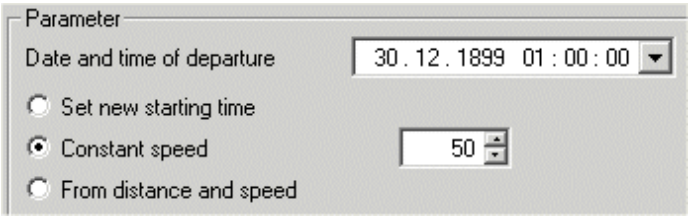


As a second option you can also assign a **Constant speed** to all trackpoints.

Times from start and speed

Using this option you can assign a new time scale to the trackpoints.

For this purpose you can enter a starting date and time and the time for all consecutive trackpoints will be recalculated accordingly.



There are three options for recalculating the trackpoint times:

Set new starting time: In this case the time scale will only be shifted according to the new starting point. Time differences between points will not be changed.

Constant Speed: A constant speed is assumed and the trackpoint times will be recalculated from the starting point and the cumulative time needed to cover the distances from point to point with the defined speed.

From distance and speed: Speeds between trackpoints are calculated from distance and time intervals and trackpoint times will be recalculated from the starting time and the cumulative time needed to cover the distances from point to point with the calculated speeds.

Track Replay

This function replays a track on the map in real time or in fast motion.

In this way you can observe when you have been travelling where, and how fast you were driving an in which direction you heave been heading. You will follow your journey once again on the map.

First of all, you must select the track and plot it on the map. Then, right-click on the track on the map and select **Track Replay** from the *Track* pop-up menu.

The track replay window will open. You will see a speedometer, a clock, an altimeter and a button bar similar to a video recorder with start, fast forward, pause and stop. Next to it is a slider which controls the playing speed. On the button of the window you find a progress bar that functions as a tape counter.

In detail:

The speedometer is set automatically to the speed range covered by the track. Speeds are displayed in the dimension as specified under **Settings - Units**. If you change the unit, e.g. from km/h to miles/hr, you must replot the track and restart the track replay mode.

While track replay is running, the speedometer shows the speed at the current position and the clock specifies date and time of the position (PM identifies the afternoon, AM the morning hours).

In addition, an altimeter is available. If altitude data for the trackpoints are available, they will be shown on the altimeter. Intermediate altitude data will be interpolated, and this value should be "0", the altitude will be extracted from the DEM data.

You can control the playing speed with the slider. When the register is on the far left, the track replay works in real time, i.e. if the track lasted 5 hours, the replay will also last 5 hours. If you move the slider to the right, the replay will run in fast motion. For example a ratio of 300:1 will result in a replay lasting for 1 minute when the original track took 5 hours.

To start the replay function, press the *Start* button, *Pause* will interrupt it, a second push on the *Pause* button will continue the track replay. *Stop* finishes it and *Fast Forward* performs a quickly play forward.

While track replay is running, you can press *Start* once again to skip to the next trackpoint. This helps if there are long pauses between trackpoints. If *Pause* is pressed simultaneously with *Start*, a sort of frame by frame progression is performed.

With very long tracks, you may not want to play only the interesting phase somewhere in between. In this case you right-click on the track in the map window at the position where the track replay should start and choose **Track Replay from here...** from the pop-up menu.

The symbol for the current position can be changed under **Settings - General**. When choosing an arrow symbol, the location indicator will show the heading along the track. See chapter "Settings - General".

You can also combine track replay with a color-coded track plotting or link it with the XY diagram or the 3D diagram display. To do this simply open the diagram window for this track before starting track replay. If you run track replay now, the vertical line follows the XY diagram and an arrow follows the current position in the 3D diagram.

When activating the *Realtime* switch, the track will always be replayed in real time. When this switch is disabled, replay will skip from trackpoint to trackpoint without accounting for the speed of driving.

By enabling the *Loop* function, the track replay will start from the beginning after reaching the end of the track.

Save track replay as video clip

When pushing the record button, an AVI file will be created and a video clip is generated which can be replayed without the need for a *QV* installation. As long as the button is pressed, frames will be created with each movement of the arrow. The number of frames and the current frame rate will be shown in the title line of track replay window.

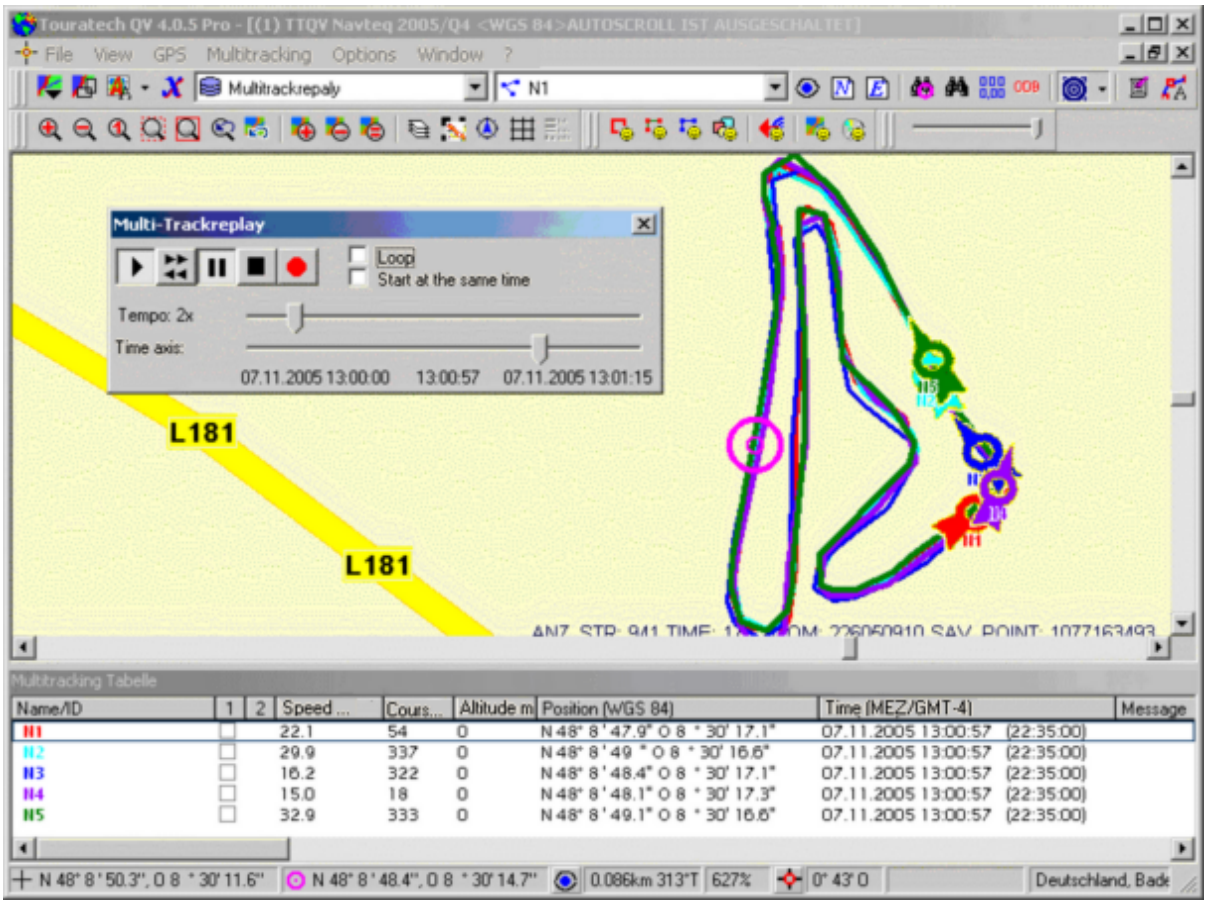
Please note, that the AVI files can become very big. Please watch the amount of available hard disk space.

When starting the function a codec can be selected. All codecs which are available in your system will be listed for selection.

Multi-Trackreplay

This function has been implemented in order to compare several tracks such as competitors in a race or several rounds of a training course.

The tracks can be replayed synchronously with a standardised time scale, even if the tracks have originally been recorded at different times.



Color-coded Tracks

Using this function, you can color code a track according to speed (horizontal or vertical), acceleration, altitude, slope or age.

Several options are available in order to control the plot style of the track which you can access by choosing **Trackcolor** mode from the *Track menu:*

Normal

The track will be plotted as solid line with the selected color and a shading effect (margins in background color).

The selected color can be defined with the option **Color** or **Style** from the *Track menu* (see below).

Speedcolors

Altitude

Acceleration

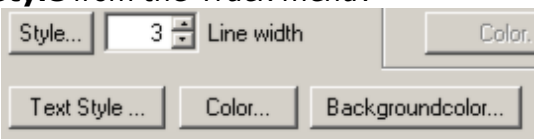
Vertical Speed

Gradient

The track line will be color-coded according to the speed / altitude / acceleration / vertical speed / slope at the given trackpoint.

01010

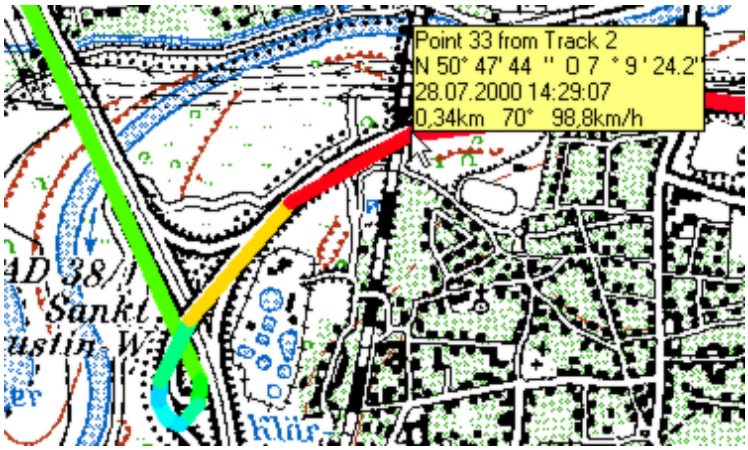
The track will be plotted as dashed line with the selected and background color alternating. The selected color can be defined with the option **Color** or **Style** from the *Track menu*:



Age

Using this option, a time interval can be specified and the track will be color-coded according to the age of the trackpoint.
Please note that this option is only meaningful during online mode and multitracking applications.

Example for color-coding according to speed:



The corresponding color spectrum is predefined and ranges from black over blue - cyan - green - yellow - orange - red to purple where black codes the minimum and purple the maximum speed.

Using the two adjustable bars you can set the margins for the color scale and the narrow bar to the top will reflect the chosen color scale (in the example ranging from dark blue to light red).

In the data fields to the left and right you can enter values for the minimum and maximum speed which will be assigned to the extremes of the color scale.

QV will calculate the speeds and assigns the corresponding color to the track segment ending at

the second trackpoint of each track section.

Google Earth

Google Earth interface

With *QV* you can transfer GPS data and map windows to Google Earth.
First of all, Google Earth must be installed. It can be obtained free of charge from here http://earth.google.com/.

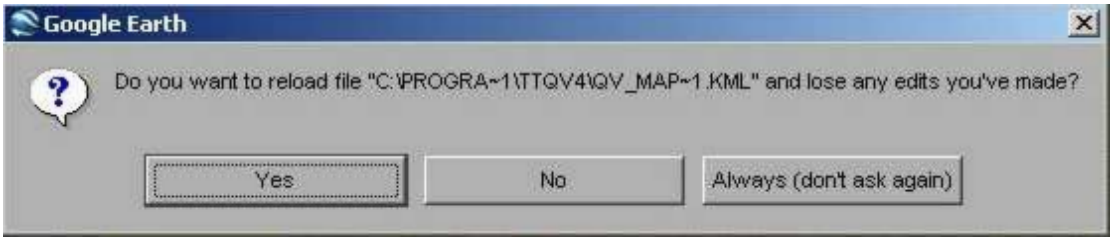
There are two levels for working with Google Earth in QV.

Quick and simple

You will find three commands in the Google Earth toolbox or in the QV main menu bar under **Options - Google Earth**:

Centre map cursor		Rotates the GE globe in order to center the *QV* map cursor.
Show map window		Projects the current QV map window precisely into the GE globe
Show markings		Projects all QV markings that are currently loaded on the map into GE.
Zoom GE-view in QV		Zooms the map in QV to the currently visible mapdetail of GE

Note: QV writes the data to a qv*.kml file that is subsequently opened by GE. As this file is always named the same, GE will respond for the second time with the following query:

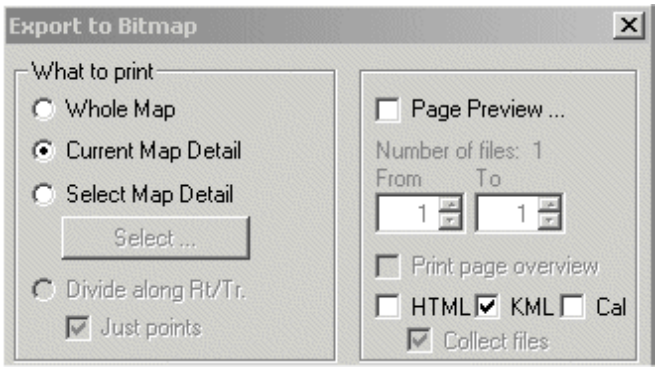


Just select **Always (don't ask again)** and then GE will just proceed automatically from now on.

Quick too but with more options

Transfer map windows accurately

With this command you can export any printable map window to GE. Just call up **File - Export to bitmap file...** and set all the required options. See also Export to Bitmap file.



Then tick-mark **KML**.

Then click on **Save** as usual and specify the bitmap export file name.

Now the bitmap will be generated.

In addition a KML file with the same name will be created in the same directory with the calibration information and a KMZ file.

These files can then be further processed in any way you like.
You only need either the KMZ which already contains the bitmap or the KML file together with the bitmap.

If you want to publish exported map in the Internet, please make sure that you respect the map manufacturer's copyrights. Many maps that can be used and exported in *QV* are not intended for publication.

Export markings

You can export all routes, tracks and waypoints from QV to GE. This is done from the *QV X-Plorer* with the normal export functions.

Just highlight the required data and select Google Earth from the export menu. You can also choose more than one file or even whole tables. Now specify a file name and *QV* creates the KML file for further use in GE.

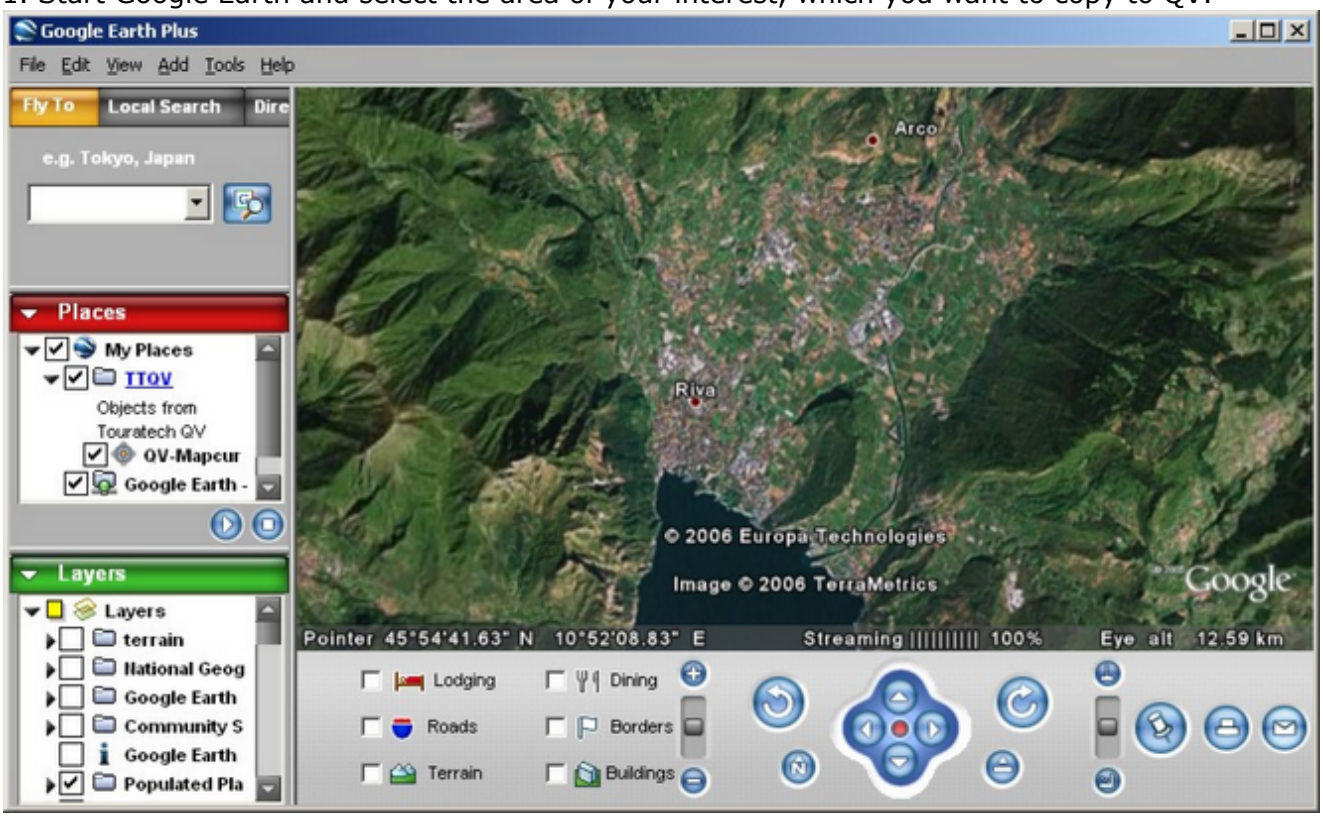
colors and line strength will be retained.

Capture mapdetails from Google Earth to QV

You can capture any mapdetail from Google Earth to TTQV. The mapdetails are copied and can be used in QV as normal maps without Google Earth.

Start like this:

1. Start Google Earth and select the area of your interest, which you want to copy to QV.



To get the calibration correctly in QV, it is important that you switch off 3D in GE:

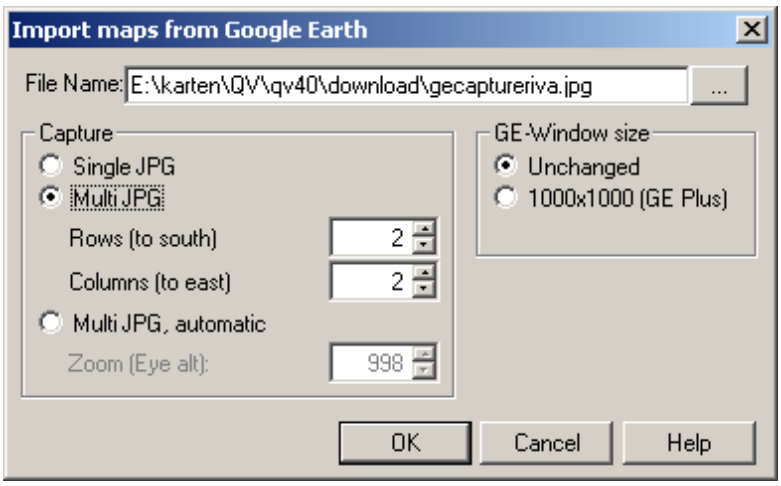
So remove checkmark at **Terrain**:

, click on **Reset North** and also on **Reset Tilt** , to get the current view exactly from the top and orientated to the north.

2. As next step select in QV in X-Plorer a maptable, in which the new map should be stored.

3. Then select **Import maps from Google Earth...** from the Popup-Menu of the maptable.

The following dialog opens:



Filename Enter path and name for the new map. The maps are always JPGs.
If you select Multi-JPG, row- and column numbers are added automatically to the filename.

Capture:

Single JPG Only a single JPG will be saved, exactly like the currently visible mapdetail in GE.
In QV-standard only this option is available.

Multi-JPG Starting from the current view in GE, QV captures as much rows and columns as entered in the here.
To capture a larger region, select the upper left corner in the desired zoom and enter the numbers of columns and rows, you want to capture.

Multi-JPG automatic This is the opposite way.
Here you first select the total region, you desire, lets say, the overview.
Then you select the zoom factor in "Eye alt". You see the value for "Eye alt" in the statusbar of GE:

In QV this value has to be entered always in Meter in the field **Zoom (eye alt).**

To capture Multi-JPGs, you need a QV-PowerUser-License.

Window-size, selects the size of one tile:

Unchanged as currently is in GE

1000x1000 QV enlarges the GE-Window to 1000x1000 Pixel. This is only possible with Google Earth Plus

Click **OK**, and the process starts.
Now QV remote controls GE. Step by step all mapdetails are selected and captured as screenshots. Please keep your PC untouched while this is running.

Tip: Purchase a license of Google Earth Plus. With this you can capture 1000x1000 at a time. The freeware version can only capture a much smaller area.

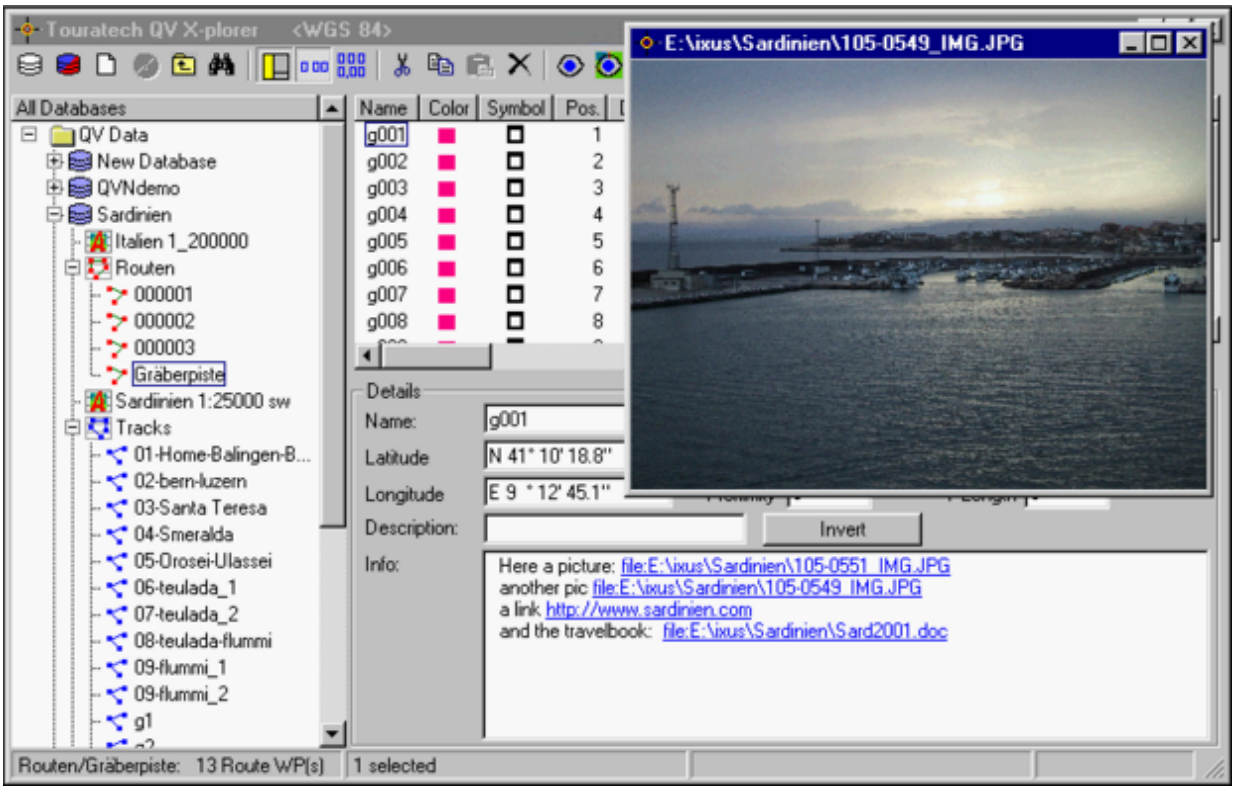
After finishing, you will find the new map in X-Plorer.

Linking external documents

Links

QV can save links to external data for each waypoint, route, track and map. This is done by simply entering the links in the Info field.

which has been considerable extended in terms of functions in this version.



As usual, you can write any text in the info field. However, if you enter a file name or an Internet address, *QV* will identify this as a link which is indicated by blue characters and underlined notation.

Then you only have to left-click on the link and the link will open.

It will depend on your system configuration what will happen when executing a link. If, for example, you click on an Internet address, i.e. a link that begins with http: your standard browser will open, i.e. *MS Internet Explorer* or *Netscape Communicator*, depending on what is installed on your PC.

If you click on a file, i.e. a link that begins with file: the standard program for this file type will open. For example with the file:c:\tmp\test.DOC this document would open with *MS Word*. Or with file:c:\Maps\ an *MS Explorer* window will open and the content of this directory be displayed.

As a rule of thumb you can assume that exactly the same will happen as if you click on this link in the *MS Explorer*.

Entering Links

A **Drag&Drop** operation is the simplest way to enter a link. Just drag a link from your browser or a file from the *MS Explorer* into the info field.

You can also enter links manually.

Links must start with a special identifier in order that *QV* will recognize this as a link command. These are:

http: Internet addresses, e.g. http://www.ttqv.com. You can also simply copy a URL from the address bar of your browser and insert it here using the Windows clipboard.

file: Files or folders e.g. file:c:\tmp\test.bmp or file:c:\tmp\.

Note: **No spaces are allowed!**

mailto: An e-mail address, clicking on this opens your mail program and you can write a new message to this address, e.g. mailto:service@ttqv.com

File links can be added very easy with the **Add files** function from the info field pop-up menu. Just right-click in the info field and select **Add files** from the menu.

The following file selection box allows multiple selections. If you want to link several pictures to a track you can mark them individually with a left-click of your mouse while holding the **Ctrl** key down and thus allocate them all in one batch.

The selected file(s) will be inserted into the info field at the current cursor position.

If you select files with this function, *QV* converts them automatically into the old DOS short annotation form (aaaaaa~1) so that they can be recognized as links. As we have said, spaces in the file or path names cannot be interpreted and are therefore not allowed.

Standard paths for links to external documents will now be saved in the *qv.ini* file under *doc_dir=* ... and can be changed here.

Given that the path is entered under *<QV-installation_path>\doc,* the shortened form of external documents can be entered in the info field , e.g. file:test.bmp for the bitmap c:\programs\ttqv\doc\test.bmp or file:1\index.htm for a document c:\programs\ttqv\doc\1\index.html

The advantage of this feature is that QU4-files become portable if the directory structure of external documents are copied, too.

Editing of Links

A link is nothing else than a text in the info field that is interpreted as a link. Thus, you can also edit this text like any other text. It can be highlighted, copied, inserted and deleted. Of course, a link should only be edited as a whole. If you change the text within a link, *QV* will possibly not be able to relocate the corresponding file.

Moreover, if you copy data in the *QV X-Plorer,* i.e. a waypoint or a route to another point or route, the links in the info field will also copied.

Links to photos

QV can view photos in the JPG, BMP, GIF, PNG and TIF format in a separate window without the need of external tools.

This window can be placed anywhere within the QV main window and also be changed in size. The picture is always scaled for a complete view within the window. The photo will also keeps its proportions.

To open the photo with your standard bitmap viewer / editor, e.g. *Photoshop*, simply double-click within the window.

Alternatively your standard bitmap viewer / editor can also be opened directly. To do this, remove the tick-mark *External documents: show bitmaps internally* under **Options - Settings - QV X-plorer**.

Map Links

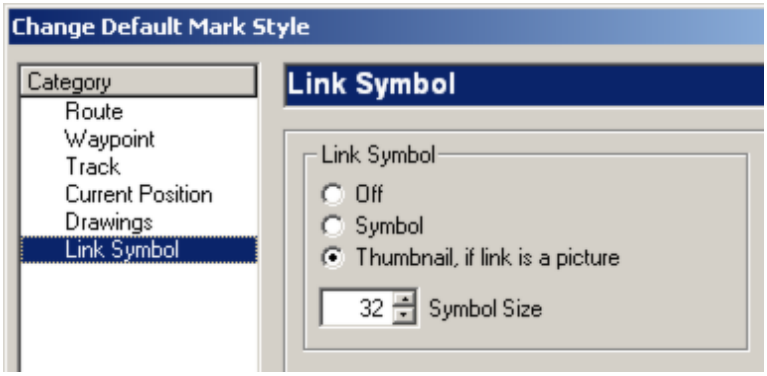
External links, i.e. files or web-addresses which are specified in the info field of a mark, are indicated by an underlined name. The mouse pointer will change to a hand symbol when moving over such a link. A mouse click will open the link directly; however, if several links have been assigned to a mark, a pop-up window will open from which you can choose the desired link.

The symbols can be placed freely on the map. In order to clearly indicate the exact location to which the links are assigned, a thin line will connect the link with the corresponding point.

Link symbol

The link can be indicated in the map with a symbol. This can be done under **Style** from the mark pop-up menu or directly in the detail window of the *X-Plorer*.

See Style - Settings for Marks.



This box applys to waypoints, routes, tracks and drawings. Here you can specify if and how linked documents are indicated in the map display.

Off No symbol will be displayed.

Symbol The standard symbol for this file type will be displayed. This is the symbol which is also used by the *Windows Explorer* for this file type.

For photos a camera icon is used as a symbol.

Thumbnail if link is a picture If a bitmap is linked, *QV* can generate a miniature of the photo which will be stored as *name_qv.ext* in the *qv_thumbs* directory. This miniature will be displayed in the map and also be plotted in a printout.

Symbol size In this field you can specify a symbol size in pixels.

Photos

Digital photos and tracks

If you document your trip using a digital camera and log your GPS track at the same time; QV can later on assign the photos automatically to the tracks.

Two conditions must be fulfilled for this function:

- The trackpoints must be labeled with date and time. Many GPS units such as the Garmin will do this by default. However do not use the *Track Save* command because the Garnin units will then drop the time information! Just download the standard tracklog.
- Your digital camera requires an internal clock and stores date and time with the photo. Of course you should synchronize the clock of your digicam with the GPS time! The photos must be stored in the JPEG format. If no EXIF block is available, QV will refer to the date and time information encoded in the file.

Automatic assignment

The assignment is done in four steps:

- Select the requested tracks to which the pictures should be assigned to in the *QV X-Plorer*. You can also select several tracks at a time.
- Click the *Special function* icon and choose **Digital camera pictures - Automatic assignment by time**.
- Choose the desired pictures (JPG) to be assigned from the following dialog box. With the *Ctrl* or *Shift* key you can select several pictures at a time.
- Finally you have to enter two further values and confirm by clicking **OK**.

Time difference	Enter the time shift between GPS and camera time (in seconds), in case that the clocks have not been synchronized.
Maximum Time difference:	Normally *QV* will assign the picture to the trackpoint with the smallest time difference. However, if this time difference exceeds the value specified in this field, the picture will be ignored.
Create a miniature automatically:	If you want to display miniatures of pictures on the map, you can now create them using this function. Otherwise these can also be created later on.

Calculating the time difference

If you are not sure whether your GPS and digital camera clocks run synchronously, the first thing you should do is to determine the time difference.

For this purpose, use a photo from which you know the accurate location.

- Click on the trackpoint where the picture has been shot in the *X-Plorer* list window.
- Click the *Special function* icon and choose **Digital camera pictures - Calculate time difference GPS - photo time (Trackpoint)**.
- Select the corresponding photo from the dialog box which now opens.
- *QV* will now calculate and displays the time difference.
- You can now run the automatic assignment function without caring for this time difference, *QV* will automatically account for this time shift.

Trackpoints with linked photos

Some help functions are available in order to find trackpoints with linked photos easily.

In the X-Xlorer *list window* each trackpoint with an assigned photo or with another link is marked in green. This way, these points are eye-catchers while scrolling through your trackpoint lists.

In addition, there are two further buttons ▲ **a**nd ▼ in the *X-Plorer* details window. Using these

buttons you can easily skip to the previous or next trackpoint with an implemented link.
Links can be highlighted in maps by symbols. The corresponding settings are defined under **Style** in the track pop-up menu which you can access with a right-click of your mouse on the track.

Removing of a link

Photos which have been assigned automatically to a trackpoint, can also be automatically removed.

- Select the tracks from which the assignment should be deleted in the *X-Plorer* .
- Click the *Special function* icon and choose **Digital camera pictures - Delete assignment.**

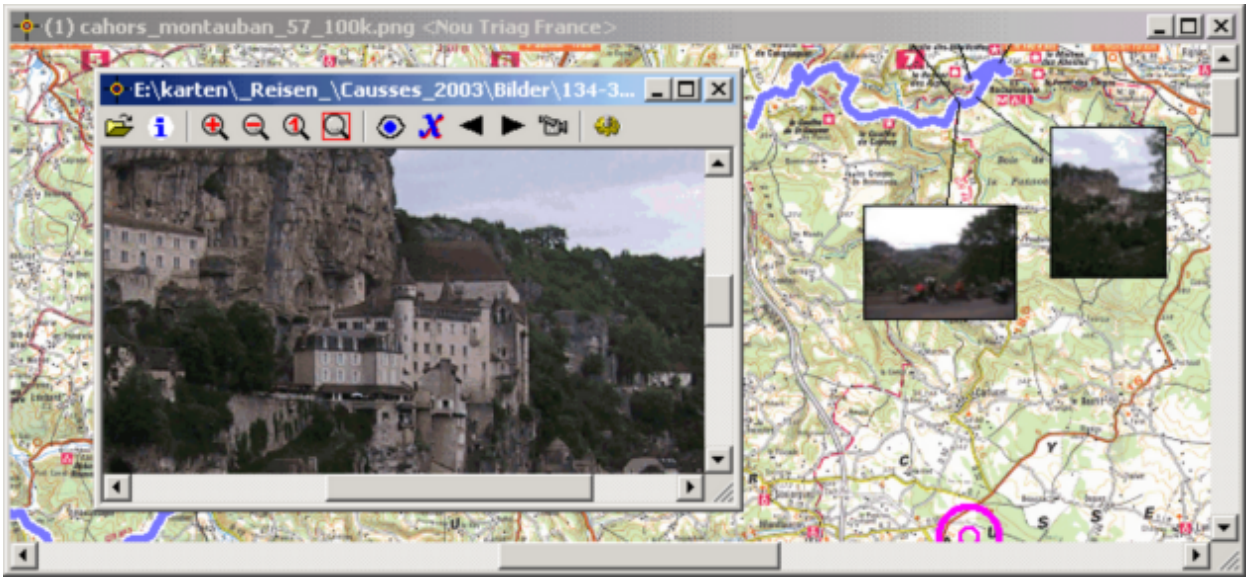
Assignments which have been set manually remain untouched. These can only be removed by deleting the corresponding link in the *X-Plorer* details window.

Slideshow

Bitmap viewer and slideshow

If you click on a linked photo, the bitmap viewer will open and show the photo in full resolution.

However this requires that link is addressed to a photo and that you have enabled the option **External documents: Show bitmaps internally** under **Settings - X-Plorer**.



The following options are available in the QV bitmap viewer:

Slidebar	Move bitmap within the window.
Drag (click-and-hold) with the left mouse button	
+ / **-** / **1**	Zooming in / out / 100%
Click-and-hold with the right mouse button	
Turn the Wheel of your mouse	

Open in your standard bitmap editor	The photo will be opened with the application which is registered in your PC system as the standard bitmap editor for this file type. Identical to a double-click on the corresponding bitmap file in the MS Windows Explorer.
Info	The info encoded in the EXIF section of the JPG file will be listed in a text window.
+	Zoom in
-	Zoom out
1	Zoom 100%
	Zoom to full extent

Show in map during scrolling	Places the map cursor (purple circle) at the position where the photo has been shot. This is a switch. If enabled the position of the map cursor will be updated during scrolling and skip from location to location.
X-Plorer during scrolling	The corresponding point will automatically be referenced during scrolling in the *QV X-Plorer*. Again, this is a switch function.
< >	Skip to the previous or next photo, respectively. If the bitmap editor has been started from the X-Plorer by clicking on a link in the info field, these buttons scroll through the photos of this table only. If the bitmap editor has been started by clicking on the linked symbol, these buttons will scroll through all pictures which have been linked to any marking in the opened map.
Ctrl + **< >**	Skip to the first or last photo, respectively.
Slideshow	Starts a timer-controlled slideshow where all photos will be covered. The start slide show will start with the current photo.
Ctrl + **Slideshow**	The slideshow will start with the first slide.
Settings	Here you can specify the time interval before skipping to the next slide and whether the show should restart from the beginning after the last slide has been presented.

Settings

Settings

Changes the basic *QV* settings.

To modify the basic settings choose **Options - Settings** and select one of the following tabs:

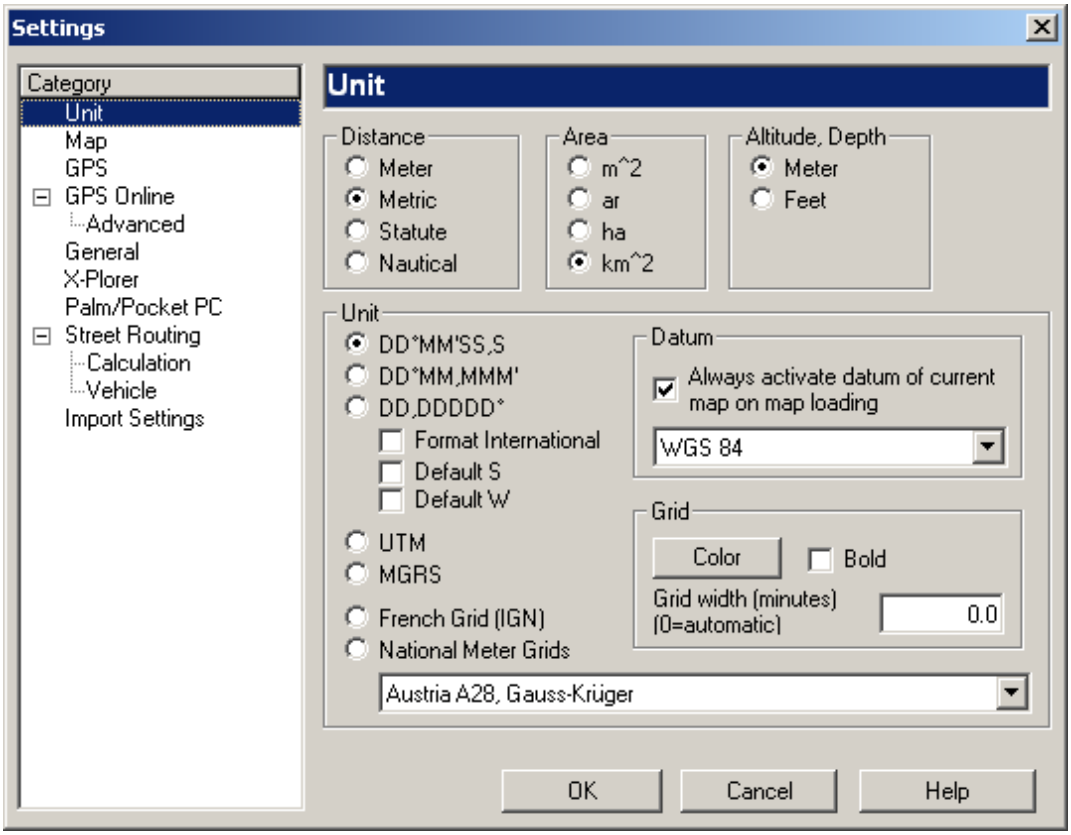
Unit	Units for coordinates, distance, altitude and area
Map	Map parameters, mouse crosshairs
GPS	Type of GPS, interface parameters
GPS Online	Parameters for the GPS online mode
General	Language, track replay
QV X-Plorer	Parameters related to the *X-Plorer*
PDA	Settings for PathAway and Digi-Map
Street Routing	Details see chapter "Street Routing"
Import	Import settings

All setting parameters are saved in the ttqv4a.ini file which is located in the *QV* program directory.

With the QV start-up parameter **ini=myfile.ini** you can activate an alternative *QV* configuration.

Unit Settings

This window can also accessed quickly through the button from the main window and the *X-Plorer*.



Distance Sets the unit for distance, speed and altitude:

Metric: km, km/h, m

Statute: mi, mph, ft

Nautical: nm, kt, ft

Area Unit for the calculation of area sizes in the drawing mode.

Unit Defines the coordinate system for coordinate displays and coordinate entries.

Regardless of the calibration, you can set any other coordinate system.

Please note that many national grids are only valid in clearly defined areas. For example, you cannot enter a coordinates in the Gauss-Kruger system on a map of Africa. The coordinate box shows a red *"0"* in a case like this.

International Format If enabled, degree numbers must be specified with a leading zero, E for eastern longitudes and W for western latitudes, regardless of the language set: N 00° 00' 00.0", E 000° 00' 00.0".

Default S W By setting the defaults for latitude (E/W) and longitude (N/S) you can facilitate manual data entries since the new point will automatically be created in the right hemisphere. Define the appropriate pre-set by enabling/disabling *Default S* and *Default W*, respectively.

Datum Changes the current map datum of the coordinate system. Only meaningful with coordinates which are defined in latitude / longitude and UTM. Please note that the map datum is fixed for all national grids (including the French Grid), so this pull-down menu will not be available when such a grid has been selected.

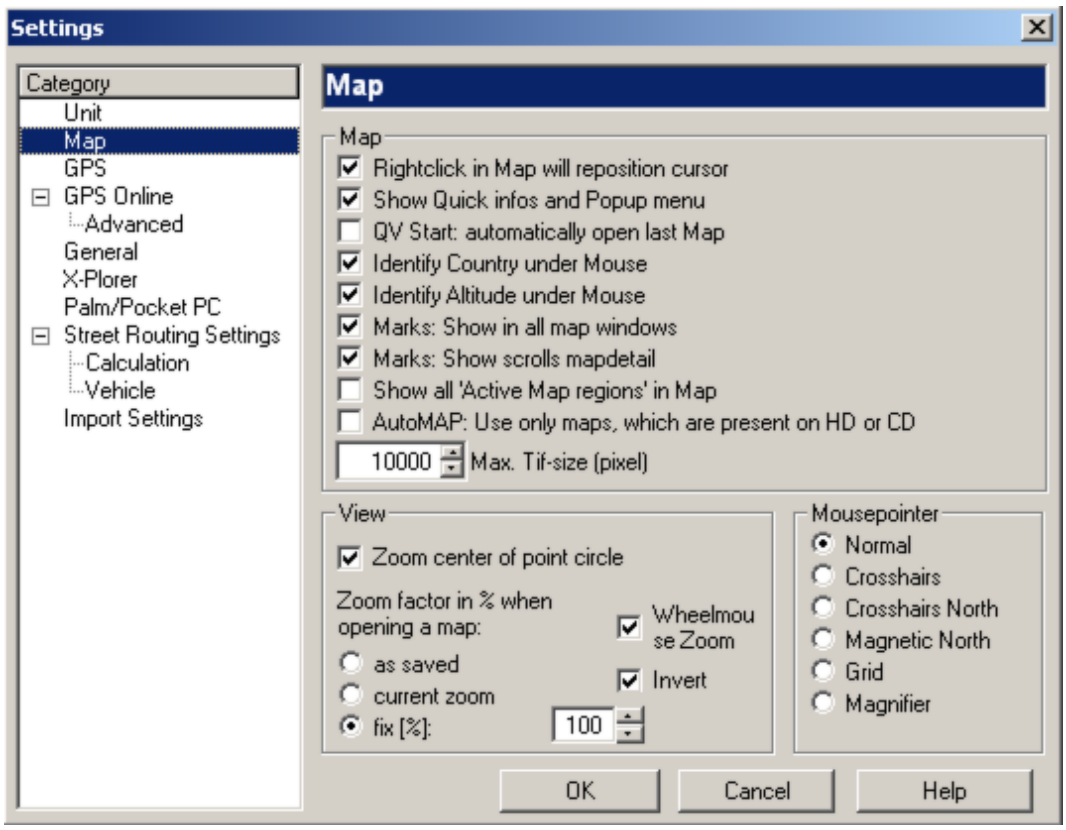
Always activate datum of current map during map loading
If enabled *QV* will automatically switch back to the original map datum (according to the map calibration file) during map loading.

If disabled, *QV* will keep the currently set map datum.

Grid Sets the color and grid size.
Grid color: Defines the color of the grid.
Bold: Sets line width to 2pts and activates bold text font.
Width: Specifies grid size in metres or minutes.
Enter *"0"* for an automatic adjustment.

The automatic adjustment setting will also be used for printing.

Map settings


Settings
Category
Unit
Map
GPS
GPS Online
Advanced
General
X-Plorer
Palm/Pocket PC
Street Routing Settings
Calculation
Vehicle
Import Settings
Map
Map
Rightclick in Map will reposition cursor
Show Quick infos and Popup menu
QV Start: automatically open last Map
Identify Country under Mouse
Identify Altitude under Mouse
Marks: Show in all map windows
Marks: Show scrolls mapdetail
Show all 'Active Map regions' in Map
AutoMAP: Use only maps, which are present on HD or CD
10000
Max. Tif-size (pixel)
View
Zoom center of point circle
Zoom factor in % when opening a map:
as saved
current zoom
fix [%]:
100
Wheelmouse Zoom
Invert
Mousepointer
Normal
Crosshairs
Crosshairs North
Magnetic North
Grid
Magnifier
OK
Cancel
Help

Map

Right click in map will reposition cursor

If enabled, the map cursor will be sent to this position when you open the map pop-up menu with a right-click on the map.

If disabled, the map cursor can only be positioned by left-clicking on the map.

Show Quick-infos and Pop-up menu

If enabled, a yellow infobox will be displayed if the mouse pointer is positioned on a trackpoint in the map.

QV Start: automatically open last map

When QV starts, the map you have used at last will automatically be re-loaded to continue working where you stopped.

Identify Country under Mouse

If enabled, *QV* will determine the country name under the mouse pointer and will specify it in the status line of the main window.

Note that this setting will cause increased hard disk activity as the files *bound.dat* and *bound2.dat* have to accessed permanently.

Identify Altitude under Mouse
If enabled, *QV* will determine the altitude at the mouse pointer from the corresponding DEM and displays it in the status line. Please note that this function requires the installation of DEMs. See chapter *DEMs*.

Marks: Show in all map windows
If enabled, all marks will be displayed in all map windows.

If disabled, marks which are plotted by clicking on the *Show* button, will only be displayed in the active map window.

Marks: Show will reposition map window
If enabled, the map will be repositioned in order to show the whole marking within the map window when marks are plotted by clicking on the *Show* button.

Show all Active Map regions in Map

See chapter *Active Map regions*.

AutoMAP: Use only maps which are present on HD or CD

If enabled, *QV* will automatically check if the corresponding maps are available on the hard disk or CD/DVD drive. If this is not the case it will not be listed by the AutoMap function. If disabled, you will be asked to insert the CD/DVD to the drive when a specific map is not available. For further details please refer to the *AutoMAP* chapter.

Max. TIF size (Pixel)
Specify the maximum size for a complete loading of TIF files. See chapter TIF Maps.

View

Zoom to center of point circle
If enabled, the map will be centered on the map cursor after each zoom command.

If enabled, zooming in and out will always be referred to the center of the active map window.

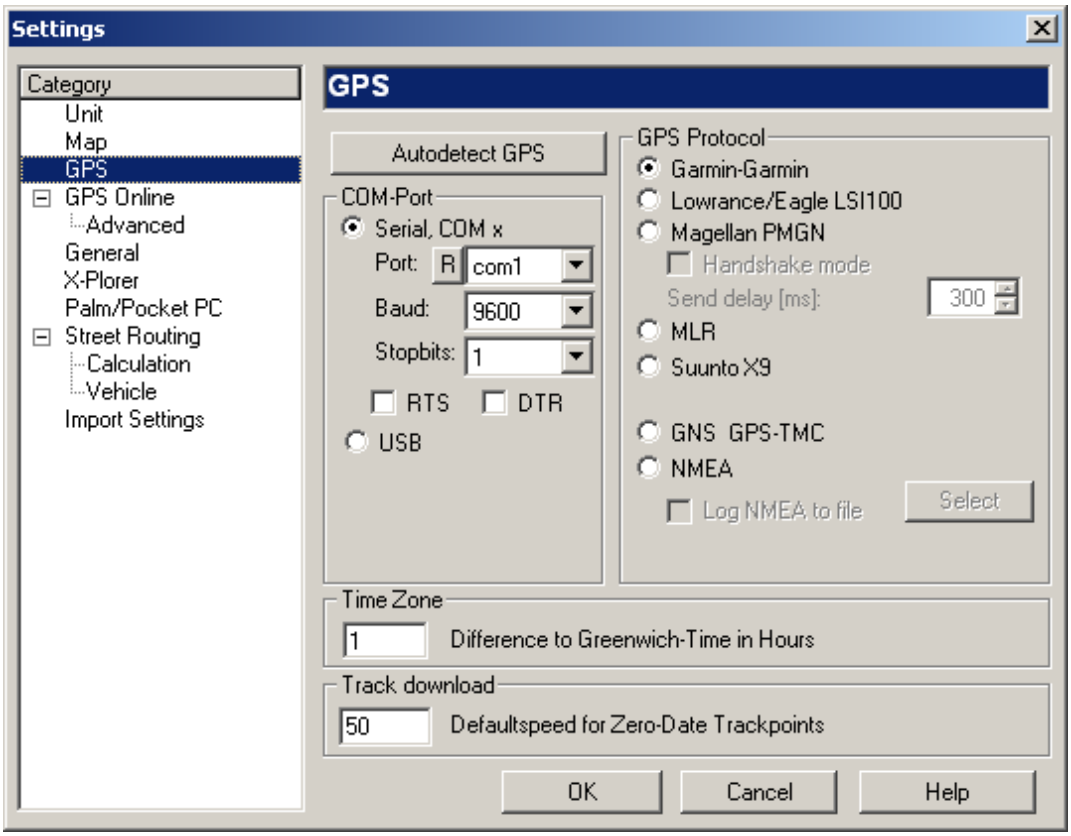
Zoom factor in % when opening a map
Specify here with which zoom level maps should be displayed after opening.

Alternatively you can select **As saved** or choose the **Current Zoom** level.

Mouse pointer Choose the Mouse pointer here. The same options are available as when clicking the mouse pointer icon in the status line of the map window.

See chapter *Mouse pointer*.

GPS settings



Auto Detect GPS *QV* will scan all ports for connected GPS units (please note that your GPS device must be switched on to be identified). This is the simplest method to configure your GPS. All required parameters will be set automatically.

Please note that the *Auto Detect* function will not work with all GPS devices. Only Garmin, Magellan and generic NMEA-units can be found.

COM Port Select the serial interface to which your GPS unit is connected.

R: Will scan all COM ports once again. This is helpful for example after installing an USB-Serial converter.

Available COM ports are indicated in upper case letters (e.g. COMx), ports which are not available in lower case spelling (e.g. comx).

Baud Sets the baud rate at which *QV* communicates with the GPS unit.

This setting must correspond with the setting of your GPS receiver!

Stopbits In general, this should be set to *"1"*. Only a few MLR GPS models use *"2"*.

RTS DTR This setting is for special cases only.

In general, DTR and RTS (which can also be enabled/disabled with the Garmin protocol) should always be disabled.

USB

USB - Garmin only

Choose this setting if your Garmin device is connected through the USB port.

Please note that if you have connected a GPS unit via a serial USB converter, you must not use this setting! In this case you have to select **Serial, COM x** and define the emulated COM port.

You will find the corresponding COM port in your Windows hardware manager or by using the **Auto Detect GPS** function.

Also see GPS.

GPS Protocol

Garmin-Garmin
Sets the Garmin protocol. Used to transfer waypoints, routes, tracks and current position from / to Garmin GPS units.

The Garmin unit must also be set to the Garmin protocol.

Lowrance/Eagle LSI100
Sets the LSI100 protocol. Used to transfer waypoints, routes, tracks and current position from / to Lowrance/Eagle GPS units.

You can also use the GPS online mode with this setting but then the NMEA protocol must be selected in the GPS receiver.

Magellan PMGN
Sets the Magellan PMGN protocol. Used to transfer waypoints, routes, tracks and current position from / to Magellan GPS units.

You can also use the GPS online mode with this setting but then the NMEA protocol must be selected in the GPS receiver.

MLR
Sets the MLR protocol, which is also used by *Valsat* GPS units.
According to the specific model, you will have to specify 1 or 2 stop bits.
e.g.: SP24 / SP24 XC 1 Stopbit
FX312 2 Stopbits

Suunto X9
To exchange gps-data with a Suunto X9-Clock use this switch.

GNS GPS-TMC
This is refers to a special GPS mouse with integrated FM receiver for decoding TMC traffic messages.
See TMC - Traffic messages.

NMEA
Sets the general NMEA protocol that is sent by many GPS units.
This protocol only supports the GPS online mode. Therefore, it is not possible to transfer waypoints, routes and tracks!
QV currently processes the NMEA records $GPRMC, $GPGGA, $GPGLL, $GPGSV and $GPVTG.
You must activate the NMEA protocol also in the GPS unit.

Send delay

For MLR and Magellan GPS units only: When sending waypoints and routes, the delay time in milliseconds between each record can be set. Depending on the serial connection and GPS type a collision of data can be avoided during the download process.

Log NMEA to file

When enabled, the complete data stream received from the GPS device will be logged in a text file. This will also include records that are not processed by *QV*.

Select
Opens a file selection box where you can define a path and file name for the NMEA log file.

Time Zone **Difference to Greenwich Time in Hours**
Internally *QV* will save all times in GMT, e.g. times for positions or trackpoints. GMT represents time zone 0 in this context.

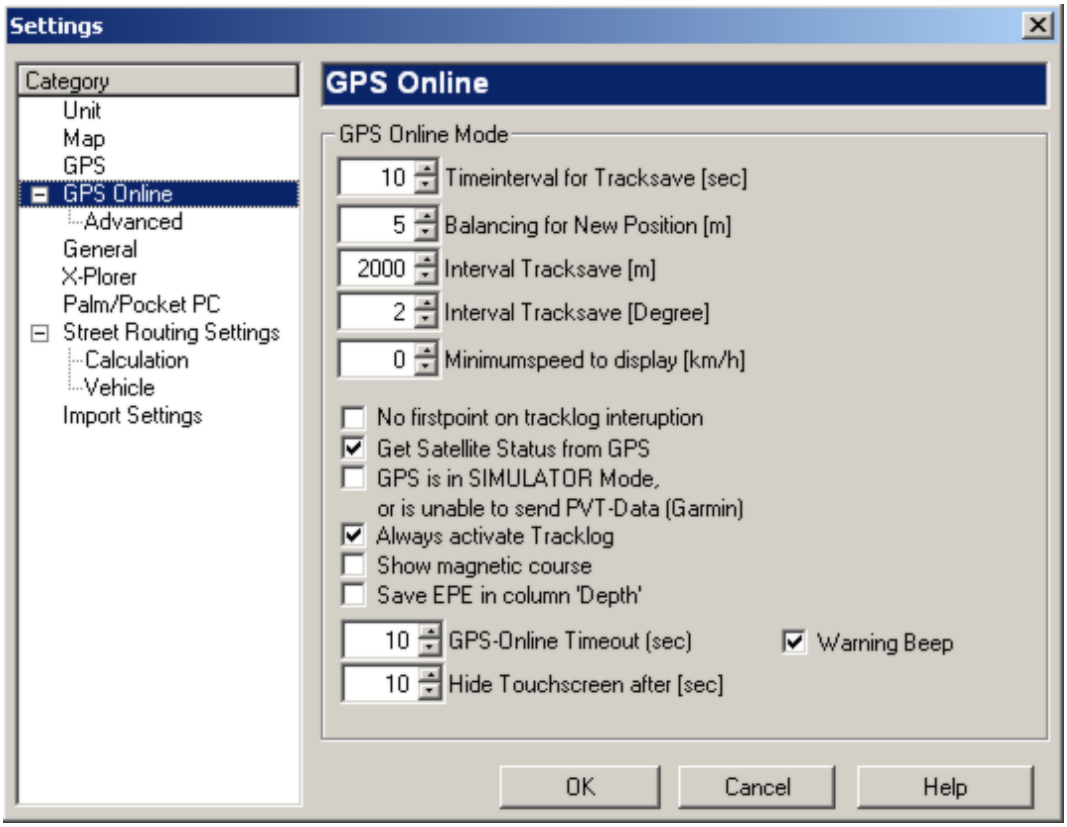
The value which you enter in this field will be added to the stored time before display in order to convert times to your local time zone.

The sign convention is as follows: Positive values refer to east of Greenwich, negative values refer to west of Greenwich.

You can also enter "intermediate time zones", e.g. *8.5* for 8 hours and 30 minutes.

Track Download **Default Speed for Zero-Date Trackpoints**
During track download *QV* will calculate speeds from distances traveled and time intervals between trackpoints. This is not possible if no date/time information is available. In this case the speed that you specify in this field will be taken as default value.

GPS Online settings



GPS Online

Balancing for New Position [m]

Many GPS units do not deliver constant coordinates even if the position is unchanged. Therefore, *QV* features an option to shows a new position only if the position received has changed at least by this user-defined distance.

Interval for saving Track [m] [Degree]

Both of these values have an effect on the number of points that are saved in the track log.

With each new position, *QV* calculates the change in direction and the distance from the last trackpoint. New points will only be stored if the change in direction and distance will exceed the thresholds which you define in these fields.

Minimum Speed for Display

Calculated speeds lower than the value specified in this field will be plotted as *"0"*.

No firstpoint on tracklog interruption

Normally *QV* will classify a trackpoint after an interruption as a *firstpoint*. This will result in creating a new track. By enabling this switch you can suppress the automatic creation of *firstpoints* after a track interruption.

Get Satellite Status from GPS

If the GPS device delivers this information, the status of the satellites will be displayed. With the Garmin protocol, this information is only sent by PVT units.

With NMEA protocol, the status is sent in the $GPGSV sentence.

GPS is in Simulation Mode or is unable to send PVT data (Garmin)

Only applies to Garmin units.
Older Garmin units do not support the PVT protocol, therefore *QV* must explicitly query the current position.
Note that when operating in the simulation mode newer models will not send the simulated position but the actual one!
By enabling this function you can force an explicit query of the position. However, by default this function should be disabled!

Always activate Tracklog

When activated, the Tracklog function will be enabled by default when starting the GPS online mode by clicking the icon or pressing **F4**. This holds also true if the tracklogging switch is set to OFF.

Show magnetic course

When enabled, the course in the GPS online mode will be plotted in relation to magnetic North. This is indicated by the *M* suffix which will follow the course display, e.g. 75°M.

When disabled, the course in the GPS online mode will be plotted in relation to true (geographic) North. This is indicated by the *T* suffix which will follow the course display, e.g. 75°T.

Save EPE in column 'Depth'

If enabled, the EPE value (estimated position error) will be stored in the depth column of the tracklog. This value gives an indication on the accuracy of the location.

GPS Online Timeout [sec]

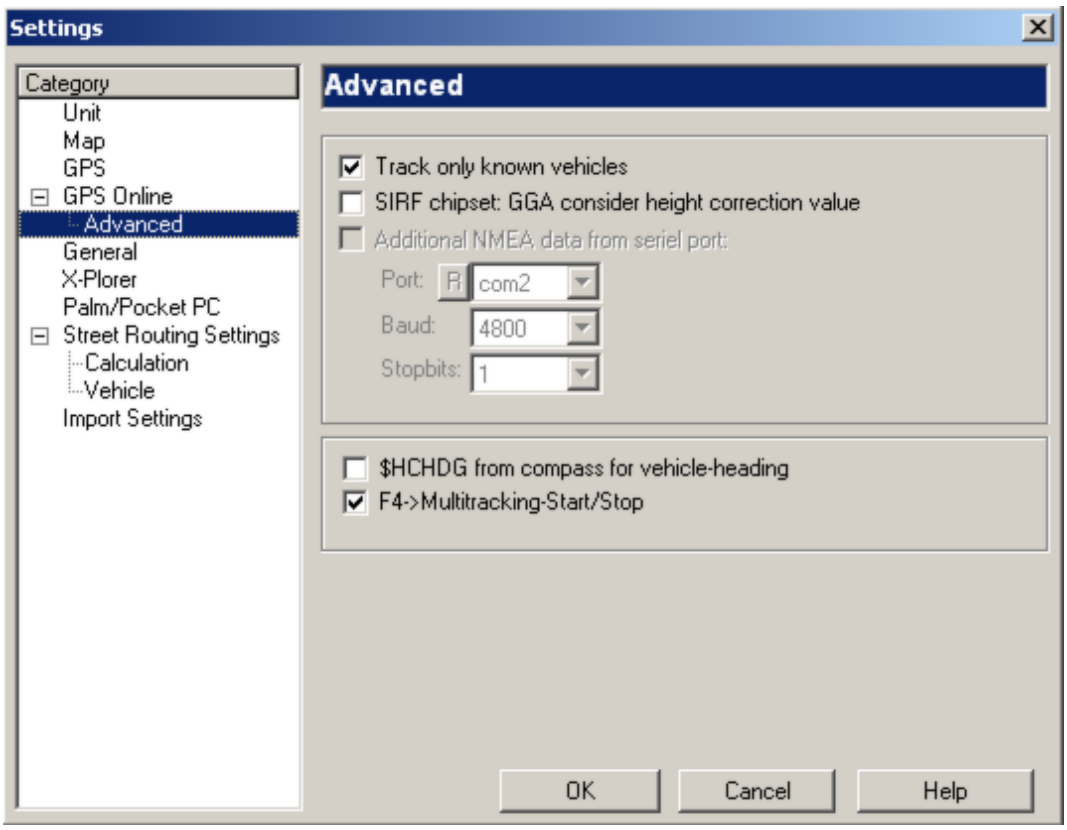
This parameter determines the time interval for detecting a *No GPS* status when position data transfer is interrupted. Most GPS units have an update rate of a position per second, so 10 sec is a suitable value. If you should have a unit with lower update rates, you will have to increase this time interval accordingly.

Warning Beep

If enabled, *QV* will return a warning beep if position data transfer is interrupted.

Hide Touchscreen after [sec]

GPS Online settings - Advanced



Track only known vehicles
Only active in the Multitracking mode. If enabled, all positions from vehicles which are not listed in the active vehicle table will be ignored.

SIRF Chipsatz: Consider GGA height correction value
If enabled, the GGA correction value will be added to the detected GPS altitude.

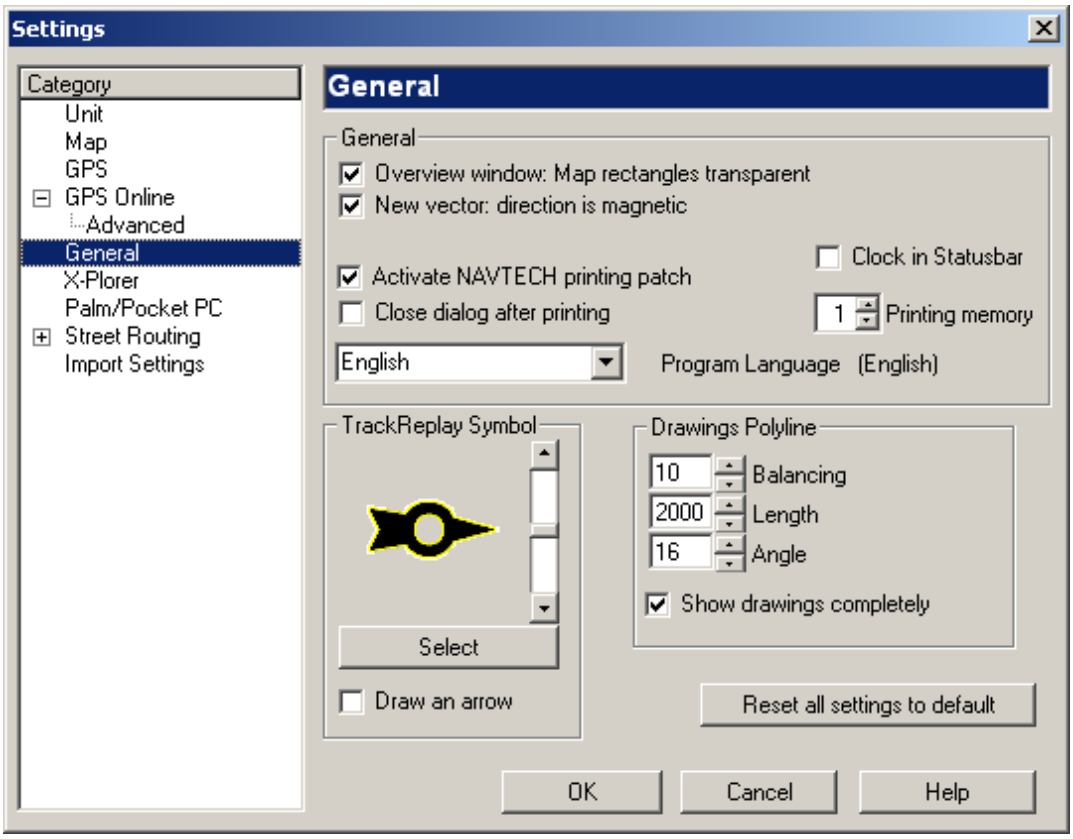
Additional NMEA data from serial port
Use this option if you intend to feed additional NMEA data through a second serial interface, for example from a sonic depth finder. *QV* will mix the NMEA data streams. Only available if NMEA has been selected as GPS protocol.

Please note that position data from another GPS unit cannot be fed to *QV* using this option. If you want to monitor multiple GPS targets, use the *Multitracking* capabilities of *QV Power User* and *QV Professional* (see *Multitracking*).

$HCHDG from compass for vehicle heading
Normally the position indicator will be oriented according to the actual course in relation to North. However, if a magnetic compass is connected which delivers a heading signal as a NMEA $HCHDG sentence, the position indicator can be aligned according to this value (for example in case of a sideway drifting helicopter).

F4 -> Multitracking Start/Stop
Normally the F4 key controls the standard GPS Online mode. If enabled, F4 will control the start/stop command of the *Multitracking* function.

General settings



General

Overview window: Map rectangles transparent

When enabled, the rectangles in the map overview window are plotted transparently. Otherwise, they will be filled in blue.
Also see chapter Map overview window

New vector: direction is magnetic

Setting for new waypoint vectors. If enabled, the specified direction will referred to magnetic North.

Clock in status bar

If enabled, the time will be displayed in the status line to the right of the altitude value.

Program Language

In this pull-down list you can choose the language for the user interface. Please note that you will have to close and restart *QV* so that the new setting will take effect. Some menu options have not been completely translated yet. These will automatically be labeled in English.

Printing

Activate NAVTEQ printing patch

If you should encounter problems when printing a *Navteq* map, please enable this function to activate an alternative printing option.

Printing memory

When printing large maps in high resolution memory restrictions may occur. With this entry you can control the memory allocation at the cost of increased time needed for the printout. The lower the specified value, the lower the memory requirement for the printing job.

Close dialog after printing

By default, the *Print Map* dialog box will close after the print job has been finished. If you want to print multiple pages you can prevent the dialog box from being closed automatically if you disable this function.

Drawings Polyline

If polylines are drawn using the freehand mode, *QV* will automatically perform a reduction of points. Here you can adjust the corresponding parameters. The function works identical to the *Reduce trackpoint function* (see there).

Show drawings completely
If disabled, only the drawing objects will be displayed which are marked in the *X-Plorer*. Otherwise the complete drawing will be plotted.

Track Replay

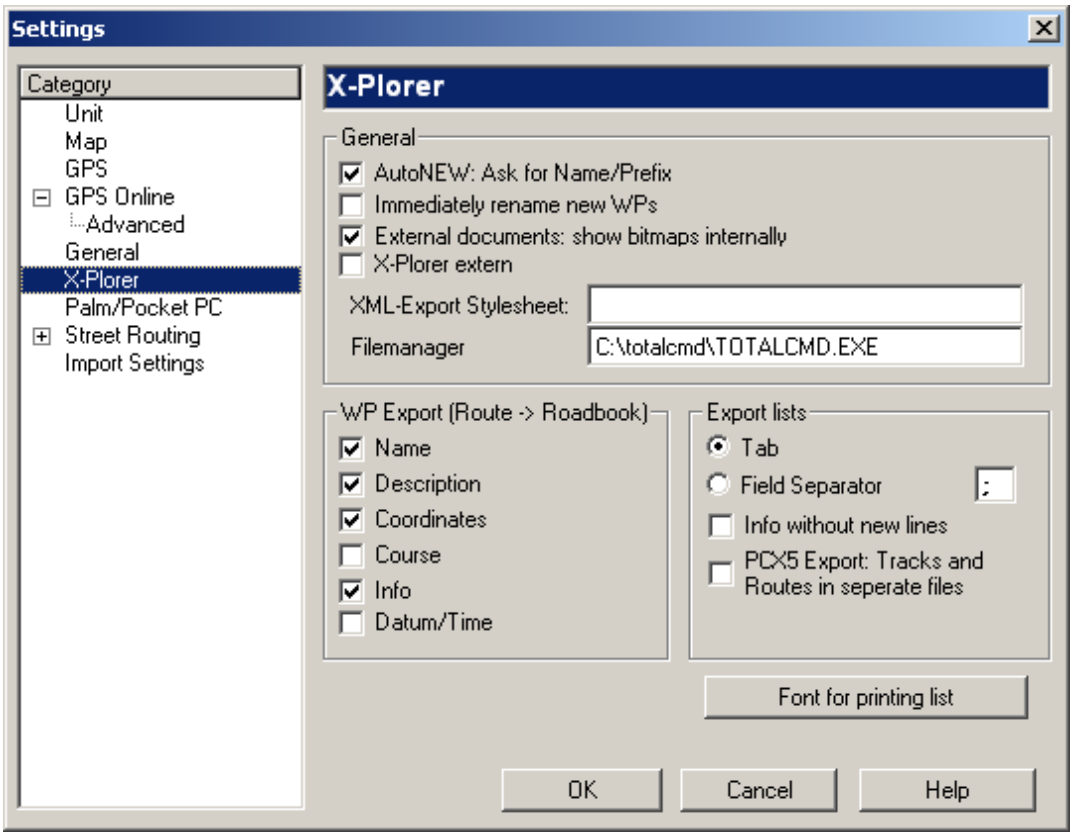
Select
Using this button you can select another symbol for the Track Replay function. The chosen symbol will be shown as a preview and the symbol size can be adjusted using the vertical slide bar.

Draw an arrow: resets the symbol to the standard arrow.

Reset all settings to default

This button will reset all parameters to default settings, close QV and restart with the next program execution as *"newly installed"*.

QV X-Plorer settings



General settings **AutoNEW: Ask for Name/Prefix**

If enabled, you will be asked for a name and corresponding prefix with every new route or track you create with the *AutoNEW* function (please note that the name and prefix will be asked in separate dialog boxes).
If disabled, names and prefixes will be set by default.
See chapter AutoNEW - Creating markings .

Immediately rename new WPs

If enabled, a waypoint name can be changed immediately in the map window after being created with the *AutoNEW* function. Just enter the new name and press the **Enter** key or click with the mouse anywhere in the map window. Alternatively, you can press **Esc** to cancel the renaming function.

External documents: show bitmaps internally

If enabled, linked bitmaps will be opened in an own QV window. If disabled, the standard Windows bitmap viewer will be started to display the linked bitmap. See chapter *Linking external documents*.

X-Plorer extern
If enabled, the *X-Plorer* window can be arranged as a separate window on your desktop (for example to move it to a second monitor). If disabled, the *X-Plorer* window can only be placed within the *QV* main window.

XML Export Stylesheet
When creating XML files using the *X-Plorer* **Export XML** function you can optionally define a XLS file which will be used as a header of the generated XML file. The file name of this XLS file must be specified here.

Filemanager
In the *X-Plorer* pop-up menus for databases, directories and maps you will find the option **Filemanager** to open the selected object with a filemanager. The file manager application which you enter in this field will be used. If you leave the field empty, the *MS Explorer* will be used.

WP-Export Route-Roadbook Here you can define which information shall be written into the third column of a Roadbook table during conversion of a route to a Roadbook file. You can optionally enable **Name**, **Description**, **Coordinates**, **Course**, **Info** and **Date/Time**.

Export List Specify the delimiter here which should be used for the commands *Print List to File* and *Copy list to Windows Clipboard*.

Info without new lines Exports info field without line break, i.e. one data set per line.

PCX5 Export: Tracks and Routes in separate files If disabled, all data sets marked will be exported to one single file.

If enabled, separate files will be generated for each route and track. The file names will be created from the file name which you specified, extended by the route or waypoint name.

Font for printing list Using this button you can specify a font type and size for the printing of lists in the *QV X-Plorer*.

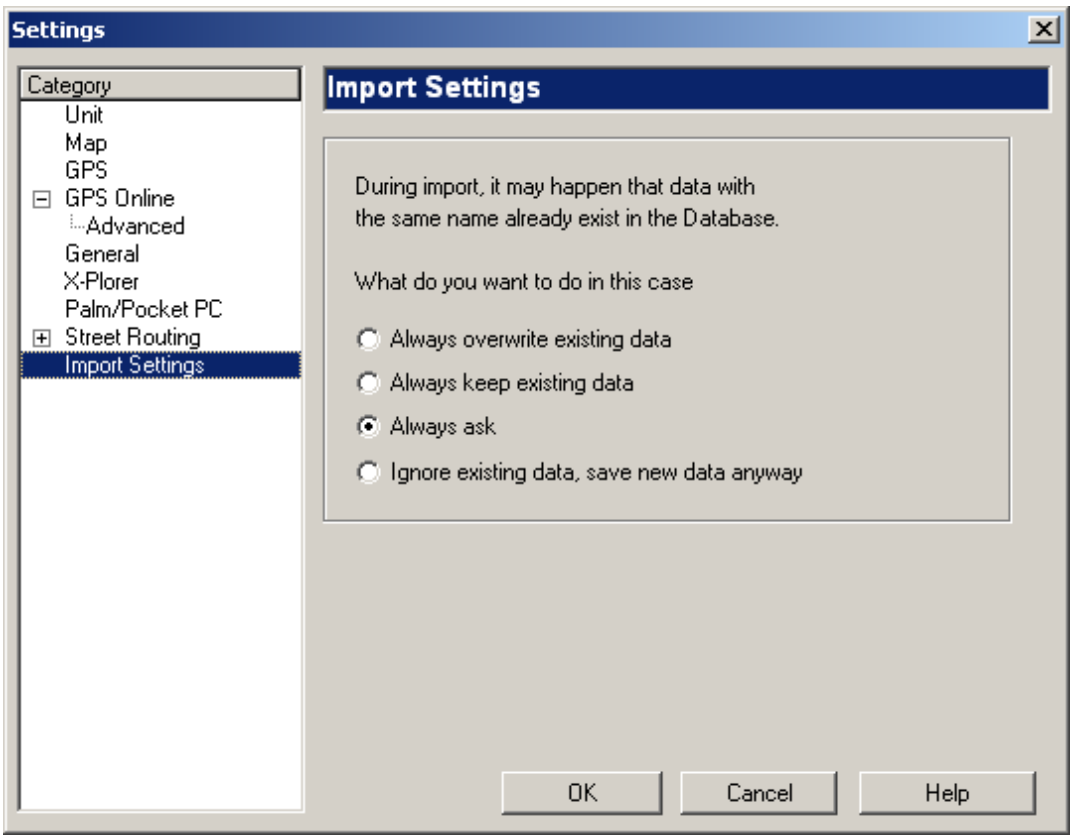
PDA settings

All related options are described in detail in the Pathaway chapter (see there).

Street Routing settings

All related options are described in detail in the Street-Routing chapter (see there).

Import settings



This function controls how data is saved if a data record with the same name already exists. This can happen when importing data or when downloading GPS data. In this case *QV* can either:
i) keep the existing data and disregard the new data record
ii) overwrite the existing data with the new data record
iii) rename the new data record.

Select **Import settings** from the pull down menu in the main window and define a global setting:

- Always overwrite existing data
- Always keep existing data
- Always ask
- Ignore existing data, save new data anyway

If you choose **Always ask (**which is also the default *QV* setting), the following window will pop-up each time a naming conflict occurs:

- Overwrite Data record
- Disregard data record
- Rename data record, specify a new name in the entry field.

With the first two options you can also authorize *QV* to perform this function automatically if a name conflict occurs during import. If this is what you want, simply tick-mark **Do not ask me again** in the dialog box.

Export and import of data

QV data transfer between PC platforms

Transferring data between different *QV* PC Platforms

This is so easy that QV even does not need a specific function for this task!

Just copy the relevant QU4 database to any transfer medium (CD, DVD, Memory stick, mail-attachment, etc.) and save it at the other PC into the *QV Data* directory.

You will find the relevant database if you select the directory in the *QV X-Plorer* or from the map window by choosing **X-Plorer** from the pop-up menu after a right-click with your mouse at any spot of the map. On the list window on the right of the *X-Plorer* you will see all elements of this database listed with file size and the path.

You can also choose **Open with Filemanager** from the pop-up menu which you can access with a right-click of your mouse on the database name.

At the PC to which the data have been transferred, the database will automatically appear in the directory tree of the *X-Plorer* window. The data will be transferred completely; however, if the database is referring to linked tables, you might have to assign the correct paths manually if this PC uses another directory structure.

You will find further information under **Copying of Maps** in the chapter X-Plorer Window.

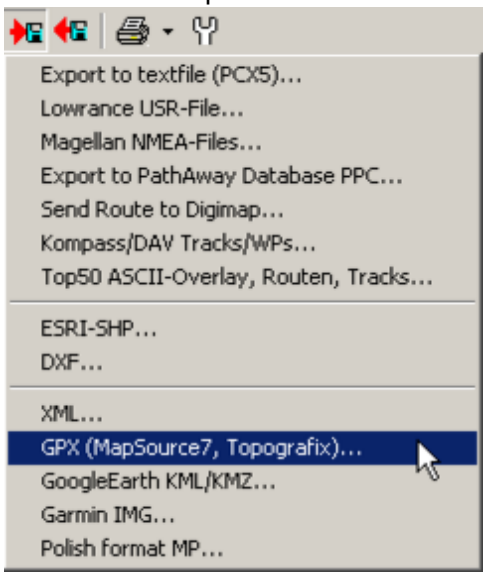
If you are going to exchange data with another PC frequently (for example between your stationary PC and your laptop) we recommend to use separate databases for your maps and GPS data. This will save you from the need of correcting your map paths frequently because map tables will normally not change while waypoints, routes and track tables do change frequently. If you follow this recommendation you will only have to copy the databases containing your GPS data.

Export

Export for further processing in other programs

There are various options to export data from the *QV X-Plorer*.
The procedure to do this is always the same:

- Mark the data that you want to export in the *X-Plorer*.
  These can be particular tracks, routes, waypoints, tables or an entire database.
- Click on the Export icon and choose the desired format:



- Enter the path and file name for the exported file.

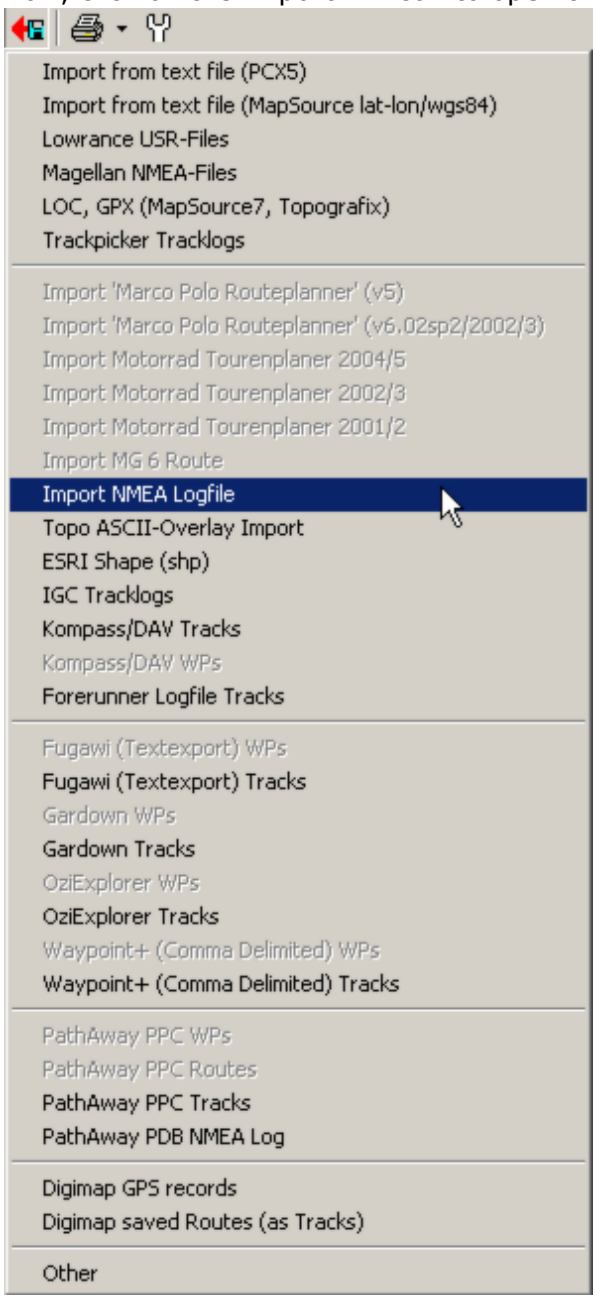
An alternative way is to create lists with the printing function of the *QV X-Plorer*. See chapter X-Plorer Window.

Import

Data Import

QV can import a wide spectrum of different file types directly. However you must know from which program or Hardware device the files have been created and select the corresponding menu option:

- First of all, select the table in QV *X-Plorer* in which you wish to save the data to be imported.
- Now, click on the Import icon to open the **Import** Pop-up menu:



- Depending on the table selected, you can only select the functions that are suitable for this type of table. For example, if you want to import routes, you must have selected a route table.
- Select the import file from the file selection box and click on **OK**. You can also select multiple files at a time and import them in one batch!

Many import files file can contain waypoints, routes and tracks. By selecting a specific table, only the data that corresponds to the table type is imported. To import all the data from a file, you must first select a directory in the X-Plorer. During import, a new database is created which will contain all imported data.

Importing data with import filters

This function is used to import waypoints and tracks from text files which originate from other programs. It is not restricted to a specific format but is a universal tool that can able adapted to different format characteristics which can also be saved as import filters.

The source files must meet several conditions:

- They must be ASCII files, binary formats cannot be processed.
- The data must be structured in lines, i.e. one waypoint or trackpoint per line.
- The lines must have a uniform structure.
- Routes cannot be processed.
- All trackpoints in a file are imported as one track. Gaps in a track can be taken into account with the option **First Point**.
- Coordinates must be provided either in degree (dd.ddddd), degree-minutes (dd mm.mmm) or degree-minutes-seconds (dd mm ss.ss), delimited by a coma or point.

Important: Degree, minute and second must all be separated by a "delimiter sign". Any character, except for numbers from 0-9, point and coma, is accepted as delimiter.

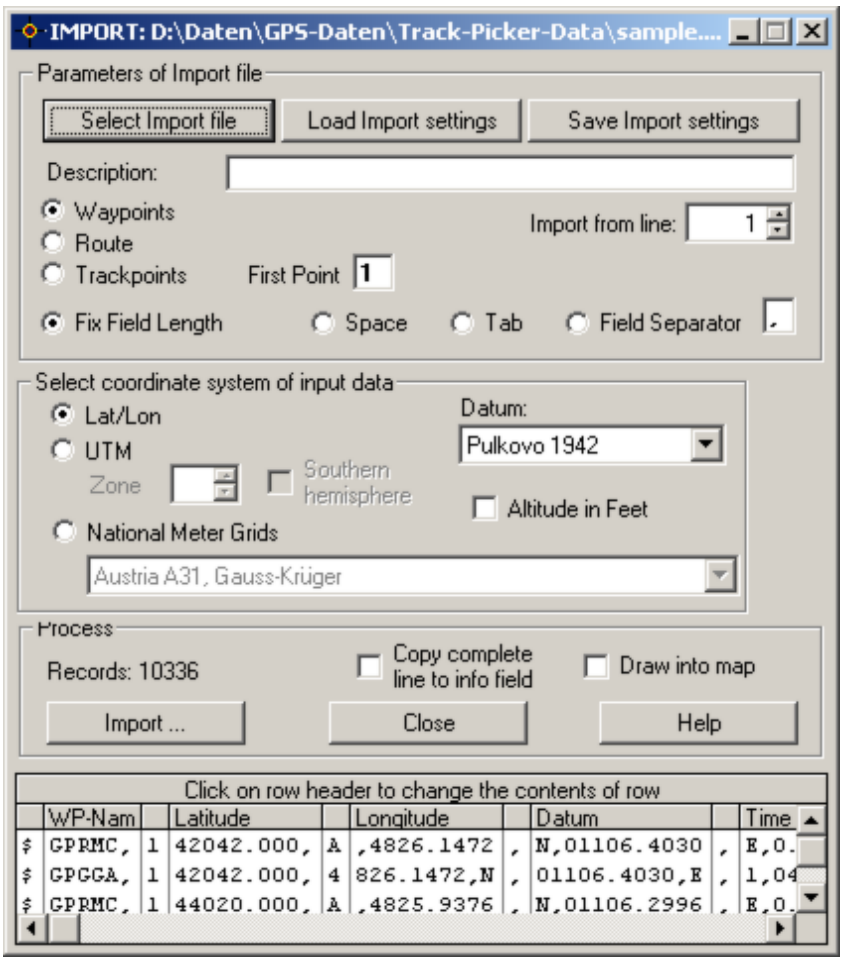
North and South have to be indicated either by + and - or N and S.

East and West are indicated either by + and - or O/E or W

Example: N 50 30 20 is interpreted as 50 degrees 30 minutes 20 seconds; the same holds true for 50°30'20" while N 50 30.20 stands for 50 degrees 30,33333 minutes and N 503020 is invalid since there are no separating signs.

Procedure:

- As always, first select the table in *X-Plorer* in which you want the imported data to be saved.
- Open the Import pop-up menu and select **Other** in order to define a format yourself.
- Then, in the following file selection box, select the text file to be imported.
- You will now see the data in the table of the import window that corresponds to the selected or current format.
- If the previewed format is correct, click on **Import** and the data will either be drawn on the map and / or imported directly into the database.
- If the previewed format is not suitable, you must change the parameters until you see the data arranged according to your requirements and click **Import**.



Characteristics of the file import

Select import file
Save Import settings
Load Import settings

Choose an import file to be opened.

If you have once set all parameters for a specific file type, you can save these settings in a QIF file. Thus, a quick access is possible when you have to import another file of this type later on.

A couple of predefined import filters are delivered with *QV* for the following applications: Fugawi (Textfile), Waypoint+, PathAway CSV, Gardown and OziExplorer, which will work for waypoints and tracks. You will find these QIF file on the root of the *QV* directory.

Description

Here you can enter a user-specified comment in order to add specific information on the content of this file.

Waypoints, Route, Trackpoints

Choose here whether the file to be imported contains waypoints, routes or trackpoints. *QV* can only handle one type at a time.

First Point

A "first point" is the starting point of a trackline. So, this can also be interpreted a the first point after a gap in a trackline. For example, OziExplorer will label such a point with a "1" in a separate column. A "0" indicates in this case, that this trackpoint is connected with the last one by a line and should not be interpreted as a new starting point.

In this field you can specify the character which will label new starting point within a track file.

Import from line

If your file contains a header line or if you would like to exclude some data set at the beginning of the file, you can specify in this field in which line the import should start.

Fixed field length	Use this setting if your import file is of the type "fixed data length" which means that data of the same type are always located in the same position of the line, such as waypoints always at position 4-9 and longitude coordinates always at position 22-31 and so on. In this case you must adapt the column width by adjusting the separation lines between the columns with the mouse to the adequate position (left mouse click with press&hold).
Field separator	In this case the data in the file are delimited with a separation sign. You can choose *Space*, or *Tab* or specify any character. Comas and semicolons are used frequently. After selecting the correct delimiter, *QV* will assign the data to the adequate culums automatically and you will not have to adjust the column width.

Coordinate conversion

Under *Select coordinate system for input data* you have to specify in which coordinate system the data to be imported are defined:

Lat/Lon	The values are specified in Degrees, degrees / minutes or in degrees / minutes / seconds
UTM	The values are given in the metric UTM system. In this case you will have to additionally define the UTM zone and the hemisphere.
Grid	Choose from a list of various metric grid systems.
Datum	If you have specified a Lat/Lon or UTM coordinate system you will have to specify the map datum in this field.
Altitude in Feet	Enable this software switch if the altitude values are specified in feet. For metric altitude values this switch must be disabled

Under Processing you select one of various available commands:

Import	Start the import procedure
Close	Close the dialog box.
Copy complete lines into field	If you enable this switch the entire line will be copied to the info field.
Draw into map	When enabling this switch, the data will directly be plotted in the map after import.

Table

Here, you will see the data arranged in lines and columns according to the parameters set. Each column has a column header which labels the content of the column. Left click on the header of a column to change the column label. To be more precise, by this you can change the way *QV* will interpret this column later during importing. If you select "X" from the pop-up menu, the column will be ignored during import.

If you click on the area between two column headers and keep the mouse button down, you can change the width of the column. This is important for data with fixed field lengths because *QV* must structure the data accordingly during import and assign them to them to the correct column header. You scan arrange his by setting the column width correctly and by naming the column header correspondingly.

The following data can be imported:

Waypoint name

Latitude

Longitude

Latitude/Longitude (if the coordinates are placed in a unique field without delimiter)

Waypoint description
Date (date only)
Time (time only)
Date / Time (if date and time is in one column)
First point (for tracks only)
Information
Altitude

Please note that comments and empty lines within the text file will be filtered and ignored by *QV*.

So that a line can be successfully imported, the converted values for latitude and longitude must differ from 0. With waypoints, the value of the *Waypoint name* column must not be empty.

Updates and support

Updates and support

Updates

You will get free bugfix-Updates through our support forum at http://forum.ttqv.com or on request also per mail if you cover the mailing costs.

You can also check for new updates using the function ***? - Check TTQV.DE for a new Update*** from the QV main menu. If a new Update is available, an info pop-up box will open from which you can directly download the file. After finishing the download, close QV and run the downloaded *qv4upd.exe* file to install the new version. All data and QV settings will remain!

Support

Support concerning product spectrum, Updates, related prices, delivery and distribution of *QV* will be provided by your *QV* dealer.

All technical questions concerning installation and operation of *QV* should be addressed through our support forum at http://forum.ttqv.com. There you can contact the specialists concerning technical support, programming, distribution and marketing. The forum is opened 7 days a week day and night.

Through this forum also *QV* users interact and exchange their experience. so the forum is a invaluable source of knowledge around *QV*. Place a new question or search for contributions to your subject of interest. Usually you will get a competent answer very soon.

A list of frequently asked questions and answers is available at this link:
http://forum.ttqv.com/viewforum.php?f=20

Homepage

The address of our home page is http://www.ttqv.com. There you will find details on our products and you can also download QV updates. A color scan service for paper maps (up to the size DIN A0) is also available there.

QV can only further evolve if we know your requirements and suggestions. We are always grateful for any hint concerning errors or for ideas for new functions. QV has emerged to such an acknowledged navigation software only through the input of our customers and we would like to thank you for your contributions!

You can reach the *QV* author by e-mail at service@ttqv.com.

Please include the version-number of QV at all inquiries. You find this under ? - About... or just in the Titlebar of the main-window:

Appendix

Keyboard commands

You can access the most important functions also through the keyboard. This may be helpful especiall when operation QV during driving as placing a mouse will be difficult specially during offroad driving. However, always consider that driving safety must not be restricted!

If you have the **AutoMAP** mode active, *QV* will automatically search the neigbouring map when you reach the boundaries of the map window with the arrow keys. You will be asked to confirm the opening of the map.

Remark: The search for neigbouring maps is related to you actual mouse position. When maps overlap and your mouse is positioned vertically or horizontally outside the extent of a neighbouring map, *QV* will consider this map as not suitable.

F1	Help for the current window
Shift-F1	This page, i. e. overview on the keyboard commands
F2	Brings the map window to the front
F3	Brings the *X-Plorer* window to the front
Shift-F3	In the *X-plorer*: edits the selected element in the tree or list window
F4	Starts/stops the GPS- Online mode
F5	Enables/disables the tracklogging in the GPS- Online mode
F6	Stores the actual position as a waypoint in the online mode
F7	Switches between normal and maximum window size
F8	Overlays or masks a north arrow
F9	Overlays or masks a scale
F10	Opens another map with the same scale for the current position
F11	Overlays the Cyrillic alphabet
Shift-F12	Overlays a window with specific information on the map
Ctrl-L	Displays the key (legend) to the map if available
Ctrl-D	Scrolls through all modes of the night screen
Ctrl-P	Looks for a point through coordinate entries in all maps
Ctrl-N	Starts AutoNEW mode
Ctrl-E	Starts AutoEDIT mode
Ctrl-H	Calculates route from here to the HOME point
ESC	Closes the current window
Ctrl-M	Switches AutoMAP to the next mode
UP ARROW	Scrolls the map within the window upwards
DOWN ARROW	Scrolls the map within the window upwards
LEFT ARROW	Scrolls the map within the window to the left
RIGHT ARROW	Scrolls the map within the window to the right
+ or I	Zooms into the map
- or O	Zooms out from the map
1	Restores zoom to 100%

2	Quick zoom-in
3	Quick zoom-out
4	Zooms to the whole map extent
5	Centers on the cursor position
Ctrl +	Opens the map for the current position with a larger scale
Ctrl -	Opens the map for the current position with a smaller scale
Alt +	Opens the map for the current position with the largest scale
Alt -	Opens the map for the current position with the smallest scale
ESC	Cancels a window selection (zoom window, selecting print extent, etc.)
C	Online mode only: Moves the map within the window so that the current position is exactly in the center of the screen
G	Online mode only: Doubles the size of the position marker. A second push on the button will restore the original size.
O	Starts the "search with surrounding" function in the database
R	Redraws the map window (e.g. if artefacts affect the actual graph)

Codes in the geographic names database

Feature class

A	Administrative boundary feature
H	Hydrographic feature
L	Area feature
P	Population feature
R	Road / Railroad feature
S	Spot feature
T	Elevation feature
U	Undersea feature
V	Vegetation feature

Code	Class	Description
ADM1	A	FIRST-ORDER ADMINISTRATIVE DIVISION
ADM2	A	SECOND-ORDER ADMINISTRATIVE DIVISION
ADM3	A	THIRD-ORDER ADMINISTRATIVE DIVISION
ADM4	A	FOURTH-ORDER ADMINISTRATIVE DIVISION
ADMD	A	ADMINISTRATIVE DIVISION
ADMF	S	ADMINISTRATIVE FACILITY
AGRC	L	AGRICULTURAL COLONY
AGRF	S	AGRICULTURAL FACILITY
AIRB	S	AIRBASE
AIRF	S	AIRFIELD
AIRH	S	HELIPORT
AIRP	S	AIRPORT
AIRQ	S	ABANDONED AIRFIELD
AIRS	H	SEAPLANE LANDING AREA
AMTH	S	AMPHITHEATER
ANCH	H	ANCHORAGE
ANS	S	ANCIENT SITE
APNU	U	APRON
ARCH	S	ARCH
ARCU	U	ARCH
AREA	L	AREA
ARRU	U	ARRUGADO
ASPH	T	ASPHALT LAKE
ASTR	S	ASTRONOMICAL STATION
ASYL	S	ASYLUM
ATHF	S	ATHLETIC FIELD
ATOL	T	ATOLL(S)
BAR	T	BAR
BAY	H	BAY
BAYS	H	BAYS
BCH	T	BEACH
BCHS	T	BEACHES
BCN	S	BEACON
BDG	S	BRIDGE
BDGQ	S	RUINED BRIDGE
BDLD	T	BADLANDS
BDLU	U	BORDERLAND
BGHT	H	BIGHT(S)
BKSU	U	BANKS
BLDG	S	BUILDING(S)
BLDR	T	BOULDER FIELD
BLHL	T	BLOWHOLE(S)
BLOW	T	BLOWOUT(S)
BNCH	T	BENCH
BNCU	U	BENCH
BNK	H	BANK(S)
BNKR	H	STREAM BANK
BNKU	U	BANK
BNKX	H	SECTION OF BANK
BOG	H	BOG(S)
BP	S	BOUNDARY MARKER
BRKS	S	BARRACKS
BRKW	S	BREAKWATER
BSND	L	DRAINAGE BASIN
BSNP	L	PETROLEUM BASIN
BSNU	U	BASIN

BSTN	S	BALING STATION
BTL	L	BATTLEFIELD
BTYD	S	BOATYARD
BUR	S	BURIAL CAVE(S)
BUSH	V	BUSH(ES)
BUTE	T	BUTTE(S)
CAPE	T	CAPE
CAPG	H	ICECAP
CARN	S	CAIRN
CAVE	S	CAVE(S)
CDAU	U	CORDILLERA
CFT	T	CLEFT(S)
CH	S	CHURCH
CHN	H	CHANNEL
CHNL	H	LAKE CHANNEL(S)
CHNM	H	MARINE CHANNEL
CHNN	H	NAVIGATION CHANNEL
CLDA	T	CALDERA
CLF	T	CLIFF(S)
CLG	L	CLEARING
CMN	L	COMMON
CMP	S	CAMP(S)
CMPL	S	LOGGING CAMP
CMPLA	S	LABOR CAMP
CMPMN	S	MINING CAMP
CMPO	S	OIL CAMP
CMPQ	S	ABANDONED CAMP
CMPRF	S	REFUGEE CAMP
CMTY	S	CEMETERY
CNFL	H	CONFLUENCE
CNL	H	CANAL
CNLA	H	AQUEDUCT
CNLB	H	CANAL BEND
CNLD	H	DRAINAGE CANAL
CNLI	H	IRRIGATION CANAL
CNLN	H	NAVIGATION CANAL(S)
CNLQ	H	ABANDONED CANAL
CNLSB	H	UNDERGROUND IRRIGATION CANAL(S)
CNLX	H	SECTION OF CANAL
CNS	L	CONCESSION AREA
CNSU	U	CANYONS
CNYN	T	CANYON
CNYU	U	CANYON
COLF	L	COALFIELD
COMC	S	COMMUNICATION CENTER
CONE	T	CONE(S)
COVE	H	COVE(S)
CRDR	T	CORRIDOR
CRKT	H	TIDAL CREEK(S)
CRNT	H	CURRENT
CRQ	T	CIRQUE
CRQS	T	CIRQUES
CRRL	S	CORRAL(S)
CRSU	U	CONTINENTAL RISE
CRTR	T	CRATER(S)
CSNO	S	CASINO
CST	L	COAST
CSTL	S	CASTLE
CSTM	S	CUSTOMS HOUSE
CSWY	R	CAUSEWAY
CSWYQ	R	FORMER CAUSEWAY
CTHSE	S	COURTHOUSE
CTRA	S	ATOMIC CENTER
CTRB	L	BUSINESS CENTER
CTRCM	S	COMMUNITY CENTER
CTRF	S	FACILITY CENTER
CTRM	S	MEDICAL CENTER
CTRR	S	RELIGIOUS CENTER
CTRS	S	SPACE CENTER
CUET	T	CUESTA(S)
CULT	V	CULTIVATED AREA

CUTF	H	CUTOFF
CVNT	S	CONVENT
DAM	S	DAM
DAMQ	S	RUINED DAM
DAMSB	S	SUB-SURFACE DAM
DARY	S	DAIRY
DCK	H	DOCK(S)
DCKB	H	DOCKING BASIN
DCKD	S	DRY DOCK
DCKY	S	DOCKYARD
DEPU	U	DEEP
DEVH	L	HOUSING DEVELOPMENT
DIKE	S	DIKE
DLTA	T	DELTA
DOMG	H	ICECAP DOME
DPOF	S	FUEL DEPOT
DPR	T	DEPRESSION(S)
DPRG	H	ICECAP DEPRESSION
DSRT	T	DESERT
DTCH	H	DITCH
DTCHD	H	DRAINAGE DITCH
DTCHI	H	IRRIGATION DITCH
DTCHM	H	DITCH MOUTH(S)
DUNE	T	DUNE(S)
DVD	T	DIVIDE
EDGU	U	SHELF EDGE
ERG	T	SANDY DESERT
ESCU	U	ESCARPMENT (OR SCARP)
EST	S	ESTATE(S)
ESTB	S	BANANA PLANTATION
ESTC	S	COTTON PLANTATION
ESTO	S	OIL PALM PLANTATION
ESTR	S	RUBBER PLANTATION
ESTSG	S	SUGAR PLANTATION
ESTSL	S	SISAL PLANTATION
ESTT	S	TEA PLANTATION
ESTX	S	SECTION OF ESTATE
ESTY	H	ESTUARY
FAN	T	FAN(S)
FANU	U	FAN
FCL	S	FACILITY
FISH	H	FISHING AREA
FJD	H	FJORD
FJDS	H	FJORDS
FLD	L	FIELD(S)
FLDI	L	IRRIGATED FIELD(S)
FLLS	H	WATERFALL(S)
FLLSX	H	SECTION OF WATERFALL(S)
FLTM	H	MUD FLAT(S)
FLTT	H	TIDAL FLAT(S)
FLTU	U	FLAT
FNDY	S	FOUNDRY
FORD	T	FORD
FRKU	U	FORK
FRM	S	FARM
FRMQ	S	ABANDONED FARM
FRMS	S	FARMS
FRMT	S	FARMSTEAD
FRST	V	FOREST(S)
FRSTF	V	FOSSILIZED FOREST
FRSU	U	FORKS
FRZU	U	FRACTURE ZONE
FSR	T	FISSURE
FT	S	FORT
FURU	U	FURROW
FY	S	FERRY
GAP	T	GAP
GAPU	U	GAP
GASF	L	GASFIELD
GATE	S	GATE
GDN	S	GARDEN(S)

GHSE	S	GUEST HOUSE
GLCR	H	GLACIER(S)
GLYU	U	GULLY
GOSP	S	GAS-OIL SEPARATOR PLANT
GRAZ	L	GRAZING AREA
GRGE	T	GORGE(S)
GRSLD	V	GRASSLAND
GRVC	V	COCONUT GROVE
GRVE	S	GRAVE
GRVO	V	OLIVE GROVE
GRVP	V	PALM GROVE
GRVPN	V	PINE GROVE
GULF	H	GULF
GVL	L	GRAVEL AREA
GYSR	H	GEYSER
HBR	H	HARBOR(S)
HBRX	H	SECTION OF HARBOR
HDLD	T	HEADLAND
HERM	S	HERMITAGE
HLL	T	HILL
HLLS	T	HILLS
HLLU	U	HILL
HLSU	U	HILLS
HLT	S	HALTING PLACE
HMCK	T	HAMMOCK(S)
HMDA	T	ROCK DESERT
HOLU	U	HOLE
HSE	S	HOUSE(S)
HSEC	S	COUNTRY HOUSE
HSP	S	HOSPITAL
HSPC	S	CLINIC
HSPD	S	DISPENSARY
HSPL	S	LEPROSARIUM
HSTS	S	HISTORICAL SITE
HTH	V	HEATH
HTL	S	HOTEL
HUT	S	HUT
HUTS	S	HUTS
INDS	L	INDUSTRIAL AREA
INLT	H	INLET
INLTQ	H	FORMER INLET
INSM	S	MILITARY INSTALLATION
INTF	T	INTERFLUVE
ISL	T	ISLAND
ISLF	T	ARTIFICIAL ISLAND
ISLM	T	MANGROVE ISLAND
ISLS	T	ISLANDS
ISLT	T	LAND-TIED ISLAND
ISLX	T	SECTION OF ISLAND
ISTH	T	ISTHMUS
ITTR	S	RESEARCH INSTITUTE
JTY	S	JETTY
KNLU	U	KNOLL
KNSU	U	KNOLLS
KRST	T	KARST AREA
LAND	L	ARCTIC LAND
LAVA	T	LAVA AREA
LBED	H	LAKE BED(S)
LCTY	L	LOCALITY
LDGU	U	LEDGE
LDNG	S	LANDING
LEPC	S	LEPER COLONY
LEV	T	LEVEE
LEVU	U	LEVEE
LGN	H	LAGOON
LGNS	H	LAGOONS
LGNX	H	SECTION OF LAGOON
LK	H	LAKE
LKC	H	CRATER LAKE
LKI	H	INTERMITTENT LAKE
LKN	H	SALT LAKE

LKNI	H	INTERMITTENT SALT LAKE
LKO	H	OXBOW LAKE
LKOI	H	INTERMITTENT OXBOW LAKE
LKS	H	LAKES
LKSB	H	UNDERGROUND LAKE
LKSC	H	CRATER LAKES
LKSI	H	INTERMITTENT LAKES
LKSN	H	SALT LAKES
LKSNI	H	INTERMITTENT SALT LAKES
LKX	H	SECTION OF LAKE
LOCK	S	LOCK(S)
LTER	A	LEASED AREA
LTHSE	S	LIGHTHOUSE
MAR	S	MARINA
MDVU	U	MEDIAN VALLEY
MDW	V	MEADOW
MESA	T	MESA(S)
MESU	U	MESA
MFG	S	FACTORY
MFGB	S	BREWERY
MFGC	S	CANNERY
MFGCU	S	COPPER WORKS
MFGLM	S	LIMEKILN
MFGM	S	MUNITIONS PLANT
MFGN	H	SALT EVAPORATION PONDS
MFGPH	S	PHOSPHATE WORKS
MFGQ	S	ABANDONED FACTORY
MFGSG	S	SUGAR REFINERY
MGV	H	MANGROVE SWAMP
MILB	L	MILITARY BASE
MKT	S	MARKET
ML	S	MILL(S)
MLM	S	ORE TREATMENT PLANT
MLO	S	OLIVE OIL MILL
MLSG	S	SUGAR MILL
MLSGQ	S	FORMER SUGAR MILL
MLSW	S	SAWMILL
MLWND	S	WINDMILL
MLWTR	S	WATER MILL
MN	S	MINE(S)
MNA	L	MINING AREA
MNAU	S	GOLD MINE(S)
MNC	S	COAL MINE(S)
MNCR	S	CHROME MINE(S)
MNCU	S	COPPER MINE(S)
MND	T	MOUND(S)
MNDT	S	DIATOMITE MINE(S)
MNDU	U	MOUND
MNFE	S	IRON MINE(S)
MNMT	S	MONUMENT
MNN	S	SALT MINE(S)
MNNI	S	NICKEL MINE(S)
MNPB	S	LEAD MINE(S)
MNPL	S	PLACER MINE(S)
MNQ	S	ABANDONED MINE
MNQR	S	QUARRY(-IES)
MNSN	S	TIN MINE(S)
MOLE	S	MOLE
MOOR	H	MOOR(S)
MOTU	U	MOAT
MRN	T	MORAINE
MRSH	H	MARSH(ES)
MRSHN	H	SALT MARSH
MSQE	S	MOSQUE
MSSN	S	MISSION
MSSNQ	S	ABANDONED MISSION
MSTY	S	MONASTERY
MT	T	MOUNTAIN
MTS	T	MOUNTAINS
MTSU	U	MOUNTAINS
MTU	U	MOUNTAIN

MUS	S	MUSEUM
MVA	L	MANEUVER AREA
NKM	T	MEANDER NECK
NOV	S	NOVITIATE
NRWS	H	NARROWS
NSY	S	NURSERY(-IES)
NTK	T	NUNATAK
NTKS	T	NUNATAKS
NVB	L	NAVAL BASE
OAS	L	OASIS(-ES)
OBPT	S	OBSERVATION POINT
OBS	S	OBSERVATORY
OBSR	S	RADIO OBSERVATORY
OCH	V	ORCHARD(S)
OCN	H	OCEAN
OILF	L	OILFIELD
OILJ	S	OIL PIPELINE JUNCTION
OILP	R	OIL PIPELINE
OILQ	S	ABANDONED OIL WELL
OILR	S	OIL REFINERY
OILT	S	TANK FARM
OILW	S	OIL WELL
OVF	H	OVERFALLS
PAL	S	PALACE
PAN	T	PAN
PANS	T	PANS
PASS	T	PASS
PCL	A	POLITICAL ENTITY
PCLD	A	DEPENDENT POLITICAL ENTITY
PCLF	A	FREELY ASSOCIATED STATE
PCLI	A	INDEPENDENT POLITICAL ENTITY
PCLIX	A	SECTION OF INDEPENDENT POLITICAL ENTITY
PCLS	A	SEMI-INDEPENDENT POLITICAL ENTITY
PEAT	L	PEAT CUTTING AREA
PEN	T	PENINSULA
PENX	T	SECTION OF PENINSULA
PGDA	S	PAGODA
PIER	S	PIER
PK	T	PEAK
PKLT	S	PARKING LOT
PKS	T	PEAKS
PKSU	U	PEAKS
PKU	U	PEAK
PLAT	T	PLATEAU
PLATX	T	SECTION OF PLATEAU
PLDR	T	POLDER
PLFU	U	PLATFORM
PLN	T	PLAIN(S)
PLNU	U	PLAIN
PLNX	T	SECTION OF PLAIN
PLTU	U	PLATEAU
PMPO	S	OIL PUMPING STATION
PMPW	S	WATER PUMPING STATION
PND	H	POND
PNDI	H	INTERMITTENT POND
PNDN	H	SALT POND
PNDNI	H	INTERMITTENT SALT POND(S)
PNDS	H	PONDS
PNDSF	H	FISHPONDS
PNDSI	H	INTERMITTENT PONDS
PNDSN	H	SALT PONDS
PNLU	U	PINNACLE
PO	S	POST OFFICE
POOL	H	POOL(S)
POOLI	H	INTERMITTENT POOL
PP	S	POLICE POST
PPL	P	POPULATED PLACE
PPLA	P	CAPTIAL OF A FIRST-ORDER ADMINISTRATIVE DIVISION
PPLC	P	CAPTIAL OF A COUNTRY (PCLD, PCLF, PCLI, PCLS)
PPLL	P	POPULATED LOCALITY
PPLQ	P	ABANDONED POPULATED PLACE

PPLR	P	RELIGIOUS POPULATED PLACE
PPLS	P	POPULATED PLACES
PPLW	P	DESTROYED POPULATED PLACE
PPLX	P	SECTION OF POPULATED PLACE
PPQ	S	ABANDONED POLICE POST
PRK	L	PARK
PRKGT	S	PARK GATE
PRKHQ	S	PARK HEADQUARTERS
PRMN	R	PROMENADE
PRN	S	PRISON
PRNJ	S	REFORMATORY
PRNQ	S	ABANDONED PRISON
PROM	T	PROMONTORY(-IES)
PRSH	A	PARISH
PRT	L	PORT
PRVU	U	PROVINCE
PS	S	POWER STATION
PSH	S	HYDROELECTRIC POWER STATION
PSTB	S	BORDER POST
PSTC	S	CUSTOMS POST
PSTP	S	PATROL POST
PT	T	POINT
PTGE	R	PORTAGE
PTS	T	POINTS
PYR	S	PYRAMID
PYRS	S	PYRAMIDS
QCKS	L	QUICKSAND
QUAY	S	QUAY
RAVU	U	RAVINE
RCH	H	REACH
RD	R	ROAD
RDA	R	ANCIENT ROAD
RDB	R	ROAD BEND
RDCUT	R	ROAD CUT
RDGB	T	BEACH RIDGE
RDGE	T	RIDGE(S)
RDGG	H	ICECAP RIDGE
RDGU	U	RIDGE
RDJCT	R	ROAD JUNCTION
RDST	H	ROADSTEAD
RDSU	U	RIDGES
RECG	S	GOLF COURSE
RECR	S	RACETRACK
REG	T	STONY DESERT
RES	L	RESERVE
RESA	L	AGRICULTURAL RESERVE
RESF	L	FOREST RESERVE
RESH	L	HUNTING RESERVE
RESN	L	NATURE RESERVE
RESP	L	PALM TREE RESERVE
RESV	L	RESERVATION
RESW	L	WILDLIFE RESERVE
RF	H	REEF(S)
RFC	H	CORAL REEF(S)
RFSU	U	REEFS
RFU	U	REEF
RFX	H	SECTION OF REEF
RGN	L	REGION
RGNE	L	ECONOMIC REGION
RGNL	L	LAKE REGION
RHSE	S	RESTHOUSE
RISU	U	RISE
RJCT	R	RAILROAD JUNCTION
RK	T	ROCK
RKFL	T	ROCKFALL
RKRY	S	ROOKERY
RKS	T	ROCKS
RLG	S	RELIGIOUS SITE
RLGR	S	RETREAT
RMPU	U	RAMP
RNCH	S	RANCH(ES)

RNGA	L	ARTILLERY RANGE
RNGU	U	RANGE
RPDS	H	RAPIDS
RR	R	RAILROAD
RRQ	R	ABANDONED RAILROAD
RSD	S	RAILROAD SIDING
RSGNL	S	RAILROAD SIGNAL
RSRT	S	RESORT
RSTN	S	RAILROAD STATION
RSTNQ	S	ABANDONED RAILROAD STATION
RSTP	S	RAILROAD STOP
RSTPQ	S	ABANDONED RAILROAD STOP
RSV	H	RESERVOIR(S)
RSVI	H	INTERMITTENT RESERVOIR
RSVT	H	WATER TANK
RTE	R	CARAVAN ROUTE
RUIN	S	RUIN(S)
RVN	H	RAVINE(S)
RYD	R	RAILROAD YARD
SALT	L	SALT AREA
SAND	L	SAND AREA
SBED	T	DRY STREAM BED
SBKH	H	SABKHA(S)
SCH	S	SCHOOL
SCHA	S	AGRICULTURAL SCHOOL
SCHC	S	COLLEGE
SCHM	S	MILITARY SCHOOL
SCHN	S	MARITIME SCHOOL
SCNU	U	SEACHANNEL
SCRB	V	SCRUBLAND
SCRP	T	ESCARPMENT
SCSU	U	SEACHANNELS
SD	H	SOUND
SDL	T	SADDLE
SDLU	U	SADDLE
SEA	H	SEA
SHFU	U	SHELF
SHLU	U	SHOAL
SHOL	H	SHOAL(S)
SHOR	T	SHORE
SHPF	S	SHEEPFOLD
SHRN	S	SHRINE
SHSE	S	STOREHOUSE
SHSU	U	SHOALS
SHVU	U	SHELF VALLEY
SILL	H	SILL
SILU	U	SILL
SINK	T	SINKHOLE
SLCE	S	SLUICE
SLID	T	SLIDE
SLP	T	SLOPE(S)
SLPU	U	SLOPE
SMSU	U	SEAMOUNTS
SMU	U	SEAMOUNT
SNOW	L	SNOWFIELD
SNTR	S	SANITARIUM
SPA	S	SPA
SPIT	T	SPIT
SPLY	S	SPILLWAY
SPNG	H	SPRING(S)
SPNS	H	SULPHUR SPRING(S)
SPNT	H	HOT SPRING(S)
SPRU	U	SPUR
SPUR	T	SPUR(S)
SQR	S	SQUARE
ST	R	STREET
STBL	S	STABLE
STDM	S	STADIUM
STKR	R	STOCK ROUTE
STLMT	P	ISRAELI SETTLEMENT
STM	H	STREAM

STMA	H	ANABRANCH
STMB	H	STREAM BEND
STMC	H	CANALIZED STREAM
STMD	H	DISTRIBUTARY(-IES)
STMH	H	HEADWATERS
STMI	H	INTERMITTENT STREAM
STMIX	H	SECTION OF INTERMITTENT STREAM
STMM	H	STREAM MOUTH(S)
STMQ	H	ABANDONED WATERCOURSE
STMS	H	STREAMS
STMSB	H	LOST RIVER
STMX	H	SECTION OF STREAM
STNB	S	SCIENTIFIC RESEARCH BASE
STNC	S	COAST GUARD STATION
STNE	S	EXPERIMENT STATION
STNF	S	FOREST STATION
STNI	S	INSPECTION STATION
STNM	S	METEOROLOGICAL STATION
STNR	S	RADIO STATION
STNS	S	SATELLITE STATION
STNW	S	WHALING STATION
STPS	S	STEPS
STRT	H	STRAIT
SWMP	H	SWAMP
SYSI	H	IRRIGATION SYSTEM
TAL	T	TALUS SLOPE
TERR	A	TERRITORY
TERU	U	TERRACE
TMB	S	TOMB(S)
TMPL	S	TEMPLE(S)
TMSU	U	TABLEMOUNTS (OR GUYOTS)
TMTU	U	TABLEMOUNT (OR GUYOT)
TNGU	U	TONGUE
TNKD	S	CATTLE DIPPING TANK
TNL	R	TUNNEL
TNLC	H	CANAL TUNNEL
TNLN	R	NATURAL TUNNEL
TNLRD	R	ROAD TUNNEL
TNLRR	R	RAILROAD TUNNEL
TNLS	R	TUNNELS
TOWR	S	TOWER
TRB	L	TRIBAL AREA
TREE	V	TREE(S)
TRGD	T	INTERDUNE TROUGH(S)
TRGU	U	TROUGH
TRIG	S	TRIANGULATION STATION
TRL	R	TRAIL
TRMO	S	OIL PIPELINE TERMINAL
TRNU	U	TRENCH
TRR	T	TERRACE
TUND	V	TUNDRA
UPLD	T	UPLAND
USGE	S	UNITED STATES GOVERNMENT ESTABLISHMENT
VAL	T	VALLEY
VALG	T	HANGING VALLEY
VALS	T	VALLEYS
VALU	U	VALLEY
VALX	T	SECTION OF VALLEY
VETF	S	VETERINARY FACILITY
VIN	V	VINEYARD
VINS	V	VINEYARDS
VLC	T	VOLCANO
VLSU	U	VALLEYS
WAD	H	WADI
WADB	H	WADI BEND
WADJ	H	WADI JUNCTION
WADM	H	WADI MOUTH
WADS	H	WADIES
WADX	H	SECTION OF WADI
WALL	S	WALL
WALLA	S	ANCIENT WALL

WEIR	S	WEIR(S)
WHRF	S	WHARF(-VES)
WHRL	H	WHIRLPOOL
WLL	H	WELL
WLLQ	H	ABANDONED WELL
WLLS	H	WELLS
WRCK	S	WRECK
WTLD	H	WETLAND
WTLDI	H	INTERMITTENT WETLAND
WTRC	H	WATERCOURSE
WTRH	H	WATERHOLE(S)
WTRW	S	WATERWORKS
ZN	A	ZONE
ZNB	A	BUFFER ZONE
ZNF	S	FREE TRADE ZONE
ZNL	A	LEASED ZONE
ZOO	S	ZOO

History

New functions in *QV* 3

Completely new programming of the code, new compiler with a significantly improved performance.

Simplified, modernised screen with new, removable and dockable toolboxes and windows.

Up to three map windows can be opened at the same time in the full version. For example, a route can be worked out precisely on a detailed map while in another window the whole route remains visible in the overview map. In online mode, you will see your position at the same time in different maps.

New layer manager to retain an overview of all open maps with all the markings included quite easily. Levels can be shown and hidden.

The improved AutoNEW function makes it easy to create and change routes, even at the same time in several map windows. Elastic band when creating and changing points, precise entry of new points by direct entry of either coordinates or distance and direction or distance in X/Y direction.

New EasyNEW function: A new route, a new track or new waypoints can be created immediately without the need to select a database and table first. These are saved automatically in "My Data".

Drawings now with a 2 level hierarchy. Just as waypoints can be grouped into routes, now drawing elements (i.e. rectangles, circles etc.) can be grouped into drawings.

Printing on several pages can be done easily. The section can be specified easily by simply moving the area to be printed directly on the map. Create pages to be printed directly from the map with the pop-up menu. Fill a whole page true to scale; print true to scale over several pages.

External links to files or Internet addresses are now shown on the map with the markings. Thus these links can be opened directly from the map simply by clicking on them. A miniature view is created for photos. Digital photos can automatically be allocated to a track using a time comparison.

GPS online mode completely new: instruments that can be set freely, function that can be placed as you like and route navigation with display of direction/ distance to the destination.

Multitracking using NMEA. Using a configurable station ID position signals can be allocated to the relevant vehicle and displayed separately. In the full version 2 vehicles can be tracked. licence extensions can be purchased for additional vehicles.

"Active map extent"

Garmin data transfer with later GPS units now up to 12 times faster because of the higher transfer rate.

IGC track logs can be imported using Import in *X-Plorer*. Overlays too (only poly lines) both as a track and also as a drawing.

Full support for Lowrance USR files via Import/Export in *X-Plorer*.

Track replay with record function, creates an AVI file.

X added to XY diagram, jumps to the corresponding place in *X-plorer*.

New **Special functions** button in *X-Plorer* combines all functions that can otherwise only be reached via a pop up menu, such as digital camera support etc.

All pop up menus standardised. New: **Color** to quickly change the color of a marking directly on the map.

All the different settings combined centrally in a new settings window.

Markings window completely revised in the same style. With multiple selections in *X-Plorer* only the changed settings will be applied. Background color for each element can now be set separately.. Also trackpoints can now have their own color.

Tracks: New database fields: Track date, duration and time zone

trackpoints now with clear numbering even when re-sorted in *X-Plorer*.

Edit tracks: The **Color selection window** pop up menu assigns another color to the selected trackpoints. The **Copy window selection** pop up menu copies the window selection. This can then be added to another track in *X-Plorer*. Thus an easy graphic combination of partial tracks into a new track.

Track reduction expanded:
Maximum number of trackpoints can be selected. Can be called up from *X-Plorer* using the Special functions menu. Save a calculated road route as a track. Can immediately be reduced automatically to a maximum number of points.

Drawing elements can then be copied in *X-Plorer* and added to tracks.

Extension of the GPS name check: New **Compare name and coordinates** button checks for real duplicates. (as before): Finds WP's that have the same name but different co-ordinates: Only finds WP's that have the same name AND the same coordinates. **Mark-X**: Selects all WP's found in *X-Plorer* for easy further processing (e.g. delete, copy etc.).

Navtech map can be overlaid on any grid map: Open the grid map as usual then right click on the Navtech map in the *X-Plorer* and select **Show (Overlay)** from the pop up menu.

Routing: List of the last waypoints used in the routing window. The 10 last used WP's, ODB entries or addresses from the vector data search are listed here. trackpoints, map points and route WP's are not saved.
TTQV Internet Update Check added as a new item to the **?** menu so that you can easily look up whether there are any new updates.

New functions in *QV* 2.51

A new interface in QV in order to send easily maps including its calibration from *QV* to PathAway.
A new interface in QV to transmit waypoints, routes and tracks between PathAway and QV.
A new multipage function. With this function several pages along the route can be printed out automatically at any scale.
The German version of PathAway, a GPS navigation software for PDA with Palm-OS version 3 or higher.
In addition, PathAway can load waypoints, routes and tracks from Garmin® GPS devices. With this new feature it is possible to collect track data as many as you like. During your journey just save your data on a small Palm PDA with PathAway.
In addition to the well known vector maps of Teleinfo, we now included in our program vector maps of the company Navtech. These maps are available one by one or in a set together with the Palm navigation software Digi-Map 2002 from Harald Körtge.
There is a new interface in QV for the creation of routes and maps for Digi-Map 2002 on the basis of Navtech vector maps, and to send these directly to a Palm device. Furthermore, tracks stored in a Palm by Digi-Map 2002 can be loaded and saved in QV.

New functions in *QV* 2.5

The Teleinfo vector map, Teleatlas, street names in Europe.
Street routing, calculating the fastest, best or shortest route using start and destination point information.
Intermediate stops are possible with automatic distance optimisation.
Results as a traditional route description, as a GPS route of the important stations or as a GPS track with the exact road sequence for uploading into a GPS or also as a Roadbook.
Uploading the route into the GPS or printing out into a Roadbook for simple navigation.
Search for post codes, towns, city parts, street names and sometimes even house numbers with the Teleinfo CDs throughout Europe.
Rapid calculation of a route from the current position to the destination in online mode.
Night mode, dimmed screen for journeys with a laptop at night.
Information on track and waypoint altitudes is now managed in the database.
Information on altitudes can also be obtained from DEMs (Digital Elevation Models).
Currently the USGS Globe 30 Program DEMs and the Top50v3 CD DEMs are supported.
XY diagram: new tool for graphical evaluation and representation of tracks and routes.
Speed, altitude from the GPS or altitude from the DEM can be recorded and checked depending on the distance or the journey time.
3D diagram: new tool for showing altitude information. Tracks and routes are drawn three-dimensionally and can be shown with a 3D model of the region from the DEMs. You can “fly” through this imaginary world using the keyboard arrows.
External links to *QV X-Plorer*: File names, directory names, web links and e-mail addresses can be allocated WPs, tracks, routes and maps. The link or links then appear underlined in blue in the info field and can be opened by clicking on them.
Long routes and tracks can now be divided up automatically.
Before uploading data into the GPS the name can be checked to avoid overwriting files with the same names.
Support for MLR GPS units
Reads Lizardtech SIC maps.
Simplified calibration by importing Word files.
Most windows can now be maximised.
Track replay has been linked with the XY and 3D diagrams.
New setup program.
And many small improvements in detail and bugs fixed (as always)

New functions in *QV* 2.0

If you know QuoVadis 1.62, here are some changes and new functions.
The name has changed from **QuoVadis** to **Touratech QV**
Complete revision of surfaces, symbols and menu bars
Completely new database and with QV *X-Plorer* a standard, simple to learn tool for managing all data. Link

from map.mdb to the maps in the directory is no longer there. The old WP, route and track windows are no longer there.
Maps opened simply from CD ROMs with *X-Plorer*.
Simple organization of data with drag and drop or copy and paste
Improved print out of any lists
Database that can be used on a network
Powerful search functions
Supports GPS receivers by Magellan, Lowrance and Eagle
Supports NMEA equipment
Various national grids installed (Gauss_Krüger for example), or many of your own grids and data can also be compiled
Calculates the magnetic declination at any point
Different mouse pointers can be selected in the map window:
right angle crosshairs, GPS north, magnetic north, map grids and magnifying glass.
Considerably quicker image appearance with many markings on the map. Number of visible markings almost unlimited.
New drawing functions to create lines, circles, areas, freehand lines, labeling on the map with area calculation
Road book editor for automatic conversion of a route into a printable road book with map clips.
Imports routes from route planners by Map & Guide and Marco Polo.
Opens ECW-Images
And lots more!

New functions in *QV* 1.6

New look with new toolbar and status bar.
Calibration is in conformity with projection, if parameters of map are known. This new version contains more than 60 different map projections.
GPS online mode is completely revised, supports the Garmin PVT protocol.
Uniform input / output box for coordinates.
New function: Search point in all maps. The point you are looking for can be entered in all coordinate systems supported by QV.
New function: You can identify the country below the mouse pointer. The name of country is displayed.
all projection types QV supports.
North arrow can be projected on the map.
If you press and hold the left mouse button, the map within the map window can be scrolled in real time by moving the mouse.
Support of NOAA(BSB) maps. These maps are already calibrated and can be directly opened from CD.
NOTE: This function is BETA in this version. Not all types of NOAA(BSB) maps can be opened at this time.
Please check our homepage for updates.

New functions in *QV* 1.52

Demo version now with all functions for 25 days.
This version of QV is a real 32bit program. For this reason, there is no version for Windows 3.11 anymore, although QV 1.51 for Windows 3.11 still is on this CD (\16\SPRACHE\SETUP.EXE). But, we do not develop further this version.
Unfortunately, the Geographic Names Database cannot be used anymore with Windows 3.11.
Maps can now be saved in JPEG or GIF format. This saves memory on hard disc, but increases the time for loading
since the computer will internally always works with a 256 colors BMP format.
QV can be started with the following parameters:
ODB opens the Geographic Names Database during program start
ONLINE immediately opens the Garmin Online Mode
“File" immediately opens the map “File".

New functions in *QV* 1.51

The slider in map window moves the map within the map window in real time (with zoom 1:1 only).
In route and track window you can now mark several entries from the list by holding CTRL or SHIFT key while clicking with mouse.
SHOW, PRINT, DELETE and SEND/EXPORT then process all marked routes and tracks.
With the function **Reduce Track** trackpoints can be deleted, if requested.
You can show trackpoints by any character via **Options - Marks** or **Style** in pop-up menu.
Saving of track in database is now 90% faster, showing track is 30% faster.

Program can be operated in English or German (**Options – Settings - General**).
Clearer cross hair in the map window.
In the field **Point** in Main Window you can now enter the point which shall be displayed on the map. It is even possible with the overview map.
When calibrating even tenth seconds can be entered.
When calibrating UTM maps you do not need to enter the zone letter anymore.
With **File – Export Calibration** you can save the map calibration in a text file. This map can then be copied together with this file to another directory or to another computer without loosing the calibration. During calibration this file is created automatically.
In the three database windows WP, route and track you can create a text file with the marked data by clicking the right mouse button on **Send / Export**. This text file can then be imported to another computer.
And many further little improvements and corrections.

New functions in *QV* 1.5

The main feature of the new QV 1.5 is that now you can work with several maps and that various functions are integrated into the right mouse button.
The new function OVERVIEW shows you on a simple overview map all maps you have on your hard disk in form of a rectangle true to scale You can open it by double click.
We supply overview maps of the whole world, Europe, Africa, ,Asia, Australia, North and South America.
Own overview maps can be defined easily.
The overview map can remain open in the background, but also be closed.
With the new function AUTOMAP always the current map is opened, whether you travel in Online mode or when you reached the map border and need the neighboring map or if you press SHOW and the current map does not contain this point. Also the function MARK OF FILE will find the right map itself.
With the right mouse button you can now open a pop-up menu at any point you like, see a list of all maps which contain this point and neighbouring maps. Thus, you can open the corresponding map immediately and change between two maps of the same region.
Waypoint, route and track marks also have pop-up menus. With the right mouse button you can save waypoints, routes and tracks, append them to the active route, delete marks or data or you can open the database.
If you change maps, the marks of waypoints, routes and tracks remain in the same directory and will be automatically calculated and drawn new. Thus, the maps can be compared.
Routes may cover several maps.
You always see all maps and waypoints/routes in the current directory. As option, the function AutoMAP and the Map Overview can also work with all maps from the hard disk.
In the window UTM Calculator, the datum/ellipsoid list can be extended by other entries. So, also exotic UTM maps can be used.
The marks of routes and tracks can be moved by mouse. Up to today, this was only possible with waypoint marks.
Totally new is the track window, which - similar to the route and waypoint window - makes an administration of your tracks possible.
The function "Maintain Database“ is extended by a map import function. Now, you can copy calibrated maps from one directory into another, without losing the calibration.
New function: **EXTERNAL DATABASE** with about 5.000.000 places and coordinates of the whole world with direct access to maps of the single countries.
Furthermore, you can also calibrate maps with Swiss Grid.
The calibration is much simplified by relief lines. QV can now foresee the position of next point in map and moves the map section correspondingly.
The list of map reference systems (datum/ellipsoid) had been extended to in total 145. Now, all map reference systems of Garmin and even some others are available.
Reception of Garmin data is now done via a new central window.

Licence agreements

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In the same way these provisions also apply to sales or contractual partners who sell or resell our software or software versions with special functions derived from it to third parties. Regulations arising in this context from special functionalities or the passing on of use rights to third parties are dealt with separately under clause 11.

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(ii) all additional TT QV software applications that you may order and install from time to time.

If you do not possess a TT QV version licence this software may not be loaded onto a computer or copied. Here the type of software version defines the type of licence and the range of functions that can be used. Excluded from this is our free downloadable demo version that is installed for a period of 25 days and can be tested with the full range of functions.

It is advisable to read the contractual conditions carefully before you install and use the software. By installing this software you confirm that you accept these contractual conditions. If you do not accept these contractual conditions please return the whole software package with licence data and documentation immediately. The purchase price will only be refunded if you provide a written declaration confirming that you have destroyed your licence data and have uninstalled the software.

This is a licence contract and not a sales contract.

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Touratech AG offers all licencees a free, usable web presence with Internet download and support forum. With this you have the right to download the latest software updates at any time of the day or night. Also all software updates within a main release range are free. Software that is supplied as an upgrade or an update to an earlier licenced version replaces the previous version. No additional licence is granted. The number of installed updates may not exceed the number of original licences.

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You are responsible for monitoring, adminstering and using the software in your company and are also obliged to control this in your sphere of influence. In particular it is your responsibility to ensure that

(1) The software is suitable for the intended use.

(2) The software is used in accordance with these licence conditions.

(3) The necessary accuracy for your application in connection with the hardware components used can also be achieved.

(4) Suitable measures will be taken to prevent data losses in system crashes.

(5) The software is not used for ethically reprehensible purposes. This includes in particular military use if this cannot clearly be classified as peacekeeping measures or humanitarian purposes and all forms of human trade or transportation.

The software is a tool that is designed exclusively for use by trained personnel. It should not be used under any circumstances as a replacement for a professional assessment by appropriately trained personnel. In navigation applications we can give no guarantee for the accuracy of maps, GPS positions or co-ordinate and route calculations. You navigate only under your own responsibility!

You bear sole responsibility for any results obtained from using the software.

7. Restricted guarantee, exceptions and liability disclaimers

7 a Restricted guarantee

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(ii) if prescribed in law, to offer another solution.

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(iv) A failure on your part to incorporate and use all the updates to the software that Touratech provides.

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12. Map material

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The corresponding map publisher's licence conditions apply to all maps that have been obtained from TT QV as an optional extra. Under licensing law these must be regarded as separate from the use conditions of this licence agreement.

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