Documentation

Version 5.12.21

Need help or have a suggestion? Send a mail to support@meltemus.com

qtVlm is developed in the hope that it will be useful, but without any guaranty. qtVlm does not replace traditional navigation methods, nor printed paper charts.

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Quick Start

Installation

qtVlm versions for PC (Windows/Linux/MacOS) as well as Raspberry PI2, PI3 and PI4 are available here:

http://www.meltemus.com

Mobile versions (**Android** et **iOS**) are available through their respective stores. More information about mobile versions at the end of this introduction.

In all cases and on all platforms, you will be asked to download qtVlm's maps (gshhs), the first time.

Windows:

Installing is made through qtVlm's installer. 32 bits Windows versions are not supported anymore, except for the Windows tablet version. Minimum Windows version is Windows 7.

Linux

Installation is made by uncompressing the gz archive. Then to start qtVlm just run "./qtVlm". A directory ".qtVlm" containing user data will be created. Please note that qtVlm must be launched from it's directory.

Note 1: On some Linux distributions you might need to also install SSL libraries.

Note 2: If you get a message concerning XCB at startup, especially on Ubuntu 20.04 and after, then you should probably run:

sudo apt install libxcb-xinerama0

Note 3: You should not install qtVlm in a directory with a path containing special characters like accents.

MacOS:

Just double-click on qtVlm_install which is located at the root of the DMG. It will ask you for an installation folder, which must either be empty or contains a previous installation of qtVlm.

Alternatively, you can install qtVlm by copying the folder "qtVlm" contained in the DMG somewhere on your local disk. Then you can run qtVlm from this local folder. It is not possible to run qtVlm directly from the DMG disk.

Raspberry:

In a terminal, **u**n-compress the archive with the command:

```
tar zxvf qtVlm-5.12.7-rpi.tar.gz
```

then you can run qtVlm with:

```
cd qtVlm
./qtVlm
```

Please note that qtVlm must be launched from its directory.

You can also run: ./qtVlm_touchscreen for a pure tactile version.

Note 1: On some old versions of Raspbian, for instance Jessie coming together with openPlotter, it is necessary to launch qtVlm with:

./qtVlm -platform xcb

Note 2: If you want to create a shortcut for qtVlm on Raspberry on the desktop, you can follow instructions contained in the file instructions_launcher_rpi.txt

Note 3: it has been reported some issues with sound and RPI4/latest OS. If you have this problem, you can try:

sudo apt -y purge "pulseaudio*" and reboot.

Note 4: You should not install qtVlm in a directory with a path containing special characters like accents.

Note 5: On some recent Raspi versions, you can have a problem with xcb although all is installed correctly. If that is the case, you can try:

cd /usr/lib/arm-linux-gnueabihf

ln -s libxcb-util.so.1 libxcb-util.so.0

Polar files

Via the menu "*boat->boat settings*" you can choose a polar for your boat. qtVlm comes with some typical polar files, and you can easily create or import a personalized one. It is possible to alter a polar by applying a coefficient on it, you can specify delays for tacking and gybing, or under which speed you decide to start the engine, etc. There is also the possibility to define "waves polar", describing the behavior of the boat depending on sea conditions.

More about polar files

Environment

qtVlm is divided in several areas: the toolbar and the main menu, the map and its objects, instruments and status bar, plus several boards. The main dashboard is displayed or hidden by clicking on the microboard, on the right side of the screen, or through the dedicated icon on the toolbar.

The selection tool can be used to select an area on the map and can also be invoked with the mouse and the <shift> key.

More about qtVlm environment

Gribs and Weather Images

qtVlm can open or download a wide number of grib types, being grib 1 or grib 2. There are 3 slots where a grib can be loaded. One can for instance load a Winds grib in the first slot, and a Currents grib in the second one. It can also be used to load gribs with the same data at different resolutions. Data displayed on the map can be configured fully through the grib display control available in the toolbar. qtVlm will always use the data with the better resolution, regardless of the slot number.

It is also possible to configure custom grib addresses for all three slots, for instance:

qtVlm is **Iridium GO! certified** for Android and iOS. It can request and receive gribs via "Iridium Mail and Web" or XGate applications.

qtVlm can download directly gribs from Xygrib and Squid, eventually through Iridium GO!.

ftp://ftp.bsh.de/Stroemungsvorhersagen/grib2 (Currents North Europ)

SKIRON gribs are also a very useful resource:

https://www.openskiron.org/gribs_wrf_4km
https://www.openskiron.org/gribs_wrf_12km
https://www.openskiron.org/gribs_skiron
https://www.openskiron.org/gribs_icon_eu
https://openskiron.org/gribs_icon-d2_latest
https://www.openskiron.org/saildocs

qtVlm also allows displaying weather images over the map. It accepts all image formats, and up to 8 slots can be pre-configured. Since version 5.7.3 it can also display kml and kmz images for instance from:

https://ocean.weather.gov/gis/index.php
https://earthdata.nasa.gov/earth-observation-data/near-real-time/rapid-response/modis-subsets

More about gribs and weather images

Charts

Several map types are available (menu "*qtVlm->Configuration*").

Gshhs and mbtiles charts

These charts are the gshhs maps, which in fact contains the coast lines used by qtVlm in Routes and Routings modules, and mbtiles charts. It is also there that are managed charts coming from Visit My Harbour.

Online charts

VLM tiles are the identical to gshhs maps, plus some color to represent altitude.

OpenStreetMap tiles, available on mobile (Android et iOS) only,

OpenSeaMap tiles, which can be displayed over any other type of maps,

Wikimedia tiles,

OpenTopoMap tiles.

Raster and Vector charts

Vectors charts (**S57**) are supported by qtVlm. IHO Certified, qtVlm also reads **S63 charts** like the one sold by chartworld or other chart providers. **CM93** charts are also supported.

qtVlm can also display georeferenced maps in **kap, geotiff, geojpeg, etc** format. A folder containing these maps can be configured, or these maps can just be copied in qtVlm default kaps folder. **NVCharts** are supported only on Windows platform.

Similarly, qtVlm can read and display maps in **mbtiles** format, that also just must be copied in a dedicated folder.

Charts type selection from toolbar

The choice between the different chart types can be made directly using the toolbar.

These icons let you choose between Online charts, Raster charts, Mbtiles charts, Vector charts and CM93 charts.

An option available in the configuration screen allows choosing whether rasters are displayed over or under mbtiles, in case both maps are available for the area.

Another parameter defines if the grib is displayed over kaps and mbtiles, with which transparency.

More about charts

NMEA Connections

qtVlm can connect to a lot of various NMEA sources (serial port, internal GPS, GPSD, TCP, UDP, file replay, B&G WebSocket, etc.). Several sources can be used simultaneously.

NMEA 2000 is not supported, a convertor must be added.

Most NMEA messages are implemented and are used to feed instruments and/or AIS module.

More about NMEA connections

AIS Module

qtVlm allows displaying and managing AIS targets received through NMEA sources. It can calculate a CPA and a TCPA and manages configurable alarms.

A simulation mode is proposed in qtVlm, through a collaboration with **sinagot.net** and **AisHub.com**. It receives real AIS targets via Internet, and allows simulating sailing between them, using gribs data and polar to move the boat. This mode is accessible via the menu "*Boat->Simulation mode*".

Besides Simulation Mode, these internet AIS targets are also available in Real Mode.

ARPA targets (radar) are also supported.

[More about AIS module]

Instruments and Board

Most of classical instruments are available in qtVlm. They appear at the bottom of the screen or on the left side, depending on the screen orientation. They can be hidden or shown with the toolbar instrument button . An independent panel can also be displayed through the icon.

Dials can be shown and hidden by clicking on the numerical displays. Use long click to display **histograms**.

Instruments sizes and positions can be easily changed, and It is possible to select which instruments are displayed.

[More about instruments and dashboard]

Weather Routing Module

The main qtVlm function is the ability of calculating routings and routes, based on grib data and boat's polar.

Once one or several gribs and a polar have been loaded, a routing can be very easily generated, for instance by right-clicking on a POI or anywhere on the map.

It is also possible to ask for a multi-routing, in which case qtVlm will generate several routings to determine the best starting date and time, based on numerous factors.

The result of the multi-routing calculation is displayed in a Routes Comparator, which can be exported in CSV format. Columns can be hidden of shown.

Colour	Name	Start Date	ETA	Duration	Ortho distance	Sailed Distance	Avg BS	Max BS	Min BS	Avg TWS	Max TWS	Min TWS
	Routing1 01 juin-00:22	01/06/2016 00:22	01/06/2016 19:52	0 d 19 h 30 m	85.74 NM	102.14 NM	5.23 kts	5.55 kts	4.75 kts	12.48 kts	17.33 kts	7.36 kt
	Routing1 01 juin-02:22	01/06/2016 02:22	01/06/2016 22:22	0 d 20 h 0 m	85.74 NM	103.39 NM	5.16 kts	5.55 kts	4.55 kts	11.65 kts	16.47 kts	6.27 kt
	Routing1 31 mai-18:22	31/05/2016 18:22	01/06/2016 12:52	0 d 18 h 30 m	85.74 NM	99.55 NM	5.38 kts	5.56 kts	5.15 kts	16.26 kts	19.79 kts	11.37 kt
	Routing1 31 mai-20:22	31/05/2016 20:22	01/06/2016 15:12	0 d 18 h 50 m	85.74 NM	99.89 NM	5.30 kts	5.59 kts	4.97 kts	14.96 kts	18.84 kts	9.25 kt
	Routing1 31 mai-22:22	31/05/2016 22:22	01/06/2016 17:27	0 d 19 h 5 m	85.74 NM	100.68 NM	5.27 kts	5.58 kts	4.74 kts	13.61 kts	18.10 kts	8.28 kt

Pathways can also be used as targets for routing, in which case the routing will follow a path, going to each point in turn.

Once the routing calculation is terminated, it is possible to convert it in a Route, and then optionally to simplify and optimize the resulting route. This can be done automatically if the option "convert to route" is checked before launching the routing calculation.

Many other options are available, like for instance asking for pivot points, calculating inversed isochrones, placing barriers, multi-points routing, etc.

[More about Weather Routing Module]

Routes Module

Route in qtVlm allows several navigation modes between POIs (vbvmb, vmg or Great Circle). It can also display and export in CSV format the route's log containing many information.

Route | Route logbook | Histograms | Statistics

Export (CSV format) ☐ With raw data ○ HDG dev

	TWS	TWD	TWA	SAILS	STW	CTW (T)	SOG	COG (T)	AWS	AWA	CS	CD
30/04/2019 14:30	8.11 kts	153.23°	140.50°	GV + Sym	8.49 kts	12.73°	8.49 kts	12.73°	5.62 kts	-66.58°	N/A	N/A
30/04/2019 14:35	8.08 kts	153.76°	140.50°	GV + Sym	8.47 kts	13.26°	8.47 kts	13.26°	5.61 kts	-66.52°	N/A	N/A
30/04/2019 14:40	8.05 kts	154.59°	140.30°	GV + Sym	8.47 kts	14.29°	8.47 kts	14.29°	5.62 kts	-66.11°	N/A	N/A
30/04/2019 14:45	8.01 kts	155.47°	140.30°	GV + Sym	8.44 kts	15.17°	8.44 kts	15.17°	5.60 kts	-66.01°	N/A	N/A
30/04/2019 14:50	7.97 kts	156.37°	140.30°	GV + Sym	8.41 kts	16.07°	8.41 kts	16.07°	5.58 kts	-65.90°	N/A	N/A
30/04/2019 14:55	7.94 kts	157.32°	140.20°	GV + Sym	8.40 kts	17.12°	8.40 kts	17.12°	5.58 kts	-65.63°	N/A	N/A
30/04/2019 15:00	7.88 kts	158.21°	140.20°	GV + Sym	8.36 kts	18.01°	8.36 kts	18.01°	5.55 kts	-65.48°	N/A	N/A
30/04/2019 15:05	7.83 kts	159.14°	140.00°	GV + Sym	8.34 kts	19.14°	8.34 kts	19.14°	5.55 kts	-65.01°	N/A	N/A
30/04/2019 15:10	7.77 kts	160.21°	140.00°	GV + Sym	8.30 kts	20.21°	8.30 kts	20.21°	5.52 kts	-64.83°	N/A	N/A
30/04/2019 15:15	7.71 kts	161.30°	140.00°	GV + Sym	8.25 kts	21.30°	8.25 kts	21.30°	5.48 kts	-64.64°	N/A	N/A
30/04/2019 15:20	7.64 kts	162.42°	140.00°	GV + Sym	8.20 kts	22.42°	8.20 kts	22.42°	5.45 kts	-64.45°	N/A	N/A
30/04/2019 15:25	7.58 kts	163.54°	140.00°	GV + Sym	8.16 kts	23.54°	8.16 kts	23.54°	5.41 kts	-64.24°	N/A	N/A
30/04/2019 15:30	7.51 kts	164.69°	140.00°	GV + Sym	8.11 kts	24.69°	8.11 kts	24.69°	5.37 kts	-64.03°	N/A	N/A
30/04/2019 15:35	7.44 kts	165.86°	140.00°	GV + Sym	8.06 kts	305.86°	8.06 kts	305.86°	5.33 kts	63.81°	N/A	N/A
30/04/2019 15:40	7.39 kts	165.91°	140.00°	GV + Sym	8.02 kts	25.91°	8.02 kts	25.91°	5.30 kts	-63.64°	N/A	N/A
30/04/2019 15:45	7.32 kts	167.08°	140.00°	GV + Sym	7.97 kts	307.08°	7.97 kts	307.08°	5.26 kts	63.41°	N/A	N/A
30/04/2019 15:50	7.27 kts	167.14°	140.00°	GV + Sym	7.93 kts	307.14°	7.93 kts	307.14°	5.23 kts	63.24°	N/A	N/A
30/04/2019 15:55	7.22 kts	167.19°	140.00°	GV + Sym	7.89 kts	27.19°	7.89 kts	27.19°	5.21 kts	-63.06°	N/A	N/A

[More on Routes Module]

POIs and Barriers

POIs (Point of Interest) are point that can be placed in qtVlm. They can be used for a variety of tasks, like start or arrival points for routes or routings. They can also be defined as the active boat's WP, and as such be sent on NMEA output.

Laylines can also be displayed (from grib or NMEA data). Currents are considered.

It is also possible to create barriers, that will be avoided by Routings and Routes modules.

[More about POIs and barriers]

Start Line Mode

This mode can be activated from “boat” menu. It manages a race chronometer with two configurable tops and displays time and distance to line. A safety zone can also be displayed over the start line.

Currents and boat dimensions are taken into account.

More about Start Line Mode

Mobiles Versions (Android and iOS)

Android and iOS versions are available on Google Play Store or Apple Store. While PCs versions are 100% free, the full version must be purchased to benefit from all the functionalities. Once activated, the full version is available for all your devices for this operating system, which means that an Android license works on all your Android devices, and an iOS license works on all your iOS devices).

The full version activation adds:

- **Routes** and **Routings** modules, **Rasters, S57, S63, CM93 and Mbtiles** modules.
- **Instruments** and **AIS** modules.
- Support of **Harmonics** files (Tides and Currents).
- **Iridium** grib requests, and Great Circle (Squid) grib download or requests.

qtVlm on mobiles is designed to be used together with the PC versions. It is possible to load gribs, maps and so on, to prepare routes and routings on PC and then transfer all to Android or iOS devices.

To achieve this, on the PC side just go to *qtVlm->export*, then copy the resulting zip file on the mobile device (on iOS this can be done for instance via iTunes or AirDrop) and run the import function. Depending on which options were used, the mobile device will then be in the same configuration, with the same maps, routes, gribs, polars, etc.

Mobiles versions are also of course useable without PC at all. All the functions described in this document are available on Android and iOS versions.

Google Play Store

Apple Store

File management on mobile versions

Android

On Android a PC file manager can be used to manage directly qtVlm files. There is a qtVlm folder at the root of your internal card, where you can find all sub-folders like gribs, kaps, S57, mbtiles, etc. Please note that most of these folders (including gshhs maps) can eventually be transferred on an external SD-Card. In that case it is better to use qtVlm's dedicated folder: /Card/Android/data/org.meltemus.qtvlm/files. For each main category, there are options in qtVlm configuration screen to indicate where to locate the files.

Attention: For devices running Android 11 or more, qtVlm files are now located in: /Android/Data/org.meltemus.qtvlm/files

If you cannot access this folder via the regular Android Files Manager, it is recommended to install a stronger Files Manager, for instance **"Files"**, free and available on Google Store.

Importing files like polars, gribs etc. can be done by pressing long on the file in a File Manager, and then choose "open With' (or "Share with" in some cases), and choose qtVlm

To import charts (mbtiles, Rasters, ENCs, etc.), put them in a zip file and again open this zip file with qtVlm.

iOS

On iOS file transfers can be made in several ways.

Most file extensions are declared into iOS for qtVlm, so it is possible to open an email attachment and send it directly to qtVlm.

For users equipped with a Mac, it is also very easy to transfer gribs, polar, charts, etc. using Airdrop.

It is also possible to transfer files via iTunes. Connect your device on a PC, launch iTunes, and click on the small icon representing your device.

Search
File Edit Song View Controls Account Help
Music
Library For You Browse Radio Store
Library
Recently Added
Artists
Albums
Songs
Genres
Devices
Philippe's iPhone
Music
Movies
TV Shows
Books
Audiobooks
Tones
Music Playlists
Genius
Années 90
Les 25 plus écoutés
Meilleur classement
Morceaux récents
Musique classique
Click here
Music
Songs and videos you add to iTunes appear in your music library.
Your music purchases in iCloud will also appear whenever you're signed in to the iTunes Store.
Go to the iTunes Store
Sign in to the iTunes Store

Then click on “File sharing”:

And finally choose qtVlm as an application:

You can now drag and drop files in this folder. For instance, let's imagine you want to transfer "Visit My Harbour" charts to your iOS device. Just select them from the dongle or the DVD and drop them into iTunes:

Then you can launch qtVlm, or if it is already running launch "qtVlm->import from iTunes folder" in order to integrate these files into qtVlm. In the case of VMH charts, you will also have to activate them using qtVlm->Configuration->Charts and choose "VMH activation".

Please note that although sub directories in this folder cannot be opened directly in iTunes, you can drag and drop them on your PC, do whatever you need to do (copy, delete files), and then drag it back into iTunes.

You can also transfer files using Finder on a Mac. For this you need to open 2 Finder windows, one of them showing your connected device and the "files" tab, which should have a line for qtVlm. Then from the other finder windows you can just drop the file into qtVlm and then run "Import from iTunes folder" in qtVlm.

Exporting files on iOS, sending as an email attachment

In qtVlm there are many possibilities to export files, for instance export a route as a gpx file, or a route's log as a csv file, etc.

In Configuration->General there is an option "Automatically open exported files". When this is on, iOS will prompt you with a list a compatible apps and some actions. There is no possibility there to choose "send an email" but you can choose "Save to Files" and then from Files application open the exported document, choose "Share" and finally send an email with the exported file as an attachment.

Polars and boat's behavior parameters

Wind Polar

From the menu "*Boat->Boat settings*", you can select a polar:

To import a custom polar, you can either copy the polar file into qtVlm polar folder or use the button "import a polar".

You can also request a polar from our server (internet connection required). More than 250 polars available and growing.

Another good source for polars: http://jieter.github.io/orc-data/site/

You can apply efficiency factors (different for upwind and downwind), and specify a polar efficiency factor during night periods, and you can choose to force best wind angles values, or to let qtVlm calculate them.

Sails parameters

You can specify sails configurations for ranges of TWS/TWA. This information will be shown in various Route Module places, such as Route's logbook, Route's tooltip and Route's statistics. There is also an instrument available that will display the current optimum configuration:

Data for this is provided in the form of a sails polar, divided in two files:

The first file affects a number to each sail's configuration. Its extension must be ".saildesc".

	A	B	C	D
1	1	GV + Genois		
2	2	GV + Inter		
3	3	1ris + Inter		
4	4	2ris + Foc		
5	5	3ris + Foc		
6	6	GV + Leger		
7	7	GV + Assym		
8	8	GV + Sym		
9				

The second file (extension sailselect) defines the utilization of each sail's definition according to TWS/TWA:

	A	B	C	D	E	F	G	H
1	TWA/TWS	8	12	16	20	25	30	32
2	40	1	1	2	3	3	4	5
3	80	6	6	6	2	2	4	5
4	100	7	7	7	6	2	4	5
5	110	7	7	7	6	2	2	5
6	120	7	7	7	7	2	2	5
7	130	8	8	8	7	2	2	4
8	140	8	8	8	7	7	7	3
9	150	8	8	8	8	7	7	3
10	180	8	8	8	8	8	7	3
11								

In both cases separation is the semi-column. These files must be placed in the "polar" directory.

Note that sails changes appear in route logbook and can also be shown on the route itself.

Waves, Gusts and Ice Density parameters

Waves

Boat's behavior in waves can be defined in two ways:

- You can specify a "**Waves Polar**", that will indicate what gain or loss will be calculated depending on waves angle and height, i.e., which % to apply on the wind polar. Waves Polar can be defined for various TWS, because for instance 1m waves height has more effect in very light winds than in strong winds. Waves polars can be displayed graphically through the "boat" menu. Please see Waves polar format for a detailed explanation concerning the format of a "Wave Polar" and explanations concerning **waves steepness**.

For this calculation, qtVlm uses these data, sorted by priority:

1. Primary Waves Direction and Combined Waves Height
2. Wind Waves Direction and Wind Waves Height
3. Swell Direction and Swell Height
4. Mean Waves Direction and Combined Waves Height
5. Max Waves Direction and Max Waves Height
6. Wind Waves direction and Combined Waves Height
7. Wind direction and Combined Waves Height

- **Crossed Sea**: You can define what is crossed sea by entering a minimum height and a minimum angle between wind waves and swell. If wind waves direction is not available (as often), then wind's direction will be used instead. If such a condition is met, a coefficient will be applied on the wind polar. Grib data used are Swell Height and Direction, and Wind Waves Direction.

Gusts

In case Gusts data is present in the gribs, you may configure how Routings and Routes module should adjust the polar. In normal cases when gusts are strong compared to average wind the boat may navigate under-canvassed so the polar needs to be adjusted.

You can also increase the polar by inputting a polar efficiency over 100 %.

Note that there is also a parameter in routings to avoid places where gusts are over a value.

Ice density

The maximum ice density is used by routes and routings modules. It is the value for which the speed of the boat will fall to 0. Between 0% and this maximum, qtVlm will interpolate a speed using this formula: Boat Speed = Polar Speed * (1 – Actual Density / Maximum Density).

So for instance for a maximum density of 20%, with an actual density of 10% the boat speed will be 50% of the polar speed. For a 5% ice density it will be 25%.

Engine and penalties for Gybes and Tacks

You can specify that when the boat's speed with sails is under a value, the engine is started, with a boat's speed in that case that will override the polar value. Note that if any waves parameter is setup, the engine's speed will be affected by these parameters.

You can also specify parameters for tacking/gybbing (speed loss and duration). Units are expressed in "Cranks", which is qtVlm internal calculation step (by default 5 minutes). During that duration, route and routing will not be allowed to tack or gybe again.

Wind Polar Formats

CSV format

CSV is the most used format. You can edit it in a spreadsheet.

A	B	C	D	E	F	G	H	I	J	K	L	
TWA\TWS	0	2	4	6	8	10	12	14	16	18	20	
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0
5	0.000	0.220	0.440	0.620	0.770	0.910	0.950	0.980	1.010	1.020	1.030	1.0
10	0.000	0.440	0.890	1.250	1.530	1.810	1.880	1.950	2.000	2.030	2.050	2.0
15	0.000	0.660	1.330	1.870	2.300	2.720	2.830	2.940	3.010	3.040	3.080	3.1
20	0.000	0.890	1.780	2.500	3.060	3.620	3.760	3.910	4.000	4.050	4.100	4.1
25	0.000	1.110	2.220	3.120	3.830	4.530	4.710	4.890	5.010	5.070	5.130	5.1
30	0.000	1.330	2.660	3.750	4.590	5.430	5.650	5.870	6.010	6.080	6.150	6.1
35	0.000	1.550	3.100	4.350	5.300	6.240	6.460	6.670	6.810	6.870	6.930	6.9
40	0.000	1.750	3.540	4.990	6.090	7.140	7.210	7.350	7.430	7.490	7.560	7.5
45	0.000	2.060	4.150	5.780	6.930	8.030	8.070	8.190	8.050	8.120	8.190	8.1
50	0.000	2.210	4.450	6.150	7.250	8.290	8.380	8.550	8.670	8.740	8.810	8.7

It must start with TWA/TWS or TWA\TWS.

It is basically a simple text file, with fields separated by a semi-column. The decimal separator is the point.

boat_Class40.csv - Bloc-notes

Fichier Edition Format Affichage ?

```
TWA\TWS;0;2;4;6;8;10;12;14;16;18;20;22;24;26
00;0.000;0.00025;0.000;1.110;2.220;3.120;3.8
.810;8.790;8.840;8.790;8.630;8.280;8.110;7.9
1.290;11.360;10.250;9.150;6.870;4.580;2.290;
.580;13.560;12.740;11.910;9.380;6.850;5.070;
16.090;15.980;15.880;15.770;15.220;14.680;13
0;16.150;16.720;16.530;16.350;16.220;16.100;
;10.220;10.830;11.620;12.410;12.760;12.690;1
```

The 1st line contains wind speeds in knots. It has to be real wind TWS and not apparent wind). The 1st column contains wind angles (TWA). The table is then filled with a value in each cell that will indicate the boat's speed for that couple TWS/TWA. The steps between TWAs and TWs is free of constraints, but each cell must have a value.

POL format

It is the same as CSV format, except that the separator between field is the <tab> character.

XML format

It the format used by Maxsea. It comes as an XML file.

Waves polar format and waves steepness

Wave polar format

Waves polars must have an extension ".polwave.csv". Since it is a csv file, it can be loaded in as a spreadsheet.

	A	B	C	D	E	F	G
1	TWS=5	0	1	2	5	10	
2	0	100	90	85	80	50	
3	50	100	95	90	85	70	
4	90	100	100	95	95	90	
5	120	100	101	103	105	110	
6	180	100	102	105	110	120	
7							
8	TWS=10	0	1	2	5	10	
9	0	100	90	85	80	50	
10	50	100	95	90	85	70	
11	90	100	100	95	95	90	
12	120	100	101	103	105	110	
13	180	100	102	105	110	120	
14							

Wave Polars can be defined for various TWS. If only one TWS is defined this wave polar will be used regardless of the actual TWS.

The first cell indicates for which TWS this polar is meant to apply. Data in abscise represent Waves height in meters, and data in ordinate represent angle between waves and boat heading.

Data is the percentage to be applied in that case. In the example above, 103% of the polar speed will be used if TWS=10, Wave Height is 2 meters and angle between wave and boat is 120°.

qtVlm will interpolate any intermediate values.

Waves steepness

Wave steepness is defined by the formula "Wave Height divided by Wavelength", wave height being the vertical distance between crest and trough and wavelength being the horizontal distance between two crests.

You can choose to inject **Wave Steepness** into wave polar calculations:

For this you need to define 2 values, wave steepness reference and wave steepness low limit.

The wave steepness reference is the "normal" steepness for which the wave polar has been defined. The usual value is 3% which is the average steepness in deep waters. Note that over 14% the wave is breaking.

The steepness low limit is the value under which the wave polar will not be applied at all.

For any wave steepness over the low limit, qtVlm will interpolate (or extrapolate) a percentage (low limit being at 0% and reference being at 100%), and this percentage will be applied to the wave polar coefficient.

For instance, with limit = 1% and reference = 3%:

If the wave polar returns 85% (a penalty) and the wave steepness is 2%, qtVlm will apply only half that penalty, i.e. 92.5%.

Similarly, if wave polar returns 110% (a bonus), and wave steepness is 4%, the resulting coefficient will become 115% (more bonus).

To be able to calculate wave steepness the grib must contain wave height and wave period.

The order of priority is:

1. Combined Waves Height + Primary waves Period
2. Wind Waves Height and Wind Waves Period
3. Swell Height and Swell Period

Viewing Polar

Studying polar

This function is located under the menu "*Boat->Wind Polar analysis*".

This dialog shows critical angles for the polar (best VMGs). Note that it is possible to modify the polar outside qtVlm in the same time. Just press "Reload polar" each time you save it.

Editing polar

The polar (csv or pol) can also be edited via the menu "*Boat->Wind Polar Editor*".

	0.0	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	38.0	40.0	42.0	44.0	46.0	48.0	50.0	52.0	54.0	56.0	58.0	60.0
0.0°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.0°	0.00	0.22	0.44	0.62	0.77	0.91	0.95	0.98	1.01	1.02	1.03	1.03	1.04	1.00	0.93	0.86	0.78	0.71	0.64	0.56	0.48	0.39	0.29	0.19	0.10	0.00	0.00	0.00	0.00	0.00	0.00
10.0°	0.00	0.44	0.89	1.25	1.53	1.81	1.88	1.95	2.00	2.03	2.05	2.06	2.07	2.01	1.86	1.71	1.56	1.41	1.27	1.12	0.95	0.78	0.58	0.39	0.20	0.00	0.00	0.00	0.00	0.00	0.00
15.0°	0.00	0.66	1.33	1.87	2.30	2.72	2.83	2.94	3.01	3.04	3.08	3.10	3.11	3.01	2.79	2.57	2.35	2.13	1.90	1.68	1.42	1.17	0.88	0.58	0.29	0.00	0.00	0.00	0.00	0.00	0.00
20.0°	0.00	0.89	1.78	2.50	3.06	3.62	3.76	3.91	4.00	4.05	4.10	4.12	4.14	4.00	3.71	3.42	3.13	2.84	2.54	2.25	1.91	1.56	1.17	0.78	0.39	0.00	0.00	0.00	0.00	0.00	0.00
25.0°	0.00	1.11	2.22	3.12	3.83	4.53	4.71	4.89	5.01	5.07	5.13	5.15	5.18	5.01	4.64	4.28	3.91	3.54	3.17	2.81	2.38	1.95	1.46	0.98	0.49	0.00	0.00	0.00	0.00	0.00	0.00
30.0°	0.00	1.33	2.66	3.75	4.59	5.43	5.65	5.87	6.01	6.08	6.15	6.18	6.21	6.01	5.57	5.13	4.69	4.25	3.81	3.37	2.85	2.34	1.75	1.17	0.58	0.00	0.00	0.00	0.00	0.00	0.00
35.0°	0.00	1.55	3.10	4.35	5.30	6.24	6.46	6.67	6.81	6.87	6.93	6.94	6.95	6.78	6.42	6.06	5.70	5.34	4.97	4.61	4.00	3.40	2.55	1.70	0.85	0.00	0.00	0.00	0.00	0.00	0.00
40.0°	0.00	1.75	3.54	4.99	6.09	7.14	7.21	7.35	7.43	7.49	7.56	7.56	7.58	7.45	7.16	6.80	6.50	6.21	5.92	5.63	4.96	4.28	3.21	2.14	1.07	0.00	0.00	0.00	0.00	0.00	0.00
45.0°	0.00	2.06	4.15	5.78	6.93	8.03	8.07	8.19	8.05	8.12	8.19	8.17	8.21	8.12	7.89	7.54	7.31	7.08	6.87	6.65	5.91	5.16	3.87	2.58	1.29	0.00	0.00	0.00	0.00	0.00	0.00
50.0°	0.00	2.21	4.45	6.15	7.25	8.29	8.38	8.55	8.67	8.74	8.81	8.79	8.84	8.79	8.63	8.28	8.11	7.94	7.81	7.68	6.86	6.03	4.52	3.01	1.51	0.00	0.00	0.00	0.00	0.00	0.00
55.0°	0.00	2.36	4.77	6.52	7.57	8.55	8.69	8.91	9.05	9.14	9.22	9.19	9.25	9.27	9.25	9.02	8.91	8.81	8.75	8.70	7.81	6.91	5.18	3.45	1.73	0.00	0.00	0.00	0.00	0.00	0.00
60.0°	0.00	2.52	5.09	6.89	7.88	8.81	9.00	9.26	9.45	9.55	9.64	9.62	9.69	9.73	9.74	9.76	9.72	9.68	9.70	9.72	8.76	7.79	5.84	3.89	1.95	0.00	0.00	0.00	0.00	0.00	0.00
65.0°	0.00	2.56	5.16	7.03	8.01	8.92	9.21	9.54	9.76	9.87	9.97	9.96	10.04	10.10	10.14	10.18	10.15	10.13	10.20	10.26	9.26	8.26	6.20	4.13	2.06	0.00	0.00	0.00	0.00	0.00	0.00
70.0°	0.00	2.67	5.34	7.18	8.14	9.03	9.43	9.81	10.07	10.19	10.30	10.30	10.40	10.47	10.53	10.59	10.59	10.59	10.64	10.70	9.65	8.60	6.45	4.30	2.15	0.00	0.00	0.00	0.00	0.00	0.00
75.0°	0.00	2.73	5.47	7.28	8.24	9.13	9.61	10.08	10.38	10.51	10.65	10.78	10.90	11.00	11.08	11.16	11.19	11.21	11.29	11.36	10.25	9.15	6.87	4.58	2.29	0.00	0.00	0.00	0.00	0.00	0.00
80.0°	0.00	2.78	5.56	7.40	8.37	9.26	9.81	10.35	10.71	10.87	11.02	11.19	11.35	11.45	11.50	11.67	11.68	11.69	11.74	11.80	10.75	9.70	7.23	4.76	2.45	0.14	0.12	0.09	0.06	0.03	0.03
85.0°	0.00	2.75	5.50	7.47	8.48	9.42	10.01	10.60	10.59	11.22	11.42	11.66	11.88	12.01	12.04	12.17	12.17	12.16	12.20	12.24	11.25	10.26	7.74	5.22	3.03	0.85	0.68	0.51	0.34	0.17	0.17
90.0°	0.00	2.72	5.43	7.55	8.59	9.57	10.20	10.84	10.58	11.56	11.83	12.12	12.41	12.56	12.57	12.68	12.66	12.64	12.66	12.68	11.75	10.81	8.25	5.69	3.63	1.57	1.25	0.94	0.63	0.31	0.31
95.0°	0.00	2.68	5.37	7.62	8.70	9.72	10.40	11.08	10.56	11.91	12.23	12.59	12.94	13.11	13.11	13.18	13.15	13.12	13.12	13.12	12.24	11.36	8.76	6.16	4.22	2.28	1.82	1.37	0.92	0.46	0.46
100.0°	0.00	2.72	5.45	7.69	8.81	9.88	10.60	11.32	10.72	12.26	12.64	13.06	13.47	13.67	13.64	13.69	13.64	13.60	13.58	13.56	12.74	11.91	9.38	6.85	5.07	3.29	2.63	1.98	1.32	0.66	0.66
105.0°	0.00	2.75	5.50	7.77	8.92	10.03	10.80	11.57	10.92	12.61	13.04	13.52	14.00	14.22	14.18	14.19	14.13	14.07	14.04	14.01	13.24	12.47	10.01	7.55	5.97	4.39	3.51	2.64	1.76	0.88	0.88
110.0°	0.00	2.77	5.54	7.84	9.02	10.19	11.00	11.81	11.35	12.96	13.45	13.99	14.53	14.77	14.71	14.70	14.62	14.55	14.50	14.45	13.73	13.02	10.74	8.46	7.04	5.63	4.50	3.37	2.25	1.12	1.12
115.0°	0.00	2.84	5.68	7.91	9.13	10.34	11.19	12.05	11.78	13.30	13.85	14.46	15.06	15.32	15.25	15.20	15.11	15.03	14.96	14.89	14.23	13.57	11.61	9.64	8.37	7.09	5.67	4.26	2.84	1.42	1.42
120.0°	0.00	2.91	5.81	7.99	9.24	10.50	11.39	12.30	12.48	13.65	14.26	14.92	15.59	15.88	15.78	15.71	15.60	15.50	15.42	15.33	14.73	14.13	12.52	10.92	9.80	8.69	6.95	5.21	3.48	1.74	1.74
125.0°	0.00	2.96	5.93	8.06	9.35	10.65	11.59	12.54	13.34	14.00	14.66	15.39	16.12	16.43	16.32	16.21	16.09	15.98	15.88	15.77	15.22	14.68	13.70	12.72	11.73	10.75	8.60	6.45	4.30	2.15	2.15
130.0°	0.00	2.87	5.74	7.87	9.25	10.63	11.64	12.65	13.57	14.40	15.23	15.98	16.73	17.03	16.86	16.69	16.52	16.36	16.20	16.03	15.57	15.10	14.35	13.60	12.85	12.10	9.68	7.25	4.83	2.42	2.42

Showing polar in the main dashboard

Polar can also be displayed in the main board. If wind data is available from NMEA sources, the polar will adjust itself automatically to current TWS, allowing to compare theoretical polar speed with actual one.

Showing polar on the map

Polar can also be displayed directly on the map. For this go to the menu "View->show/hide and check the line "show/hide speed polar" (or press "Ctrl+L"). The polar will use the wind from the gribs, or the wind from instruments if NMEA is running and has TWS/TWD and the polar is centered on the boat.

Magnetic Variation

Magnetic variation is defined in the last tab of boat's settings:

Instruments will use this data is (M) mode is selected. You can either use a forced value or get the magnetic variation from NMEA message (RMC), or from WMM (World Magnetic Model).

Variation retrieved via WMM can also be shown in a route's logbook, and in the "Query grib data" dialog, at any point.

Querying magnetic data at any point/date

For any point you can access World Magnetic Model data via contextual menu (right-click or pinpoint)

Environment

General settings

From the main configuration dialog, you can choose the language, select the units for distance, the format and zone for the time and date, and many other details. You can also choose the default font and size for various elements.

OpenGL option is recommended if you intent to use course-up mode.

The Extended View switch allows qtVlm to draw in advance charts outside of the screen, which will improve panning but is rather resources intensive and will slow down a bit the rendering.

Earth radius

In "Advanced" section, you can choose between "Average" or "Celestial" Earth radius

Average uses the average radius of the WGS84 ellipsoid (6,371 nm)—it yields the more accurate values for range and bearing between distant points on the earth.

Celestial uses a spherical earth with 1′ of latitude = 1 nautical mile (6,366.707 nm)—it yields accurate intersections of circles of equal altitude centered on the geographical position of celestial bodies. It will also match traditional computations of great circle distances between distant points.

Menu

qtVlm menu consists of several sub-menus:

QtVlm Menu

This menu contains the Quit command to close qtVlm (with or without saving data). It also allows switching from VLM mode to Real mode or vice versa.

It contains the Export and Import functions, to transfer all or some data from one qtVlm installation to another (PC or mobile).

It also contains the Configuration function, with all qtVlm settings.

The license management is used to associate a device to a S63 permit, a Windows tablet license and Meltemus charts packs.

Data Exchanger

qtVlm Data Exchanger allows sharing some data with other qtVlm devices connected on the same network. Shareable data is:

- Single POI
- POIs archive
- Route
- Pathway
- Barriers set
- Archived track
- Polar
- Grib

Note that this function uses TCP and UDP port 5555, that must not be blocked by any firewall.

For Windows see for instance here https://www.hostwinds.com/tutorials/how-to-open-or-block-ports-using-windows-firewall

For MacOS see for instance here https://support.apple.com/guide/mac-help/change-firewall-settings-on-mac-mh11783/mac

For Linux see for instance here https://www.cyberciti.biz/faq/how-to-configure-firewall-with-ufw-on-ubuntu-20-04-lts/

To send something over the network, just select "Send' in qtVlm Data Exchanger menu, select something and press the "Send" button.

Please note that only one qtVlm sender can be active at a time on the network.

The IPs shown when sending are useful only if you are connected to a iOS hotspot.

To receive data, select "Receive" in Data Exchanger menu, and then press "Receive" in the receiver box.

If your network is just an iOS hotspot (Internet connection sharing) then it may be needed to indicate the sender's IP which can be found on the sender's screen. In all other cases it is not necessary to fill this field.

View menu

This menu is managing the display status of qtVlm items (POIs, traces, routes, etc.).

You can also change light mode to Night or Dusk.

max 3.9
100.0%
3.9
Knots
3.9 kts
3.9 kts
100.0
%
167° 3.9 ---- ---- 100 235° 68° 11.1 52° 13.1 167° 3.9 320° 65.1 0.0 ---- ---- ---- ---- 13°

Charts menu

This menu is dedicated to charts functions. From there you can select charts groups and ENC display category.

You can also Search for objects in ENCs charts, and open/manage various chart catalogs.

There is also a function to display your boat and trace on Google Earth.

AVURNAV manages Warning and Notices from French authorities.

The shapefile sub-menu allows you to open shapefiles coming from SHOM or from other sources.

Data menu

This menu manages gribs and other weather or maritime data. Three slots are available, where you can load gribs from different sources, containing different data or resolutions.

Various types of downloads are available. It is also possible to merge gribs, for instance to build a single grib containing Winds, Currents and Waves.

SHOM thumbnails displays tide previsions and oceanograms.

You can also ask for particles, or 3D pressure view.

Boat menu

This menu manages access to boat settings, where you can for instance specify which polar you want to use. It can also launch the "**Simulation Mode**", and you can define several types of sound alarms.

It is also from there that "Start Line mode" can be activated.

AIS targets list and AIS fleet instrument are also available from this menu.

Boat settings

This configuration screen defines various boat parameters, especially concerning wind polar, parameters depending on sea state, engine usage, etc. See Polars and boat behavior for more info on these settings.

It also allows you to set the size of the boat icon displayed on the map. A zero size will display a simple point and the name of the boat.

Two images can be defined: one to replace the default "Imoca" icon, and one that will be used at high zoom level to draw the boat in real size dimension.

The GPS antenna placement on the boat is defined, so the physical size of the boat and AIS targets can be taken into consideration when calculating CPA and TCPA (closest point of approach in AIS module), and in Start Line Mode. Draught is not used for the time being.

If dimensions are defined, qtVlm will render the boat using a shape or the image defined for that in the first tab, when the zoom level is high enough to draw 5 mm on the screen.

Icon and real boat images are always rotated with CTW, or COG if CTW is not available.

Own MMSI can be input, in which case messages coming from this MMSI will be ignored by AIS module.

You can draw one or several circles centered on the boat.

Magnetic variation can be either forced, taken from NMEA message, or taken from World Magnetic Model (WMM).

Some other options concerning the boat are also available in the main configuration screen, tab "Boat and Instruments".

Apart from various reckoning and trace options, you can specify here what Crank duration qtVlm will use. This is the internal step qtVlm is using for all calculations. A small value gives more precise results, but will be costlier in CPU, memory, and computation times.

From the boat's contextual menu, you can lock the boat's position on the screen. The boat will then stays are the same screen position and the chart will be moving. This is canceled as soon as the chart view is changed (zoom, panning, etc).

Routings menu

This menu manages routing (creation, edition, deletion). Note that unlike routes, routing are not saved when you close qtVlm, and there is no import/export functions. Routings are meant to be converted in Routes.

Routes menu

This menu manages routes: creation, deletion, edition, import, export, and comparing.

Pathways menu

This menu manages pathways, which can be used for multipoint weather routing. A pathway can also be activated. More information on that in [Pathways module]

Barriers menu

This menu manages barriers. Barriers are meant to materialize no-sail-zones or other forbidden areas. They are avoided by the routing calculations.

Marks menu

This menu manages POIs (Point of Interests). It also allows importing marks from other sources.

Help menu

This menu allows access to various help resources. It also contains the list of recent modifications in qtVlm.

Shortcuts

Alt+A	Alarms management.
Alt+B	Center map on boat.
Alt+C	Show/hide compass.
Alt+E	Show/hide labels.
Alt+F	Show/hide boats flags (VLM mode).
Alt+H	Unlock moving and resizing gauges and histograms on map.
Alt+I	Show/hide Instruments on map.
Alt+K	Close single chart.
Alt+L	Show/hide polar.
Alt+O	Show/hide opponents (VLM mode).
Alt+Q	Show/hide magnifier.
Alt+R	Create a routing.
Alt+S	Simulation mode
Alt+T	Show/hide tracks.
Alt+X	Configuration.
Alt+W	Open a weather image
Alt+Z	Keep boat's screen position when zooming.
Ctrl+B	Start a batch.
Ctrl+D	Race data (DCC)
Ctrl+E	Take a screenshot.
Ctrl+F	Open Search Vector Charts dialog
Ctrl+G	Grib display configuration.
Ctrl+H	Open/close balisage SHOM.
Ctrl+I	Gribs information.
Ctrl+K	Open a single chart.
Ctrl+L	Show/hide lights sectors on vector charts.
Ctrl+M	POIs management.
Ctrl+O	Open a grib.
Ctrl+Q	Quit qtVlm.
Ctrl+P	Add a POI
Ctrl+R	Reload POIs and routes.
Ctrl+S	Save POIs and routes.
Ctrl+V	Paste a route.
Ctrl+W	Close all gribs.
Ctrl+Alt+A	Vector Charts All display mode.
Ctrl+Alt+B	Vector Charts Base display mode.
Ctrl+Alt+C	Vector Charts Custom display mode.
Ctrl+Alt+D	Vector Charts Detailed display mode.
Ctrl+Alt+G	Show in Google Earth.
Ctrl+Alt+H	Unlock moving and resizing LCDs on map.
Ctrl+Alt+I	Information about vector or raster chart at cursor position
Ctrl+Alt+L	Show lights visible from boat (vector charts only).
Ctrl+Alt+O	Show/hide charts outlines.
Ctrl+Alt+P	Vector charts elements at cursor position

Ctrl+Alt+S	Vector Charts Standard display mode.
Ctrl+Alt+T	Show/hide main board.
Ctrl+Alt+V	Raster and Vector charts configuration.
Ctrl+Alt+W	Show Alarms history
F1	Documentation.
F5	Sync boat (VLM mode).
Ctrl F9 to F12	Store screen zoom level and position. Any single chart displayed will be saved as well.
F9 to F12	Restore screen zoom level and position and eventually redisplay the saved chart.

Also note that when moving a POI, you can press <Shift> before dropping it and it will return to its initial position.
Zooming with mouse wheel can be altered with CTRL (zoom at mouse position even if the option “keep boat position on screen while zooming” is active), SHIFT (slow zoom) and ALT (fast zoom).

Toolbar

The toolbar consists in various icons, grouped by themes.

You can choose which icons are displayed in the General settings tab (or the toolbar tab on mobile versions).

Show/hide toolbar icon

This icon will hide the toolbar, useful on small devices to recover some screen space. When the toolbar is hidden a single icon will appear on the chart to restore it

Maps and Instruments icons

These icons activate or deactivate **O**nline maps, **R**aster maps (Kaps, Geotifs, etc.), **M**btiles maps, **V**ector (S57/S63) maps and **C**M93 maps. Mbtiles icon has 3 states and can be used to **lock tiles level** at current value.

This icon materializes lights visible from the boats and is available with vector charts only. It has 3 states, lights on, lights from boat and lights off.

This icon switches the display between "North Up" and "Course Up" mode. It is recommended to activate **openGL** display in the main configuration screen if you intent to use "Course Up" mode.

The first two icons hide or show instruments on map or in panel. The third one hides or displays the main dashboard. The fourth one activates or deactivates AIS reception, the fifth one shows/hides AIS Fleet instrument, and the last one activates/deactivates VDR recording.

This icon has 3 states and switches the light mode to Day, Dusk and Night light mode.

These four icons are used for zooming the view. You can also use mouse and mouse wheel (or fingers on mobile versions) for that. Note than on **Android**, + and – buttons are replaced with volume+ and volume– physical buttons.

This icon is used to switch to selection mode. It allows selecting an area on the map, or a group of POIs for instance. The same action can be achieved with the mouse together with <shift> key (with <ctrl> key it will zoom on the selected area).

This icon activates/deactivates the magnifier.

This icon shows/hide the compass on the map. Please note that the compass can eventually rotate if the device is equipped with a magnetometer sensor. The size of the compass can be changed in the general settings. The center part of the compass is oriented according to wind direction from grib, or from real data if it is centered on the boat and these data are available.

Tides and Currents icons

These two icons allow you to show or hide tides and currents from tides (Harmonics) on the chart.

Grib icons

Press long on this icon to get a sub-menu managing various grib download commands.

This icon will open a grib in the first slot.

This icon manages grib display configuration

This icon selects which grib slot (or all) is activated.

This icon hides or shows grib data on map.

This icon allows choosing a date in the gribs.

This icon sets the grib's date to now.

These icons are used to move the grib's date forward or backward, according to the defined step.

This icon launches the grib animation.

Boat icons

These icons are used to define the unit and the length for boat's reckoning line.

This icon is used to defined or stop alarms. It appears in green if no alarm is currently triggered, and in blue if all alarms are muted.

Barriers icons

This icon can be used to place barriers on the map, that will be avoided by Routings and Routes modules.

Goto icon

This icon drops an active WP in one click on the map. You can also configure it to generate automatically a route and activate it.

Man Overboard icon

This icon creates a mark with the same symbol at boat position. This mark becomes automatically the active WP, and some information related to it (time since dropped, heading, distance) are displayed in the alarm module.

Map and main objects

POIs (points of interest) can be placed on the map with a right-click on the map (or with pinpoint icon on mobile versions). POIs can be moved with the mouse, or by capturing new coordinates in their editor.

The boat can also be moved with the mouse, or by right clicking the map and selecting "*move boat here*", if GPS reception is not activated.

You can also display a longitude/latitude grid over the map.

Status bar

It contains information from grib data at the mouse position. It can also show other information like distances, coordinates, or running imports. The font size can be specified in the main parameters.

Please note that only data actually shown on the map are displayed in the status bar (i.e. if you have for instance Currents in one grib but this data is not displayed on the map then the value of Currents at cursor position will not be displayed in the status bar.

The right side of the status bar is dedicated to active WP relative data.

Ruler tool

From all objects and directly on the map, the function "*Ruler tool*" can be called, through the contextual menu (or with the pinpoint on mobile versions).

This function shows Great Circle and Rhumb Line lines with distances, angles, etc. It will turn red or orange if crossing an obstacle or a danger. TWA data is also displayed, based on grib and instruments data.

Note that several legs can be used, by double tap or click on the screen.

Another way of getting a ruler tool is to use the function Line between POIs , or a pathway if you want to be able to move points.

Draw a grib reckoning

From all objects and directly on the map, the function "*draw a grib reckoning*" can be called, through the contextual menu (or with the pinpoint on mobile versions).

This function calculates the boat's position based on polar and grib Winds data. Five legs can be defined, either in fix TWA or fix heading mode. Penalties for tack/gybes, and waves parameters are **not** taken in account.

Reckoning

Several types of reckoning are available. The choice is made either in the main configuration dialog (boat tab), or from the boat's contextual menu (right-click). The reckoning length can be specified in number of cranks, duration or distance. Reckoning line flashes if it crosses a land.

- Reckoning based on boat's speed and heading: this is the projection of the instantaneous boat's speed and heading. No grib data is used for the calculation. This is based on COG and SOG. Please note that the boat's icon orientation is based on CTW, if available.
- Reckoning based on boat's TWA: this reckoning assumes boat's TWA will remain the same and is calculated using grib data and polar. Currents grib data is taken into consideration if present.
- Reckoning based on boat's HDG: this reckoning assumes boat's heading will remain the same and is calculated using grib data and polar. Currents grib data is taken into consideration if present.
- Cone reckoning: This will display a Cone in front of the boat, capable of detecting dangerous objects.
- Vector reckoning: This is the same as the Cone reckoning, but it displays a rectangle instead of a cone.

Please see Danger detection chapter for more details.

Internet via Iridium GO!

qtVlm can manage and handle Iridium GO! device to launch an internet connection and monitor its status.

This connection can be used for the following items:

- Direct download of grib files from xyGrib and Squid,
- Email grib requests via Saildocs,
- Download of race data positions (positions reports in DCC format),
- Download of satellite data (TLE) for Iridium satellites constellation,
- Download of weather stations,
- Download of weather images.

This is compatible on all qtVlm supported platforms.

For the connection to be active, you must be connected on Iridium WIFI network, and you need to specify Iridium GO! mode in qtVlm internet settings:

You can eventually modify Iridium parameters if you have changed default user and password and/or URL.

qtVlm will always try to use direct IP addresses when communicating through Iridium GO!. Main servers' addresses are predefined in the program, but you can update these addresses with the button "Update IPs". You must be connected to regular Internet for this action to succeed.

When an Iridium GO! download will occur, the following screen will appear:

You can press the minimize button that will show an Iridium button, green if all goes well or red if there is an issue or an error. Pressing this button will restore the normal Iridium GO! window. You can continue normal activities in qtVlm during the download.

It shows:

- the current status,
- the number of retries,
- the last error if any,
- the current task name (type of download),
- the connection status,
- the signal strength,
- battery level and battery loading status.

qtVlm will start the download when the signal strength is >= 3. Download resumes are handled.

Also note that you can check Iridium satellites elevations and bearings at your location from the main dashboard, "Satellites constellations" tab.

Licenses Management – MELTEMUS charts packs

From qtVlm menu, you can access your licenses and manage them.

There are 3 types of licenses: S63 permit, Windows Tablet license and Meltemus Charts Packs licenses.

From this screen you can for instance install or reinstall a charts pack or update it.

Charts packs are renewable directly from this screen. Expired licenses appear in red, renewed licenses will be green.

By default, you receive a notification via email whenever a charts pack needs to be updated. You can disable this notification from this screen.

Charts pack updates are also made from this screen. Just select the pack (which will be in italic if it needs to be updated) and click on "Update charts pack".

Note that this is NOT intended to manage Android or iOS full version licenses, which are handled directly by the relevant store.

Tracks Module

By default, qtVlm records your track when your boat is moving. To keep the number of points minimal, it removes useless points (aligned, too close from previous one), based on Track settings available in Configuration dialog, Boat tab:

The maximum track's length is also defined there. Width and color are chosen also in this tab. You can hide track from the View menu.

Track management is handled in boat's menu:

Tracks can be exported in KML, GPX or CSV format, depending on the extension chosen for the output file. You can also import a track if in GPX format.

Name	From	to	Length	Colour	Width	Points
track	01/01/1970 01:00	01/01/1970 01:00	0.79 m		1.3	2
vire trahilion	09/05/2020 12:11	09/05/2020 16:43	28.1 nm		2.0	21 K
hindelopen enkhuizen	04/14/2021 14:30	04/14/2021 14:38	6.1 nm		2.8	17
gister	04/16/2021 12:57	04/16/2021 12:58	73.9 m		2.8	5
3x	04/16/2021 17:12	04/16/2021 17:12	14.9 m		2.8	4
simtrack1	04/19/2021 21:25	04/19/2021 22:47	9.3 nm		2.1	18
simtrac	04/21/2021 15:40	04/21/2021 17:54	14.8 nm		2.8	15
kort	04/21/2021 17:58	04/21/2021 18:01	544 m		2.8	6
simtrack2	04/21/2021 18:01	04/21/2021 18:47	5.2 nm		2.8	4
202100424	04/23/2021 16:33	04/24/2021 19:09	15.6 nm		2.8	298
track	11/12/2021 19:04	11/14/2021 09:29	29.8 nm		1.3	14 K
track	11/12/2021 19:04	11/12/2021 19:04	0.79 m		1.3	2
track	11/12/2021 19:04	11/14/2021 09:29	29.8 nm		1.3	14 K

When starting a new track, you will be asked if you want to archive the current track.

Tracks when anchored use a high-definition scheme and store a maximum number of points.

Optionally, you can show tooltips for each track's points.

Voyage Data Recorder (VDR)

From the Boat menu, you can select "Voyage Data Recorder":

Date	Longitude	Latitude	COG	SOG	TWD	TWS	TWA	CTW	STW	PRE	DPH	XTE	Alarm	Observations	Image
mer. 11/01/2023 16:46	104°11'20"W	09°26'02"N	019.0°	6.4 kts	95.0°	10.6 kts	76.0°	018.0°	6.4 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:46	104°11'20"W	09°26'03"N	009.0°	6.4 kts	95.0°	10.6 kts	86.0°	009.0°	6.4 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:46	104°11'20"W	09°26'05"N	359.0°	6.2 kts	95.0°	10.6 kts	96.0°	358.0°	6.2 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:46	104°11'20"W	09°26'06"N	349.0°	5.9 kts	95.0°	10.6 kts	106.0°	348.0°	5.9 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:47	104°11'20"W	09°26'07"N	339.0°	5.6 kts	95.0°	10.6 kts	116.0°	338.0°	5.6 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:47	104°11'21"W	09°26'07"N	329.0°	5.2 kts	95.0°	10.6 kts	126.0°	329.0°	5.2 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:47	104°11'21"W	09°26'08"N	319.0°	4.8 kts	95.0°	10.6 kts	136.0°	318.0°	4.8 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:47	104°11'22"W	09°26'09"N	309.0°	4.6 kts	95.0°	10.6 kts	146.0°	308.0°	4.6 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:47	104°11'23"W	09°26'09"N	299.0°	4.4 kts	95.0°	10.6 kts	156.0°	298.0°	4.4 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:47	104°11'23"W	09°26'09"N	289.0°	4.3 kts	95.0°	10.6 kts	166.0°	289.0°	4.3 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:48	104°11'24"W	09°26'09"N	279.0°	4.2 kts	95.0°	10.6 kts	176.1°	278.0°	4.2 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:48	104°11'25"W	09°26'09"N	269.0°	4.2 kts	95.0°	10.6 kts	-173.9°	268.0°	4.2 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:48	104°11'25"W	09°26'09"N	259.0°	4.3 kts	95.0°	10.6 kts	-163.9°	258.0°	4.3 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:48	104°11'26"W	09°26'09"N	249.0°	4.5 kts	95.0°	10.6 kts	-154.0°	249.0°	4.5 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:48	104°11'27"W	09°26'09"N	239.0°	4.6 kts	95.0°	10.6 kts	-143.9°	238.0°	4.6 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:48	104°11'27"W	09°26'08"N	229.0°	4.9 kts	95.0°	10.6 kts	-133.9°	228.0°	4.9 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:49	104°11'28"W	09°26'08"N	219.0°	5.2 kts	95.0°	10.6 kts	-123.9°	218.0°	5.2 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:49	104°11'28"W	09°26'07"N	209.0°	5.6 kts	95.0°	10.6 kts	-114.0°	209.0°	5.6 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:49	104°11'29"W	09°26'06"N	199.0°	6.0 kts	95.1°	10.6 kts	-103.9°	198.0°	6.0 kts	N/A	N/A	N/A	None	N/A	N/A
mer. 11/01/2023 16:49	104°11'29"W	09°26'05"N	189.0°	6.3 kts	95.1°	10.6 kts	-93.9°	188.0°	6.3 kts	N/A	N/A	N/A	None	N/A	N/A

This recorder will store boat data at regular interval.

Data recorded is Position, COG, SOG, TWS, TWD, TWA, CTW, STW, PRE, XTE, RPM, GWD, GWS and Active Alarms. In addition, qtVlm will insert a POL column which contains the calculated current polar speed of your boat, for the couple TWS/TWA.

Once started, VDR will automatically run when NMEA or Simulation mode is active. On Android and iOS the recording is paused when the application is in background.

VDR can be started/stopped in one click from the toolbar.

VDR settings

Various parameters are available in the settings tab:

You can set the time interval for the recording. Minimum value is 10 seconds. Recommended value is 1 minute.

You can also add some more events that will trigger a VDR update:

- A change in COG more than n degrees,
- A tack or a Gybe,
- A new alarm event.

You can also choose to hide some columns. Data is collected even if a column is hidden.

Adding Observation and/or images to a VDR line

You can double click on a line to insert a comment or an image.

Note that images are stored as images and not as link to a file, meaning that once inside the VDR you can delete the original image file.

Date	Longitude	Latitude	COG	SOG	TWD	TWS	TWA	CTW	STW	PRE	DPH	XTE	Alarm	Observations	Image
dim. 08/01/2023 17:09	10°25'59"W	44°07'56"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:09	10°26'01"W	44°07'56"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:09	10°26'03"W	44°07'55"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:10	10°26'04"W	44°07'55"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:10	10°26'06"W	44°07'54"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:10	10°26'08"W	44°07'53"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:10	10°26'10"W	44°07'53"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:10	10°26'12"W	44°07'52"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	This is a comment	
dim. 08/01/2023 17:10	10°26'14"W	44°07'52"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:11	10°26'15"W	44°07'51"N	245.0°	8.7 kts	294.4°	25.6 kts	49.4°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:11	10°26'17"W	44°07'50"N	245.0°	8.7 kts	294.5°	25.6 kts	49.5°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:11	10°26'19"W	44°07'50"N	245.0°	8.7 kts	294.5°	25.6 kts	49.5°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:11	10°26'21"W	44°07'49"N	245.0°	8.7 kts	294.5°	25.5 kts	49.5°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:11	10°26'23"W	44°07'48"N	245.0°	8.7 kts	294.5°	25.5 kts	49.5°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:11	10°26'25"W	44°07'48"N	245.0°	8.7 kts	294.5°	25.5 kts	49.5°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:12	10°26'26"W	44°07'47"N	245.0°	8.7 kts	294.5°	25.5 kts	49.5°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:12	10°26'28"W	44°07'47"N	245.0°	8.7 kts	294.5°	25.5 kts	49.5°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:12	10°26'30"W	44°07'46"N	245.0°	8.7 kts	294.5°	25.5 kts	49.5°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A
dim. 08/01/2023 17:12	10°26'32"W	44°07'46"N	245.0°	8.7 kts	294.5°	25.5 kts	49.5°	245.0°	8.7 kts	N/A	N/A	N/A	None	N/A	N/A

VDR actions

Besides Start or Stop recording, various actions are available:

- Clear will empty the VDR completely (and even delete the file if this is not the default VDR file called "vdr.db").
- Save as allows you to create a copy of the loaded VDR
- Create a track will convert the VDR in a track that you can later find in Archived Tracks.
- Export will export the VDR in a CSV files. Images are not included.

Saved VDRs can be viewed and manipulated from the "Saved VDRs" tab.

Comparing recording data with loaded gribs

Via the third tab of the VDR dialog, you can compare either recorded wind speed or wind direction with grib data. This is useful for analyzing which grib was better during a race, for instance. Note that Ensemble and ASCAT gribs are not supported in that comparison.

Recorded wind speed will eventually be adjusted to 10 meters height, using the "Wind instruments altitude" parameter in the settings tab.

As in meteogram, you can right-click on the graph to see values for all lines or select a rectangle to zoom in (double click or press Escape to exit zoom mode).

Alarms Module

Each alarm is associated with a sound and some conditions. AIS alarms and Anchor alarms conditions are defined in their respective modules, but you can define the sound played from this dialog, for instance:

Several alarms can be defined at the same time, in which case qtVlm will generate a playlist with all the sounds. Some alarms have a delay parameter, to specify that you want the alarm to ring only if the limit is exceeded for more than that time. If the defined limit is exceeded by more than 1.5 times, the alarm will be triggered regardless of the timer.

For instance:

Regarding the alarm on distance to coasts, only the coastlines and eventually the dangers issued from vector charts that are in the area covered by the screen are taken into consideration.

Alarm on Atmospheric Pressure is available only if the relative instrument and histogram are configured in Instrument's settings.

The **Radio Communicatio**n alarm will be triggered if the boat is entering a compulsory communication area (COMARE) or will be within a configurable distance to a compulsory Radio Point (RDOCAL or NOTMRK category 37).

See Danger detection chapter for more details on this alarm.

The main tab can be used to completely stop all alarm, or to mute all sounds. Blue icon means that the alarm is not configured, green icon means that the alarm is configured but not triggered, and red icon means that the alarm is activated.

When one or several alarms are activated, a box showing which alarms are triggered is shown on the screen. By pressing on this box, sound alarms are muted **for 10 minutes**.

Note that Laylines Alarm is only triggered if the POI with laylines is the active WP.

Tides and Currents from Harmonic files

Data for Tides and Currents can be calculated from **Harmonics** files (ASCII or binary). This calculation is an estimation that do not replace real bulletins from local authorities.

To be able to display Tides and Currents from **Harmonic** files (which we do not provide), you need to define where these files are located. This is done via the Parameters dialog, "Grib and Harmonic" tab:

On **iOS or Android**, these files must be put in a zip file named "**harmonic.zip**" and send it to qtVlm via the usual way (airdrop, email, iTunes, etc.).

Since some Currents stations are collocated (with different depths), you can choose to show the Currents arrow only for the shallower station.

Once the files have been installed, you can display Tides and/or Currents via the toolbar icons or via the "Data" menu.

Please note that Currents information is just visual, routings and routes modules will not use them and need a grib with Currents data to be able to integrate Currents in their calculations.

The information displayed on the chart depends on the zoom level. At large zoom levels, the information is presented with small icons indicating that Tides or Current information exists at that location.

Once the zoom level is detailed enough, the information is presented in this form:

The date used for calculating tides and currents date is the grib date, so you can use grib date icons or slider to move it or even animate it. The date can be set before the grib's starting date or after the grib's end date.

Tides symbols (rising tide, high water, ebb tide, low water) evolve like this:

Several display options are available:

Tides and Currents objects can be queried via their contextual menu. Collocated stations can be selected from the combo box on the left.

Note that you can choose to display the station data in UTC time, local machine time, or station time zone. The yellow bar represents daylight and twilight.

Tides:

Currents:

SHOM thumbnails

This function is available from the Data menu. It will display on the chart spots where a SHOM thumbnail exists. It consists in either small or big thumbnails with tide information at that location:

For instance, here is a small thumbnail:

Note that all times (except for France) are expressed in local time zone WITHOUT summertime correction.

In France, you have also the possibility to display an oceanogram with various data:

Gribs and Weather Images

Gribs

qtVlm can use gribs from many sources, in format 1 or 2, compressed or not. Three slots are available for that, so it can manage **three gribs simultaneously**, containing different data or different resolution for the same data. If a grib contains the same data at different resolution, the data with the best resolution is used for calculations and display (if both gribs have the same resolution, the lesser grib slot number will be used. qtVlm will switch to the bigger resolution only when the data with the best resolution is exhausted in time or area. You can also force the usage of a single grib slot from the toolbar or from the grib display settings dialog.

In practice, it is usual for instance to load a grib with Winds data in the slot 1, and a grib with Currents data in slot 2, but in fact the slots are equivalent, and the order does not matter.

Gribs general options

This configuration screen is available via the menu "*qtVlm->configuration*", Grib tab.

The folder used to store downloaded gribs can be specified. Beware that by default, all gribs in qtVlm default folder will be deleted if they are older than 3 days. If another folder is specified this cleaning process will not apply.

It is also possible to filter out irrelevant data and keep only useful data used by Routes and Routings modules. This is useful to limit memory usage and therefore be able to load bigger gribs.

The first option relates to **Saildocs**, a service that can send you gribs via email. You can choose if you want to see Saildocs options screen when you generate a request, or use last settings used.

Depending on which platform you are running qtVlm, you can also generate requests via **Iridium GO!**. In this case you must indicate the relevant account information for XGate and/or Iridium Mail and Web.

You can also use directly **Iridium GO**! connection to download grib files (Saildocs or Xygrib). For this you need to activate Iridium GO! mode in qtVlm internet settings.

Check "use an external mail client" in "E-Mail and Internet" tab is you are using for instance Outlook.

You can also specify custom addresses (URLs) for downloading gribs.

You can also access directly to your **Squid** gribs subscriptions. In this case you must indicate your Great Circle account information.

Xygrib download

You can also request directly a Xygrib (OpenSkiron) download, after selecting a zone on the map. Several models are available.

Saildocs download

Select a zone on the map, then use its contextual menu to request a Saildocs grib. If the relevant option is checked in the general grib settings, you can select which kind of model, data, duration, etc. you want to request.

You can choose how the mail is going to be send, from the internet tab in qtVlm configuration dialog.

Please note that if you choose "Through qtVlm email server" the email will be sent directly without the need to open your email client application. This option is compatible with **Iridium GO!** mode.

Some explanations on the different grib models available here: grib models

Several mails can be received if several models are selected.

If the usage of an external client for email is unchecked in the options, you will need to copy/paste the body of the message and send it to query@saildocs.com, with whatever object (but not empty).

You will then receive an email with the grib as an attachment, which you can open in one of the three grib slots.

Squid gribs download and requests

If you have indicated your Squid account information, you can access directly to your Squid grib subscriptions, or generate a mail request eventually through Iridium. To get the following screen, you must select a zone and request a Squid grib via the selection contextual menu, or via the Squid grib entry available in each grib slot.

Note that you can use ctrl key to download data from several models at once (in several gribs).

This download is compatible with **Iridium GO!** mode.

Gribs opening

From the menu "*Data->Slot 1 or 2 or 3->open*" you can open a grib located on the machine. If a grib is too big to be loaded, you can select a zone on the map before opening it, that will limit the grib to this area. Gribs are automatically reloaded when the application restarts.

qtVlm knows how to read directly (and even merge) compressed files so it is not necessary to un-compress them before.

The button on the toolbar can be used to open a grib in slot 1.

Beware that qtVlm will delete all gribs in the folder used to open the grib, if they are older than 3 days. This behavior can be changed in the grib general options.

You can also open a grib in slot 1 directly from command line.

Gribs download

qtVlm can download gribs from various sources, either in slot 1, 2 or 3. You can select a zone on the screen to specify which area to download. If no zone is selected, then the portion of the map visible on screen will be used.

Full VLM grib download

VLM server provides 4 times a day a NOAA grib at a 0.5°/3h resolution, with a duration of 5 days, covering all world. If a selection is made on the map before downloading, the grib will be limited to this area although the full grib will be downloaded (35 mb).

Partial VLM grib download

It is the same as the full VLM grib, but only the selected zone (or the area visible on the screen if no zone is selected) will be downloaded. You can also do that via the contextual menu of the selection area.

Grib downloads via Iridium Mail and Web or XGate applications

qtVlm is Iridium GO! certified on Android and iOS and can generate Saildocs or Great Circle emails requests via « Iridium Mail and Web » (IMW) or XGate applications. On Windows and MacOS only XGate is supported, since IMW does not exist. On Linux these applications do not exist.

Before anything, you must select which application you will use to communicate with satellites:

Then select a zone and request a Saildocs grib via the selection contextual menu:

Be careful to not to select a too big area, and that your Saildocs parameters are set to limit grib file size to a minimum.

The mail is then generated and sent automatically to IMW or XGate. On iOS the corresponding application will be opened automatically. Your mail is ready to be send:

Similarly, the grib reception is made through IMW or XGate. On Android or iOS qtVlm will be proposed to open the attachment:

Custom grib download

You can also download in either slots a grib from a customized URL, defined in the grib options dialog.

Some useful links that can be used there:

ftp://ftp.bsh.de/Stroemungsvorhersagen/grib2 (Currents North Europ)

SKIRON gribs are also a very useful resource:

https://www.openskiron.org/gribs_wrf_4km
https://www.openskiron.org/gribs_wrf_12km
https://www.openskiron.org/gribs_skiron
https://www.openskiron.org/gribs_icon_eu
https://openskiron.org/gribs_icon-d2_latest
https://www.openskiron.org/saildocs

Grib configuration

The way grib data is displayed is managed from the menu, or with the icon in the toolbar. Arrow colors can be defined for each slot, to help comparing models together.

Currents arrows length is proportional to Currents speed.

The new rescale/reset buttons can be used for some variables to recompute the color scale for grib background based on the min/max values present in the view. Other variables will be added later.

Grib corrections

You can force wind values (TWS/TWD) and apply a correction in TWS as a percentage.

Wind values can be forced from instruments, and you can also ask for these forced values **to tend smoothly toward the grib values,** from a date and for a defined period.

Gribs information

Information about loaded gribs is available from the Data menu or CTRL+I. It displays information about which data is contained in each slot, which model (when it is possible to detect), what resolution, etc.

Comparison between grib data and actual wind

The last tab of the grib information dialog compare grib's data with actual wind coming from instruments.

It also shows a relevance factor (maximum relevance is 100), for TWD, TWS and the average. The values from grib do not take into account forced values but include eventually wind correction (see Gribs corrections).

Setting a grib date, animating the grib

These icons in the toolbar are used to position the grib at a date, to move the date forward or backward, and to launch an animation of the gribs.

You can also use the grib time slider to change the current grib's date, from the grib configuration icon and dialog.

The three lines under the days correspond to all dates in all the three gribs loaded.

Merging gribs

Via the menu "Data->merge grib files", you can concatenate gribs together (of the same type 1 or 2), to build a single grib file from many. This is useful for instance to generate a grib file containing Winds, Currents and Waves that will be easier to manipulate or transfer to a mobile device.

If the same type of data with the same date is available in several gribs, the data with the better resolution will be kept.

You can merge compressed files without decompressing them.

Meteograms

You can display a meteogram from any point or POI through contextual menu.

You can select which data is displayed using the tool button at the bottom left of the screen.

The starting date by default is the current grib date, and you can select which date range to show. Data can be exported in CSV format.

You can also ask for a grib comparison, which will show and compare TWS/TWD from each slot.

In that case possible forced wind values are ignored, but any TWS correction will be taken into consideration.

Note that it is possible to load NOAA weather stations data into the meteogram (via the contextual menu of the station).

You can zoom in the graph by selecting a rectangular area:

Press Escape or double click the graph to exit zoom mode.

You can also right-click the graph and a vertical red cursor will appear, showing the values for all lines:

Query grib data

Similarly, you can query all gribs data at any point on the chart, or through POI contextual menu

Data	Level	Slot 1	Slot 2	Slot 3
Rel humid	Above ground (2m)	N/A	91 %	90 %
Rain	Surface	N/A	0.0 mm/h	0.0 mm/h
Snow (h)	Surface	N/A	N/A	0.0 m
Cld cover	Entire atmosphere	N/A	N/A	57 %
Cld cover	Entire atmosphere	N/A	11 %	N/A
Frz rain.	Surface	N/A	no	N/A
Snow	Surface	N/A	no	N/A
CIN	Surface	N/A	-0.1 J/kg	N/A
CAPE	Surface	N/A	0.0 J/kg	0.6 J/kg
Temp	Above ground (2m)	N/A	14.7°C	15.2°C
PRMSL	Mean sea level	N/A	1,021.8 mb	1,022.6 mb
Reflectivity	Entire atmosphere	N/A	-20.0 dBZ	N/A
Theta-e	Above ground (2m)	N/A	37.0°C	37.9°C
Wind	Above ground (10m)	17.6 kts, 168.6°	15.1 kts, 164.4°	14.7 kts, 170.9°
Gusts	Above ground (10m)	N/A	19.5 kts	N/A
Gusts	Above ground (10m)	N/A	N/A	17.9 kts

Note that you can move the magnifier, zoom/un-zoom and pan, or change grib date while inside that screen.

This screen also shows magnetic variation from WMM (World Magnetic Model) at that location and at grib's date, and sunset/sunrise times for that day.

There is a second tab available which will show Sea State, i.e. a graphical representation of wave steepness, period, and height. Steepness is calculated from period and height, so this two data must be present in the grib.

The green line represents your boat's length, as indicated in boat settings.

The graph can be animated, and you can define a boat speed. Negative boat speed means against the waves (from right to left).

Note that this assumes that the observed point is in deep waters.

Grib pressure 3D view

This view can be obtained through the menu Data->3D pressure view. qtVlm will use atmospheric pressure information as elevation value.

With a mouse use left-click to get a value, and right-click + drag to move/manipulate the camera.

Grib particles

You can show grib particles from the Data menu. It is recommended to activate openGL.

Particles will be white if the grib is shown, and colored according to TWS if not:

You can tune density, speed, etc. in grib general configuration tab:

You can also ask for Currents particles:

Ensemble Gribs

Contrary to normal "deterministic" grib models like GFS that contain a value for a particular point and time, Ensemble gribs contain several values for each point.

More information at NOAA here: https://www.wpc.ncep.noaa.gov/ensembletraining/ or here https://www.ecmwf.int/en/about/media-centre/focus/2017/fact-sheet-ensemble-weather-forecasting or here https://www.ecmwf.int/en/about/media-centre/focus/2022/30-years-ensemble-forecasting-ecmwf

There are 4 main "Ensemble" model categories that qtVlm can handle:

- Ensemble models with control and members: These models (like GEFS) contain a control value and members that are results of same model running with a slightly different input or model physics. This results in several other hypotheses, 21 for GEFS, 52 for ECMWF for instance.
- Ensemble models containing a Mean value and a Standard Deviation
- Ensemble models containing a Median value and percentiles.
- Ensemble models containing blended models from various sources (NBM models for instance)

qtVlm can display this data in various forms but can also use them in routes and routing.

Values can be shown in meteograms and in Query Grib Data dialog, here are some meteograms:

qtVlm can show for instance control + mean as arrows, and a background colored with standard deviation.

Weather Images

Weather images are either non geo-referenced images (tif, png, jpg, etc), or geo-referenced images (kml or kmz or geotif files). You can find weather images in many places, for instance here: https://tgftp.nws.noaa.gov/fax/marine.shtml, or for geo-referenced images for instance here https://tgftp.nws.noaa.gov/fax/, https://ocean.weather.gov/gis/index.php or here https://earthdata.nasa.gov/earth-observation-data/near-real-time/rapid-response/modis-subsets.

David Burch blog also list many useful weather images that can be retrieved via Saildocs:

http://davidburchnavigation.blogspot.com/2020/07/us-weather-map-file-names.html

This function is helpful to compare a grib with a prevision made by a real meteorologist.

Many predefined images are available in this module.

Note that when an image file name is a link, qtVlm will automatically download the latest version of the image when you open it. This is the case for all images loaded through the "Download" button

Opening a weather image

Opening a weather image is made through the menu "*Data->Weather images->Open a weather image*".

Several images can be displayed at the same time.

To manually define a Weather image, select it and press "Edit" button

The image's file name can be an URL, in which case qtVlm will download it each time the image is shown.

That URL can contain some keywords that will be replaced by their values:

${day} for current date's day (on 2 digits)
${month} for current date's month (on 2 digits)
${year} for current date's year (on 4 digits)
${julianDate} for current date's day number in the year (on 3 digits)
${year$julianDate} for current date's year and day number in the year (on 7 digits)

In addition, you can add or subtract days, for instance ${day-4} or ${year+365}

Some not geo-referenced images are using a different projection than qtVlm. In that case the image must be reprojected into qtVlm projection

The image can also be cropped, which is useful if the image is crossing antemeridian and needs reprojection (reprojecting an image crossing the antemeridian will fail).

It is also possible to import/export predefined image configurations (qwx format).

Pre geo-referenced images download

Many images have been geo-referenced by Starpath, you can access them via the "Download" button at the end of the dialog. Image parameters are loaded into the selected item.

Several categories are available

Placing a non geo-referenced weather image on the map.

Once a file has been chosen, it is useless to capture coordinates, since it is possible to manipulate the image directly on the screen with mouse or fingers. Make sure the option "Lock image on map" is unchecked to allow that.

qtVlm also accepts URLs directly instead of a file name. In this case the image will be downloaded each time the Ok button is pressed.

Using mouse and the 4 corners, and the transparency slider at the top of the image, position the image where it belongs, with the help of coast lines for instance.

When the image has been correctly positioned and resized, choose the final opacity, and lock it back in the configuration dialog.

When this image will need to be updated, qtVlm will remember the position and size of this slot (up to 8).

Displaying KML and KMZ geo-referenced images

Similarly, you can specify images files with a kml or kmz extension (can be an url as well, in which case qtVlm will download the file each time Ok button is pressed). These files are already georeferenced, so they will be placed and re-projected on the map automatically. On Android and iOS qtVlm is registered for opening these types of file automatically.

Weather Stations and Ships Weather Reports

qtVlm can automatically load and display reports from Oceanic Weather Stations available at NOAA, Météo France, METAR, Gowind and NOAA ships reports. This is done by right-clicking somewhere on the chart and requesting Weather Stations download.

Stations reports will be downloaded in a range from the mouse position, by default 300 NM. This default can be changed in the grib configuration tab (sub tab Harmonics and Weather stations) of the main settings.

Note that in Iridium GO! mode, GOWIND stations will not be downloaded because too big (and useless since it contains only coastal stations).

NOAA and some Météo-France stations have a contextual menu to show their historical data in a meteogram (last 45 days of data).

Once loaded, the reports are available via the Stations tooltips. Grib data at the same date of the report are also included (if available), to allow for comparison between real and grib data.

Weather Stations can be removed via the menu mark->remove marks by type.

Simulation Mode

qtVlm offers a Simulation Mode allowing to simulate navigation together with real AIS targets, received via Internet. This mode can be activated with the menu "*Boat->Navigation simulation mode*".

In this mode, qtVlm sends your virtual position to Meltemus server, and receives back all AIS targets that are in a 50 miles range, plus all other qtVlm boats if any. qtVlm simulation boats will appear in blue. The boat is helmed through a virtual rudder located under the microboard, the boat's speed being calculated based on polar and gribs data. Winds, gusts and currents are taken into consideration as well as waves if Waves Parameters have been set. Night navigation parameters also apply. You can run the simulator without any gribs, motoring for instance.

Collisions with land, ENCs obstacles and AIS targets are detected, in which case the simulation stops.

It is also possible to drop the anchor if the boat is within 500 meters from a coast. Collisions with AIS targets continue to be detected even at anchor.

In boat's settings, a parameter allows for randomizing wind data from grib.

Start Line Mode

This mode is activated through "Boat" menu. It displays a chronometer with two configurable tops, "Preparation" and "Attention".

The chronometer can be move anywhere on the screen unless the option "Lock LCDs" is checked in the menu Boat->Instruments.

You must select 2 POIs to represent the start line. Please note that "Committee" POI is always considered to be on the **right side** of the line.

You can choose to materialize crossing points on the line. A red dot will show the closest point of the line, and a yellow dot will represent the crossing point of the line at current boat speed and heading. The times to reach these points will be shown in the chronometer.

Currents are taken into consideration. All time calculations are made related to the boat's bow, as defined in boat's settings.

You can also 'top" the buoy and committee positions, meaning that the current boat's bow position will be used. An offset in meters can be indicated, since obviously you cannot hit the buoy or the committee.

Note that you can also use the function Line between POIs to determine the position of a mark or object.

If you choose to display the Safe Area, you will get 2 zones on the start line. The red one represents the area where the line is reachable in time with a port tack, and the green one with a starboard tack.

The 2 zones will be continuously reducing, until the chronometer reaches zero.

Wind and Currents used for the calculations are taken from boat instruments if available. Otherwise grib data will be used, at the boat's position.

The data at the bottom of the dialog represents the time to burn, i.e. the difference between the time to the yellow point and the remaining time. If red the time is to be gained, if green the time is to be spent.

Note that you can also choose to show laylines at Committee and/or buoy.

The best side for starting will be indicated by the color of the Committee or Buoy label, which will become green in case it is favored. Some more information is available in the object's tooltip concerning favored side calculations.

Race data (DCC)

This function is accessible from the boat menu and allows for acquiring data from other boats in the same fleet, for instance a regatta. These data are in "DCC" format.

This function is compatible with **Iridium GO!** mode, available in qtVlm internet settings.

DCC files and positions reports

Normally the race committee sends only once a DCC file, containing a list of all boats with their characteristics, then sends or make available "Positions reports" on a regular basis.

The first thing to do is therefore to select a DCC file that you have placed in qtVlm "dcc" folder (or sent to the application for iOS).

You can then, depending on the case, request a direct download of the last Positions Report, or request it through as an email through Saildocs, or place yourself Positions Reports (.txt files) directly in the folder. qtVlm will incorporate them when you select the "show" button.

You can create a POI to indicate arrival or next WP. In this case qtVlm will also calculate ranking and distance to this point for each boat. Note that only POI of type **Beacon** can be used for this purpose. This POI will also be used as the target for the mass routing.

You can also ask for automatic update of the position at a time interval. Several DCCs files can be downloaded automatically (only one in Iridium GO! mode). The "Clear All" button removes automatic downloads for all DCCs.

qtVlm calculates the speed and heading between the 2 last known positions and shows it in opponent boat's tooltip and in the management dialog. It also calculates a 24h speed estimation.

Fleet management

The management dialog shows a list of all boats and allows you to show or hide boats and change trace color. It also allows you to choose which boats can be routed.

Show	Rank	Route	Status	Name	SOG	COG	Average SOG	Average COG	Previous Average SOG	Previous Average COG	~24h Average SOG	Recent VMC
	1		Racing	Triana	N/A	N/A	5.5 kts	009.8° (T)	3.8 kts	008.1° (T)	5.0 kts	5.0 kts
	1		Finish	**Pen Duick VI**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	1		Racing	Neptune	N/A	N/A	6.2 kts	010.1° (T)	3.5 kts	018.2° (T)	5.5 kts	5.5 kts
	1		Racing	Galiana WithSecure	N/A	N/A	5.5 kts	330.9° (T)	2.8 kts	338.3° (T)	4.7 kts	4.1 kts
	1		Racing	Maiden	N/A	N/A	2.7 kts	007.8° (T)	5.9 kts	021.6° (T)	3.4 kts	3.0 kts
	1		Racing	Outlaw	N/A	N/A	4.9 kts	020.9° (T)	7.8 kts	038.7° (T)	5.7 kts	5.5 kts
	1		Racing	Spirit of Helsinki	N/A	N/A	2.6 kts	007.9° (T)	5.9 kts	024.4° (T)	3.3 kts	2.9 kts
	1		Racing	Evrika	N/A	N/A	4.8 kts	009.1° (T)	7.3 kts	036.1° (T)	5.5 kts	5.3 kts
	1		Racing	L'Esprit d'Equipe	N/A	N/A	4.0 kts	002.8° (T)	6.3 kts	058.5° (T)	4.7 kts	3.7 kts
	1		Racing	White Shadow	N/A	N/A	3.5 kts	347.7° (T)	4.5 kts	040.6° (T)	3.8 kts	3.4 kts

Target Balise Route All None OK Cancel

Last Distance	Total Distance	Distance to target	Last update or Arrival	Estimated ETA (real time)	IRC Rank	IRC rating	IRC Penalty	Estimated ETA (IRC)	IRC Compensated Difference
30.8 nm	942 nm	101 nm	16/02/2024 16:00:22	17/02/2024 11:59:29	1	1.0600	0.0h	19/02/2024 13:36:39	0 sec
N/A	**N/A**	**N/A**	**14/02/2024 03:55:12**	**14/02/2024 03:55:12**	**2**	**1.2170**	**12.0h**	**21/02/2024 10:00:05**	**1 day 20 hours 23 mins 27 secs**
28.4 nm	870 nm	27.9 nm	16/02/2024 16:15:00	16/02/2024 21:20:57	3	1.1350	0.0h	21/02/2024 11:00:58	1 day 21 hours 24 mins 20 secs
22.6 nm	951 nm	240 nm	16/02/2024 16:00:22	19/02/2024 02:59:10	4	1.0760	0.0h	21/02/2024 20:48:03	2 days 7 hours 11 mins 25 secs
29.3 nm	899 nm	4.2 nm	16/02/2024 16:00:00	16/02/2024 17:24:31	5	1.1620	0.0h	22/02/2024 04:22:14	2 days 14 hours 45 mins 36 secs
62.2 nm	973 nm	282 nm	16/02/2024 16:00:01	18/02/2024 19:38:24	6	1.1250	0.0h	23/02/2024 06:58:12	3 days 17 hours 21 mins 33 secs
29.5 nm	941 nm	4.2 nm	16/02/2024 16:00:22	16/02/2024 17:26:49	7	1.1960	0.0h	23/02/2024 07:54:09	3 days 18 hours 17 mins 30 secs
58.3 nm	850 nm	485 nm	16/02/2024 16:00:23	20/02/2024 11:54:27	8	1.1000	0.0h	24/02/2024 05:47:53	4 days 16 hours 11 mins 15 secs
50.4 nm	1,005 nm	239 nm	16/02/2024 16:00:22	19/02/2024 08:45:41	9	1.1600	0.0h	25/02/2024 04:14:35	5 days 14 hours 37 mins 57 secs
36.3 nm	844 nm	400 nm	16/02/2024 16:00:22	21/02/2024 14:53:28	10	1.0950	0.0h	25/02/2024 06:51:02	5 days 17 hours 14 mins 24 secs

Target Balise Route All None OK Cancel

You can indicate a specific polar for each concurrent.

Columns order can be adjusted. You can double-click or tap to center the view on a boat. With the configuration button you can show/hide columns (click again on it to save your choices).

Boats status can be adjusted from either Racing, DSQ; DNS, DNF or Finish. If you choose Finish you will be asked for a date/time of arrival. If you want to change this date set the status back to Racing and select again Finish. An arrived boat as its line in bold.

The **VMC** column is calculated the following way:

From the last position report, find a position report in the past as close as possible to 24h ago, then calculate how much progress in distance to the target has been made, and deduce from that an average VMC speed.

This VMC speed is then used to calculate an estimated ETA for boats that are with a Racing status.

IRC calculations

IRC calculations are made if IRC rating for a boat is indicated in the DCC file (in position 10)**, a starting date for the race and a target have been indicated in the DCC screen**.

Estimated ETA (real time)	IRC Rank	IRC rating	IRC Penalty	Estimated ETA (IRC)	IRC Compensated Difference	Track Color	Skipper
17/02/2024 11:59:29	1	1.0600	0.0h	19/02/2024 13:36:39	0 sec		Jean d'Arthuys
14/02/2024 03:55:12	**2**	**1.2170**	**12.0h**	**21/02/2024 10:00:05**	**1 day 20 hours 23 mins 27 secs**		**Marie Tabarly**
16/02/2024 21:20:57	3	1.1350	0.0h	21/02/2024 11:00:58	1 day 21 hours 24 mins 20 secs		Tanneguy Raffray
19/02/2024 02:59:10	4	1.0760	0.0h	21/02/2024 20:48:03	2 days 7 hours 11 mins 25 secs		Tapio Lehtinen
16/02/2024 17:24:31	5	1.1620	0.0h	22/02/2024 04:22:14	2 days 14 hours 45 mins 36 secs		Heather Thomas
18/02/2024 19:38:24	6	1.1250	0.0h	23/02/2024 06:58:12	3 days 17 hours 21 mins 33 secs		Campbell Mackie
16/02/2024 17:26:49	7	1.1960	0.0h	23/02/2024 07:54:09	3 days 18 hours 17 mins 30 secs		Jussi Paavoseppa
20/02/2024 11:54:27	8	1.1000	0.0h	24/02/2024 05:47:53	4 days 16 hours 11 mins 15 secs		Dominique Dubois
19/02/2024 08:45:41	9	1.1600	0.0h	25/02/2024 04:14:35	5 days 14 hours 37 mins 57 secs		Lionel Regnier
21/02/2024 14:53:28	10	1.0950	0.0h	25/02/2024 06:51:02	5 days 17 hours 14 mins 24 secs		Jean-Christophe Petit

You can eventually specify a penalty (in compensated time) for each boat.

DSQ, DNS and DNF boats are excluded from the calculation.

When a "mass-routing" is created, the **routes comparator** also shows IRC compensated ETA.

Charts

Charts Configuration

These screens, available through the menu "*qtVlm->Configuration*", allows choosing which type of charts is displayed, and manages various options for each type.

The toolbar has 5 icons dedicated to maps (Online, Rasters, Mbtiles, Vectors, CM93).

On iOS, several methods are available to transfer maps:

1. You can transfer them in a zip file or individual maps via Airdrop if you have a Mac.
2. You can transfer them via iTunes share folder. Just copy the zip or the maps inside the folder and launch qtVlm, or if it is already launched just run qtVlm->import from iTunes folder.
3. You can send the maps or the zip file with an email and open the attachments with qtVlm
4. You can also export data from a qtVlm PC installation and import it on iOS, by placing the zip containing all exported data in iTunes share folder.

Gshhs and Mbtiles Charts

Mbtiles maps

These charts are files with a ".mbtiles" extension that must be copied in qtVlm (configurable) mbtiles folder. They contain tiles, that can be displayed offline without any internet connection.

Mbtiles can also be generated with tools like SASPlanet, Maperitive, Mapbox, etc.

Several folders can be used to store mbtiles charts.

It is also possible to **manage, and preview installed mbtiles**, via the menu "Charts->mbtiles catalog".

Note that toolbar's mbtiles icon has 3 states: on, locked, off. When in locked mode the current tile level is locked so you can continue zooming/un-zooming without changing the level of details. If you zoom or pan the map once while in locked mode, next click on the button will just unlock the level. Also not recommend, you can remove "Overzoom" indication on tiles if that is the case.

Visit My Harbour Charts

These charts can be acquired here: [Visit My Harbour website]

They can be installed from a dongle (Windows only), or from a DVD, or as a downloaded zip file. These files (.vmh and .hdx extensions), must be copied in one of the mbtiles dedicated folders. Activation of these charts is made through "VMH Activation" button, an unlock code will be requested.

For more information about transferring files on Android and iOS, see the chapter [File management on mobile versions].

Charts delivered on dongle do not need activation. A dongle can be used on several Windows machines. Dongles can be used only with Windows PCs.

Activation codes can be used only once and are therefore linked to a specific machine. It is not possible to use Visit My Harbour charts on a virtual machine.

Please check Visit My Harbour website for complete details about their products and licenses.

GSHHS Charts

Gshhs charts consists in coasts lines at different qualities and scales. qtVlm cannot run without them.

Several parameters are available in the settings, like showing country names, towns, borders and rivers. Land and sea color, coast lines width is configurable too. The location of the maps can be changed, for instance on Android to move them on an external memory card.

Online Charts

Online charts need an internet connection for the tiles to be downloaded. A cache system avoids downloading tiles each time they are displayed. Several kinds of this maps can be displayed.

The location of the cache together with its maximum size can be configured.

VLM tiles

VLM tiles are based on the same maps as gshhs but are coming as tiles from VLM server. Rendering is a bit faster than local gshhs, and they also have some coloration for relief.

OpenTopoMap tiles

These tiles need to have the gribs displayed on top of them, with a configurable transparency.

OpenStreetMap tiles

These tiles are available only on mobiles versions (Android and iOS). The sea is transparent and therefore the grib can be displayed "under" them.

OpenSeaMap tiles

These tiles can be displayed over any other types of maps. They contain only sea objects like buoys, lighthouses, etc.

Rasters Charts

These charts are georeferenced images, such as **kap, geotiff, geojpeg**, etc., and must be placed in qtVlm kaps folder (location can be configured in the parameters). A single raster or ENC chart can be displayed (menu "*Charts->Single chart*"), or qtVlm will automatically choose which chart to displayed, according to display zoom level and chart's compilation scale. On iOS these kinds of charts can be imported through iTunes, Airdrop, etc. Geotiff from SHOM can have their borders automatically removed.

NVCharts

NVCharts are supported only on Windows. You just need to indicate the folder containing them in the list of charts folders, by default NVCharts are installed in C:\Chartkit.

NVCharts point of interests can be loaded via the menu "Marks->Import". Several mrk files can be loaded at the same time. To access detailed information right-click on the item (or tap long). These points can be removed by calling again the import dialog and pressing cancel when asked for files names.

Vector Charts

These charts are available for free for some countries like United States or are sold by various official sites like SHOM for France. You can also purchase Meltemus Charts Packs from our site.

Like Raster's maps, they must be placed in a configured folder.

Many display options are available:

Coastlines and other dangers from vector charts can be used in all chart modes. Please see Danger detection chapter for more details.

A "Default settings" button allows you to reset the configuration to be default ones.

Highlighting objects with extra information or with date dependency

When "Highlight objects with extra information" is checked, qtVlm will highlight objects with extra information (INFORM, NINFORM, TXTDSC, NTXTD and PICREP attributes). Only objects with PICREP attribute if "Only with image" is also checked.

When "Highlight date dependent" is checked, qtVlm will draw another special symbol for object depending on dates (for instance a seasonal light), based on DATSTA, DATEND, PERSTA or PEREND attributes.

Lights

Lights can be hidden completely thought the display menu and the toolbar, and sectors can be amplified, by hovering on them:

The lighthouse icon in the toolbar has three states: Lights hidden, lights shown, and lights visible from boat:

By default, sector lights information is not printed on the chart to avoid too much cluttering. There Is an option to force the rendering of this data.

Chart Information

Through rich-click on a chart->Chart Information you can get general information about the chart:

In the list of Depth contour, the one in bold and underlined is the Safety Contour. If no safety contour has been found a default Safety Contour will be eventually chosen and will be displayed italic and underlined.

If the chart is a S63 chart, the permit's expiration date will be shown too (in red is expired, I n yellow if it expires in less than 30 days).

You can click on the scale button to see the chart at exactly it's compilation scale.

Note that depth contours values can be displayed directly on the chart.

Pick-up reports

S57 objects can be queried, through the map contextual menu:

When the vector pickup dialog is shown, a magnifier icon appears at the place you are querying. You can use this icon and move it without quitting the pickup mode, to explore the charts displayed on the screen.

By clicking on the eye icon close to class name, you can highlight the feature on the chart itself:

For French charts and if "SHOM balisage" (see here: [SHOM Open Data Shapefiles]) has been downloaded, objects images can be directly displayed from this screen.

Charts at that position

Via the contextual menu, you can choose to display the list of charts available for a given position. This is especially useful for zooming at the exact compilation scale of one of the charts available. Included charts are RNCs (if 'R' icon is on) and ENCs (if 'V' icon is on). Charts must belong to the activated group, if any.

Overzoom indicator

In case at least one chart is over zoomed (meaning at least 2x its nominal scale), an overzoom indicator will appear the top of the screen. This label has a tooltip explaining which charts are over zoomed and by how much.

In addition, you can choose to display S52 standard symbol for over scaled on the chart.

Overscaled symbol:

Objects search

You can search vector charts for a particular object. This function is available from the Charts menu (or CTRL+F).

There are 2 types of searches available:

- Displayed charts: this allows searching with very precise features and attributes values. It is limited to charts currently displayed or recently visited during this session (i.e., in memory).
- Full S57/S63 or CM93 search: this will ask you to generate a database the first time you attempt to search for that. This build can take some time depending on your machine and your installed charts. After building the databases you can only search for objects name (OBJNAM), but this is available whatever the displayed charts. You can regenerate the databases if you delete them from the main configuration dialog (charts->rasters and vectors).

If you select a zone before launching the search, then the search will be limited to this area.

S57/S63 updates analysis

When you load a single chart via Charts menu, you can study all the updates that were published for this chart, and you can load them one by one to study what has been changed.

By hitting the button "Load and review chart up to selected update", qtVlm will display the chart up to the selected update and will display specific S57 symbology for updated/added/deleted features.

Please note that if you have selected a specific object the chart will be centered on it.

3D view

From the Charts menu you can request a 3D view of your current display. This will use shapefiles data if any is loaded, or Land Elevation features (LNDELV) in your charts. Depth Areas (DEPARE) will also be used for water zones. You can also load a GEBCO (or UKHO) file with elevations and depths, in TIF format.

Use left click to show values, and right-click + drag to manipulate the camera. The slider at the top is for light intensity.

A slider allows adjusting light intensity.

S63 Charts

S63 maps are encrypted version of S57 charts sold by various provider. They guarantee that only the buyer can display them on his devices. In order to be able to purchase charts, you will need to provide the seller a way to identify you: The User Permit.

An example of web site where you can purchase those charts: Chartworld (on this website, if an hardware ID is requested, leave the field blank as it is not the one provided by qtVlm that is asked here)

In order to get a User Permit for qtVlm you can either go on our website where you will find a complete description of the process: https://www.meltemus.com/index.php/en/s63.

To associate a User Permit to a device or PC, the simplest way is to go to menu qtVlm->Licenses Management.

Alternatively, you can setup the User Permit manually in the S63 configuration screen (available at: qtVlm ➔ Configuration ➔ Charts ➔ S63).

The acquisition of a user permit consists in four steps:

- You purchase a user permit (15€ at the time of writing of this document).
- We send you back via email a user permit which you will input in qtVlm S63 parameters.
- You send us back via email the hardware id of your machine.
- And finally, we send you the Activation Key for this machine.

An activation key allows you to purchase as many charts as you want on a particular machine. A user permit can be used to generate three activation keys for 3 different machines.

To add a chart in qtVlm you will first need to copy all the files in a subfolder of S63 folder in qtVlm folder tree. In the S63 folder you will also need to put the PERMIT.TXT obtained when you have purchased the chart.

Use the second part of the configuration screen to configure the map path:

You can also store all the files received from the chart's provider in a zip file and use the "Import" button.

Once the S63 charts are configured, the S57 charts parameters defined in "Rasters and vectors" section will apply.

NOAA Charts Catalog

From the Charts menu you can show and manage NOAA charts installation and updates:

Name	Status	Active	Long name	Scale	Edition/Updates	Issue date	Information
US1AK90M	Not installed	Active	Arctic Coast	1:1,587,870	23 / 00	14/03/2024	
US1BS01M	Not installed	Active	Bering Sea Southern Part East Part	1:3,500,000	14 / 02	11/01/2023	
US1BS02M	Not installed	Active	Bering Sea Southern Part West Part	1:3,500,000	12 / 00	22/03/2024	
US1BS03M	Not installed	Active	Bering Sea Northern Part East Part	1:3,500,000	11 / 05	19/11/2020	
US1BS04M	Not installed	Active	Bering Sea Northern Part West Part	1:3,500,000	06 / 00	29/08/2018	
US1EEZ1M	Not installed	Active	West Pacific; Wake Island, Mariana Islands, Guam	1:3,000,000	09 / 00	13/06/2023	
US1EEZ2M	Not installed	Active	South Pacific; Cook Islands, Samoa Islands, Phoenix Islands	1:3,500,000	05 / 00	08/08/2018	
US1EEZ3M	Not installed	Active	American Samoa Islands and Swains Island	1:3,500,000	02 / 04	28/08/2020	
US1GC09M	Outdated	Active	Gulf of Mexico	1:2,160,000	63 / 00	20/03/2024	New edition (62=>
US1HA01M	Not installed	Active	Hawaiian Islands	1:3,121,170	24 / 00	24/10/2022	
US1HA02M	Not installed	Active	Island of Hawaii to French Frigate Shoals	1:1,650,000	16 / 00	06/03/2024	
US1PO02M	Not installed	Active	North Pacific Ocean (eastern part) Bering Sea Continuation	1:10,000,000	21 / 01	23/04/2020	
US1WC01M	Not installed	Active	North Pacific Ocean West Coast Of North America Mexican Border To Dixon Entrance	1:3,500,000	50 / 00	18/03/2024	
US1WC04M	Not installed	Active	West Coast Of North America Dixon Ent To Unimak Pass	1:3,500,000	20 / 00	22/03/2024	
US1WC07M	Not installed	Active	San Diego to Aleutian Islands and Hawaiian Islands	1:4,860,700	24 / 04	06/07/2023	

The program will first automatically download NOAA catalog. If internet is not available, you can only remove charts (installation and updates are not available).

Note that NOAA usually updates chart every Thursday mornings (EST time).

You can filter charts by district, regions, or states. Columns are sortable. Note that you can also select an area, right click on selected zone and choose NOAA catalog, in which case you can load/update charts for that area only.

Double clicking on a chart will open it in single chart view mode.

By default, NOAA charts are installed in qtVlm folder under "noaa_enc" but you can choose another folder and already installed charts will be moved. This option is not available on Android or iOS.

Charts Grouping

For mbtiles charts and Rasters/Vectors charts you can create groups of charts, which allows easy switching from one set of charts to another.

This is done via the chart folders definition:

Once defined, you can choose which group of charts is displayed via the "Charts" menu.

Danger detection

If no vector charts are installed, only GSHHS basic coastlines can be detected by qtVlm. On the contrary, you can choose to use coastlines and dangers from vector chart, in the chart's configuration screen.

Vector charts settings for danger detection

When the above option is checked, qtVlm will use the objects from the vector chart to identify dangers in routes and routings modules, in the reckoning tools, and in the ruler tool.

These objects will be used even if you are not actually displaying a Vector Chart. Therefore, with this parameter you can for instance use a Raster chart and use "underneath" a vector chart for detecting dangers. **If no vector chart exists for a particular area, no coasts nor dangers will be detected since the GSHHS coastlines are not loaded in that case.**

Note that in S57/S63 mode objects from these charts are used even if you have selected CM93 as dangers source, and in CM93 mode only objects from CM93s are used. If "Coastlines from vector charts" is unchecked then only GSHHS coastlines are used, even in Vector mode.

We distinguished between **dangers** and **obstacles**:

Dangers are objects with a sounding less or equal to Safety Contour, or buoys and beacons. **Obstacles** are objects with a sounding less or equal to Shallow Contour.

Dangers will turn Cone, COG predictor line and Ruler tool in orange, while obstacles will turn them in red. Both dangers and obstacles can trigger an alarm. Obstacles are avoided by routes and routings and going through them in Simulation mode generates a grounding.

Included objects are:

- Coastlines and Lakes contours,
- Rocks, Obstructions and Wrecks,
- Landmarks that are wind motors,
- Depth Contours and Safety Contour,
- Depth Areas at shallow depth,
- Land areas,
- Pontoons, Shoreline constructions, hulks (boats moored permanently), unsurveyed areas, floating docks, logpons, ice areas.
- Soundings.

In addition, you can configure optional objects that will belong to the **obstacles** list:

Safety Contour parameter in charts parameters is particularly important. It is used to identify Depth Contours that will be drawn with a thicker line. Please note that if there is no Contour Depth matching exactly your setting, the next Contour Depth object will be used unless the next Contour Depth object as a depth more than 67% if setting is <= 10m or 33% if > 10m. In that case a default Safety Control will be drawn. Safety contour is a danger, but not an obstacle.

Danger detection tools

The Ruler tools and all reckoning tools can detect dangers

For instance, here is Danger and Obstacle Detection by the ruler tool:

The boat's tooltip will also show a distance to closest Danger:

Reckoning tools of types "Cone" and "Vector" can be configured for angle and width from the boat parameters tab in the main configuration dialog.

The length of these tools can be modified directly from the toolbar.

Danger Detection Alarm

You can use the Cone and the Vector reckoning tools to trigger a sound alarm:

Shapefiles and SHOM Open Data

Generic Shapefiles

qtVlm can load and display generic shapefiles, which need to be configured once to display relevant data. You can open .shp files or zip or tar.gz files containing shapefiles. This is done via the menu "Charts->Shapefiles".

When you open a generic Shapefile for the first time, qtVlm chooses the first data field available as the key to display the shapes legends. For instance, in that case that is "Expiration" which obviously is not what we want.

You can change this by selecting another field, in this case a much better choice is "PROD_TYPE"

qtVlm will remember your choice next time you open the same shapefile, even if it has been updated.

If one of the fields contains an URL, you can open it by double-clicking on it:

Two links to interesting shapefiles:

https://www.weather.gov/gis/MarineZones

https://www.marineregions.org/downloads.php

Showing shapefiles in 3D

Once you have a shapefile loaded, make sure you select some elevation field. Then from the view menu select "3D Shapefiles/ENCs view" and your chart will be rendered in 3D using elevation data from your shapefile.

You can zoom, show values with left click and manipulate the camera with right-click + drag.

Using shapefiles as barriers or coastlines for routes and routings modules

Shapefiles can be used as barriers. For instance, if you do not want to use the imprecise gshhs coast lines from gshhs, you can specify in Charts configuration that you want to use coasts lines from vector charts, load a shapefile and indicate that you want to use it as a barrier. qtVlm will then stop using gshhs and will use the shapefile and eventually the vector charts if any for all coast's detection functions.

In the above example a shapefile is used instead of gshhs for detecting coasts at Lac Léman.

SHOM Open Data Shapefiles

You can also display Shapes files coming from SHOM. **These charts are French, and this part is not translated into English.**

The display of these charts is made through the Charts menu, via the shapefile command. Current Open Data from SHOM can be downloaded directly from this dialog, or from the menu:

Currently available data are seabed nature, cables, wrecks, administrative limits and toponomy. Since 5.8.9 Buoys and Lights are also available, with pictures in most cases.

Depending on the type of data selected, several options will be presented. A tooltip will be generated on the screen to display objects available data.

For instance, here is a map showing seabed nature:

Cables:

Here is the screen showing wrecks:

Nom	Avant naufrage	Après naufrage	Circonstances	Longueur	Brassiage	Lon/Lat
N/A	Cargo présumé car panneau de cale.	Epave posée droite sur le fond, orientée au 290. L= 90m; L= 27m. Epave affaissée mais non dispersée.	N/A	104.00	30.10	-1.3631459/46.0931610
LES AMIS	bateau en bois. Vieux chalutier.	2ème det : longueur 25m, les superstructures ont disparues, il ne reste que la coque, encore relativement bien conservée, échouée sur le flanc tribord. 1ère det : batiment en bois de 72m de long, orié...	batiment abandonné à saint martin de ré, puis amené dans les années 60 à l'échouage.	25.00	N/A	-1.4275996/46.2094686
N/A	Chaland.	N/A	N/A	N/A	21.00	-1.4457434/46.2659368
CHRISTINA RUEDA	Vapeur.	N/A	A coulé le 23/02/1925.	N/A	-2.50	-1.4138230/46.1691342
CHER	N/A	N/A	N/A	N/A	N/A	-1.4829976/46.3716068
GALGOI IMPARRA	Chalutier.	04/12/2002 : L'épave apparait (partie avant du chalutier et le mât de charge) lors des grandes marées. 31/08/2000 : Seule une potence de chalutage est visible par basse mer de coefficient > 100 et dépasse d'environ 1 m le zéro hydrographique. 18/11/197	A coulé le 15/11/1977.	N/A	N/A	-1.3809855/46.0647151
N/A	N/A	N/A	N/A	N/A	-4.30	-1.3866855/46.0595815
CUPIDON	Fileyeur.	N/A	A coulé le 03/06/2008 suite à un incendie dans le compartiment machine.	11.00	52.60	-1.4690579/46.2682530
N/A	N/A	N/A	N/A	N/A	-3.60	-1.3941860/46.0674150
N/A	Chaland.	Epave posée droite sur le fond, très endommagée, orientée au 065.	N/A	20.00	35.50	-1.4166017/46.1083400
N/A	N/A	N/A	N/A	N/A	-2.40	-1.3950192/46.0624148
N/A	N/A	N/A	N/A	N/A	-2.70	-1.3963526/46.0649149
VARDAAS	Vapeur.	N/A	N/A	N/A	-3.90	-1.3958526/46.0632482
PRESIDENTE-VIERA	cargo à vapeur de Montévidéo.	17-05-1997: orientation = Est/Ouest, posée droite sur le fond, le point haut est le mât de charge avant. l'épave enfouie jusqu'aux années 1987-1988,est mise à jour par le recul de la plage; plus ou moins bien balisée, elle représente un réel danger pour	S'échoue dans la nuit du 18/11/1916 sur la plage de Saint-Trojan. sous la puissance des vagues , le navire s'ouvre en deux sur son milieu et s'ensable de plusieurs mètres.	N/A	N/A	-1.2541833/45.8424833
ROULE TA BOSSE	Sloop à moteur.	N/A	A coulé sur mine.	3.50	16.80	-1.4896999/46.3005332
MAGDEBURG	Cargo.	Orientée au 140. 5ème détermination:	A été coulé le 13/08/1944 par un bombardement aérien.	N/A	3.00	-1.0292057/45.6097131
LES TROIS FRERES	Gabare.	N/A	N/A	N/A	N/A	-1.0215291/45.6033253
N/A	Chalutier	N/A	N/A	N/A	14.50	-1.0147425/45.5971984

And here is an example of the kind of data you can find:

Buoys look like this:

Size of buoys icons, showing or not lights and showing or not labels can be configured in the main configuration screen:

Fisher Island seagrass shapefiles

Thanks to **Henry L. Ferguson Museum** in United States, there is a special function for downloading and showing seagrass areas around Fisher Island.

This feature shows a tooltip on each category of seagrass and triggers an alarm when you enter in it, for instance "Anchoring prohibited" or "Speed limit is 5 kts".

NMEA Connections and Internal Sensors

This configuration screen is available via menu "*qtVlm->Configuration*" and allows configuring NMEA connections. This configuration screen consists in 3 tabs (Incoming connections, outgoing connections and other options) and 6 tabs on mobile version (Incoming, Outgoing, Sensors, WP, options).

Note that NMEA 2000 is not supported.

Using several connections simultaneously is supported.

Incoming connections

You can decide to immediately start NMEA acquisition when qtVlm is launched.

This is divided in 2 parts, local sources and network sources.

Local sources

Replaying a file

You can specify a file containing NMEA or AIS sentences as an input. The speed of the replay is a parameter from 10 to 5000 ms and you can also specify how many sentences are read and send to instruments at each iteration. When the file is completely read it restarts from the beginning.

The optional sliders allow for changing dynamically the speed of the replay, and the position in the file. If the speed slider if moved completely on the left the replay just pause.

Serial connections

If the port does not appear in the list, you can create a custom port, this is sometimes useful on MacOS or Linux.

Serial connections are not available on Android and iOS (except on Android for the special case of a dAISy).

Please note that a GPS-USB on Windows must be configured through a serial port after installation of the relevant GPS-USB driver. On Windows 10 and MacOS, it might be possible to connect to a GPS-USB directly using internal connection.

Internal GPS

"All sources" should normally be unchecked, meaning that qtVlm should not use internet-based localization systems, but only real GPS fix.

Internal GPS data can be converted into NMEA messages (position, COG and SOG), and send over NMEA outputs. qtVlm will also send RME message (position accuracy in meters). On Android and iOS this option is available only with the full version.

Network sources

TCP

You can activate a timeout on TCP connections that will trigger a reconnection if nothing has been received for 6 seconds.

You can use **B&G WebSocket** to get data from B&G H5000 processor. This is configurable only on TCP incoming network connection number 3. AIS feed cannot be retrieved though this WebSocket. qtVlm uses in priority damped values if available.

UDP

You can specify a server IP address for UDP incoming connections. This address is used only in case of Multicasting, and therefore the default value (0.0.0.0, meaning any IPV4) should be used in most cases. You can also indicate "Any", which stands for any IP addresses (IPV4 and IPV6).

Outgoing connections

The output channels are used to send current WP information to a navigation system. It can also be used to send performance data to various instruments. There is also an option for retransmitting all NMEA data on a port.

If "retransmit all" is checked, qtVlm will send all NMEA messages it receives on these ports.

NMEA filtering

You can set up filters for both incoming and outgoing NMEA messages, via the button available on each connection. Filters can be set as exclusive or rejecting.

Message to be treated by the filter must be separated by semi column. For instance, if you want to filter all AIS messages just a "!" is enough in the list of strings.

NMEA raw data

If you activate NMEA raw data window, you will be able to see all incoming and outgoing messages

Color codes are:

- White: incoming NMEA message
- Red: error message
- Yellow: AIS message
- Cyan: outgoing message
- Green: information message

Other options

An option allows setting qtVlm date to GPS date instead of machine's internal clock.

According to the official NMEA documentation, MWD message contains Ground Wind data. If the option is unchecked qtVlm will consider that MWD message contains Sea Wind data and will calculate Ground Wind.

It is possible to send grib wind data at boat's position to NMEA output via a MWV message.

If "Record NMEA data" is checked a new file containing all received data will be created each time NMEA acquisition is restarted.

You can also display a circle around the boat materializing the position precision. This is available only if you receive RME NMEA messages, typically from a Garmin GPS or if qtVlm is sending NMEA messages from iOS or Android versions.

Sending or receiving WP related information

If "Treat RMB messages (WP) is checked, qtVlm will automatically create and activate a POI when it receives a RMB message.

You can also choose which messages are sent concerning active WP (RMB, WPL, BWC, BWR, ZTG, VMC, XTE and XTR).

"B&G ws" if for sending WP data through WebSocket (note that not all B&G processors support this).

You can also send APB message (**Auto Pilot**), either in true or magnetic mode, and choose to send Heading to WP (Course to steer) or Heading to Steer (Heading compensated by currents).

Internal sensors

qtVlm can use internal sensors, typically on Android and iOS devices (full version only).

If a sensor does not exist on your machine, the corresponding line will be grayed out and disabled.

qtVlm can also convert these signals into NMEA messages and send them over the NMEA outputs. Note that you can also convert **internal GPS** data into NMEA messages (**Position, COG and SOG**) and send that to NMEA outputs. See NMEA Connections for more details.

The Heel and Pitch sensor can be configured to automatically reverse axes depending on the device orientation. "Vertical mode" allows for instance using a phone fixed on a vertical partition.

There is also a command in the menu Boat->Instruments to calibrate the sensor. This will set the current heel and pitch angles as zero. Useful for instance if your device is positioned vertically.

Sending performances data

qtVlm can send performances sentences on NMEA output port, to be displayed on NKE, Raymarine or B&G instruments. These data consist in theoretical polar speed (1), opposite track heading with the same TWA (2), target speeds for CMG and VMG (3), optimum polar angles for upwind and downwind (4), and currents direction and speed calculated by qtVlm (based on COG, SOG, CTW, STW) (5).

Data smoothing and corrections

It is possible to smooth data received for wind speed and direction, and boat speed and direction. The value indicates the number of last received data that should be averaged. As this data is used in all calculations, it allows careful tuning of the sensibility of instruments, for instance Polar Efficiency Percentage (PPC). The default value (1) means not smoothing.

qtVlm Companion

qtVlm can also pilot "**qtVlm Companion**", which is an application for Android devices and especially Android Wear devices. It can display all the data sent by qtVlm, and has several other modules like Maps, WPs, Anchor, Race Start, Alarms, etc.

See [Companion documentation]() for more details.

NMEA activation

NMEA connections are activated either with the microboard or with the main board. You can also choose to start NMEA automatically at qtVlm's startup.

The frequency at which qtVlm will update data coming from NMEA connections is configurable in the main board. Especially on Android and iOS, a too small value can have a huge impact on battery usage.

When a position has been found (fix), buttons turn green. If no position has been found yet, buttons are colored in red.

AIS Module

Apart from this documentation, you can find many details about AIS in qtVlm in David Burch blog: [AIS in qtVlm]

Configuration

Many options are available in AIS module.

The first option filters out targets based on their distance to boat.

It is also possible to filter out targets based on their types, or to display only targets belonging to your friend's list.

The 2 average SOG values are used when displaying the fleet to compute average speed for the given duration.

You can filter targets based on their class:

Options controlling CPA (Closest Point of Approach) and TCPA (time to CPA) allows configuring alarms (sound and/or visual). Real boat sizes can be used for these calculations. These calculations can be deactivated completely.

The **list of all AIS targets** can be obtained through the "display" menu. From this list, it is possible to display/hide tracks or tracking info, to add remove a target from your friend's list, or to center the map on a target. It is also possible to manage the friend's list members, even if their MMSI are not listed.

Optionally, VBO messages can be treated for instance to update your position, heading and speed.

Connecting a dAISy to an Android device USB port.

While a dAISy (AIS receiver) can easily be connected on a PC serial port, it is also possible to connect it directly on an Android device, with an USB-C cable:

To be recognized by qtVlm, you also need to activate this connection in NMEA settings:

Target details

Targets have a tooltip information, which summarizes main information concerning it. They also have a contextual menu for displaying more details, or to archive their track. Their color indicates their status (green if all details have been received, yellow otherwise), or if the target is generating a CPA alarm (red in that case). Lost targets, i.e., targets that didn't emit anything during a configurable time, are displayed in grey. They are deleted after 3 times this time.

It is also possible to search for and display this target on Marine Traffic (internet connection required).

Other options manage trace's display and reckoning.

You can also add or remove this target from the fleet list. In this case the target will appear a bit darker on the map. You can also decide to display only targets belonging to your friend's list.

You can also display additional tracking data in the target label. In that case targets will also be shown in the "AIS fleet" instrument.

AIS Fleet instrument

Through the icon in the toolbar or via the View menu, you can display the AIS Fleet instrument. AIS targets belonging to the fleet or displaying dynamic data are included.

This window behaves like an instrument and can be left opened.

%SOG is the percentage of the target's speed compared to your speed.

%SOG (fleet) is the percentage of the target's speed compared to the average speed of the fleet.

You can change the columns order.

A double click on a line will center the view on the target.

From this dialog you can also toggle between "show only fleet" and "show all AIS targets"

Alarms, CPA, TCPA

Depending on parameters, AIS module will generate sound and visual alarms. A target generating a CPA alert turns red with a flashing dot. A configurable sound is also played, see Alarms module. A sound alarm can be deactivated for a specific target, temporarily or forever.

Sound media can be different for ClassA, ClassB, MMSI presence or SART alarms.

You can also configure a list of MMSI (for instance the list of personal MOB devices), and an alarm will be generated immediately if one of these MMSI becomes active.

If the sound alarm is deactivated, the visual signal becomes blue. This allows finding which targets are still generating a sound alarm, since they are still red.

Real boat size can be taken into consideration in CPA calculations, if the distance to the boat is less than a configurable value. Your own boat size must be defined in your boat settings (menu "*Boat->Boat Settings*"). Boats are drawn in real size if the zoom level is big enough.

Please note that boat's length is equal to A + B and boat's width is equal to C + D. Draught is not used for the time being.

AIS via Internet

It is possible to display targets acquired from Internet, via our server.

*Receiving AIS targets via Internet implies that you also send back your own real AIS feed (if any) back to our server and AisHub server. Your own position or data (VDO message) is **not** sent to AisHub.*

Warning: AIS targets acquired through internet are NOT accurate, due to the delay for updating their position and status through all the servers.

To avoid overloading your system with thousands of targets, only targets **within 50 NM circle** from your position are sent. There is no distance limitation for targets representing users sharing their position.

If a target is acquired both via internet and via transducer, the target via internet is ignored. Internet targets are marked with a red dot to distinguish them from regular AIS targets.

Various options are available:

You can choose if you agree to share your position with other qtVlm boats (reals or in Simulation Mode). If you choose to share your position, you can also decide if you want to receive only real boats that are in your friends list. And finally, you can decide whether you want to see Simulation Boats and use the Virtual VHF to communicate with other qtVlm users. The Virtual VHF is in the main board, last tab.

This function can be used for instance to retrieve positions for a fleet participating in a regatta.

Inland AIS

qtVlm decodes specific Inland European information (blue flag, number of blue cones, loaded/unloaded status, and various information specific to Inland regulation).

Area Notices

qtVlm support Area notices (broadcasted). Il will show various geometry and the notice itself is displayed as a tooltip

Areas are colored in red for Distress Areas, in light red for Security Alerts, in orange for Caution areas, in green for Environmental Caution areas, in pink for Restricted Areas, in yellow for Anchorage areas, in blue for Instructions areas, in light blue for Information areas, in dark blue for Chart Feature areas, in white for Ship Report areas, in gray for Route areas, and in black otherwise.

Detailed dialog is shown with right-click on one of the shapes belonging to the Area Notice. On mobile the detailed dialog is shown by pressing more than 1 second on the area.

Weather Stations

Weather stations are shown with a dynamic wind arrow if they have data concerning wind.

Instruments

There are 2 sets of instruments: those displayed over the chart and those displayed in a dedicated separated panel. In both cases, all instruments (LCDS, dials and histograms) can be shown/hidden, moved and resized. LCDs colors can be specified individually. For instance, it's possible to have a limited number of small instruments on the map, and a larger set of bigger instruments in the panel. Both sets of instruments can be shown/hidden via the toolbar icons and .Please note that in both cases the configuration depends on the screen orientation. Note that instruments panels have 2 possible configurations.

The "lock all" button locks both sets of instruments (on chart and panel).

Instruments over charts

Instruments selection

Instruments selection is made through the menu "*qtVlm->Configuration*", instruments tab.

Each instrument is made of an **LCD** plus eventually a **dial** and eventually a **histogram**. The size of the digital displays can be adjusted in the configuration dialog, General tab. The dial is displayed/hidden by **pressing shortly** on the digital display, and the histogram by a **long press**. It is recommended to activate only histograms you really need since histograms are quite costly resources wise.

Moving and resizing instruments

To be able to move and resize instruments, you must first unlock them. This is done via the menu Boat->Instruments.

Once unlocked, instruments can be moved with the mouse or finger, and can be resized via the small icon at their bottom right:

You can also change the background and the foreground colors for LCDs, as well as their transparency.

Histograms

You can zoom on histogram's graphs. Just press on it and select the zone you want to zoom in. Double click (or tap) to exit the zoom.

That feature needs to be enabled in the configuration screen

Note that zooming on graphs is not possible if instruments are in resize/move mode.

Instruments panel

This panel displays instruments without anything else, over all other elements like charts, boat, POIs, etc.

You can change light mode to dusk or night with the icon

Instruments panel selection

Instruments selection is made via the +/- button, which is shown when the lock icon is opened. The green arrow allows you to configure two different panels.

Instruments panel moving and resizing.

When the lock icon is opened, you can move and resize instruments at your will. The procedure is the same as the instruments on the map.

The red eye in LCDs can be used to hide the LCD while keeping the dial and/or the histogram:

Other instruments parameters

Histograms abnormal values filter

In the general instruments settings, you can request to show the "filter abnormal values button".

In that case a filter button will be displayed in each histogram, which when press will remove any abnormal values (if any), based on a standard deviation formula.

Calypso instruments via Bluetooth

It is possible to connect Calypso anemometers via Bluetooth. This is done through the boat menu.

Note that it is possible to convert all incoming signals to NMEA messages and send them on NMEA outputs.

Available Instruments

COG: Course Over ground

This instrument displays Course Over Ground, plus heading/distance to WP (in blue). The background boat shape is oriented according to CTW.

SOG: Speed Over Ground

This instrument displays Speed Over Ground. The maximum speed reached is also displayed.

VMC: Velocity Made Course

This instrument shows Velocity Made Course, also called VMG toward waypoint.

XTE: Cross Track Error

This instrument shows the distance between your position and a theoretical route, in meters. An active WP or an XTE reference must have been defined, this is done through the route contextual menu. XTE reference can be deleted from the route menu. See Routes Module for more information.

TSP: Target Speed

This instrument expresses the speed (STW) in percentage of optimum speed as given by the polar to reach the WP. Optimum speed is the speed on water corresponding to the best VMC towards the WP. For instance, for a WP upwind, too much speed means you must luff up a bit, while a percentage lower than 100% means you must bear away a bit. For steering, this information is often more efficient than VMC

PPC: Polar Percent

This instrument shows the difference between actual speed and theoretical polar speed, as a percentage and as values. It is also possible to send this data through the NMEA output port in order to display it on NKE or Raymarine instruments.

TWD: True Wind Direction

This instrument shows True Wind Direction. If NMEA data do not provide it and if it is possible, qtVlm will calculate it based on COG, SOG and apparent wind data. The arrow's color changes with wind speed, and boat orientation is drawn on background.

Histogram associated with TWD consists in the deviation from the period mean value, which allows you to know if the wind is heading or lifting.

In the main instruments' configuration tab, you can also ask for "TWD distribution in TWD histogram". In that case the histogram will also show a band representing the statistical distribution of TWD (black means less occurrences, yellow means more occurrences).

What this tool provides is a view of the general trend for the wind oscillations and lets you see quickly which side of the course the wind oscillations are biasing. This can be useful in helping decide which side of the course you want to develop leverage on the fleet on.

TWA: True Wind Angle

This instrument shows True Wind Angle. If NMEA data do not provide it and if it is possible, qtVlm will calculate it based on COG, SOG and apparent wind data. The value and the arrow are green when TWA is inside the polar VMG limits, red otherwise. The digital display also shows a red or green dot, depending on the tack. The red parts on the dial represent the polar VMG limits and are recomputed dynamically.

This instruments also shows all other wind data (TWD/TWS/AWA/AWS).

If you click or tap on the upper label of the gauge, you will enter close-hauled mode (press again on the label to exit):

The angle limits of the close-hauled mode (here 0°/70°) can be configured in the Instruments settings (minimum and maximum).

TWS: True Wind Speed

This instrument displays True Wind Speed. If NMEA data do not provide it and if it is possible, qtVlm will calculate it based on COG, SOG and apparent wind data.

AWA: Apparent Wind Angle

This instrument displays Apparent Wind Angle. If NMEA data do not provide it and if it is possible, qtVlm will calculate it based on COG, SOG and real wind data.

Tack side is represented with a green or red dot over the digital display.

AWS: Apparent Wind Speed

This instrument displays Apparent Wind Speed. If NMEA data do not provide it and if it is possible, qtVlm will calculate it based on COG, SOG and real wind data.

GWS: Ground Wind Speed

This instrument displays Ground Wind Speed, which is the vector subtraction of Sea Wind (TWS/TWD) and currents.

GWD: Ground Wind Direction

This instrument shows Ground Wind Direction, which is the wind blowing on Earth as opposed to TWS/TWD which is the wind blowing on the sea.

CTW: Course Through Water

This instrument shows Course Through Water. It is different from COG in case of Currents, for instance. It also displays heading/distance toward current waypoint (in blue). The background boat shape is oriented according to COG.

STW: Speed Through Water

This instrument shows Speed Through Water. It is different from SOG in case of Currents, for instance. It also displays the maximum value measured.

HDG: Heading

This instrument shows heading as measured on a Compass. It is different from COG in case of Currents, for instance. It also displays heading/distance toward current waypoint (in blue). The background boat shape is oriented according to COG.

CNM: Course to Next Mark

This instrument shows heading toward current WP. There is no dial since this information is already displayed in CTW and COG dials.

DNM: Distance to next mark

This instrument shows the distance to active WP.

CS/CD: Currents Speed and Direction

Currents Speed and Direction are either received from NMEA input, or calculated by qtVlm from COG, SOG, CTW and STW. Please note that Currents direction indicates where the Currents goes, contrary to Winds for which direction indicates where wind come from.

The boat orientation is drawn on the background of the dial.

DPH: Depth

This instrument displays depth as received from NMEA data. This instrument has no dial, but historical data can be displayed through its histogram.

PRE: Atmospheric Pressure

This instrument displays pressure as received from NMEA data or internal sensor. This instrument has no dial, but historical data can be displayed through its histogram (up to 10 days).

The trend for the last hours (configurable is Instruments settings) is displayed.

HEEL/PCH: Heel and Pitch

This instrument shows Heel Angle, and in its dial shows also Pitch angle:

The "mast-needle" is articulated so it shows the correct heel graduation whatever the height of boat and water.

Another particularity is that it is updated as soon as a signal is received, regardless of the value set for NMEA updates frequency.

Pitch can be filtered out in Instrument's options.

ATP: Air Temperature

This instrument shows Air Temperature in °C

STP: Sea Temperature

This instrument displays Sea Temperature in °C

RPM: Rotations Per Minute

This instrument does not have an associated gauge or histogram.

RUD: Rudder angle

This instrument does not have an associated gauge or histogram.

PSP: Polar Speed

This LCD displays theoretical polar speed for the current couple TWS/TWA. It does not have an associated gauge or histogram.

T_TWA: Target TWA

This instrument displays optimal TWA for current wind speed. It does not have an associated gauge or histogram.

T_AWA: Target AWA

This instrument displays optimal AWA for current wind speed. It does not have an associated gauge or histogram.

T_TSP: Polar speed corresponding to T_TWA/TWS

This instrument displays the polar speed corresponding to the couple T_TWA/TWS. It does not have an associated gauge or histogram.

VMG: Velocity Made Good

This instrument shows VMG (to wind, as opposed to VMC which is related to activated WP).

ROT: Rotation per minute

This instrument shows the boat's rotation angle per minute.

LAT and LON: Show current boat's latitude and longitude

DTW: Distance Traveled through Water

Since last reset of the sending device or simulation mode restart.

UTC: Universal Time Controller

Shows UTC time. If time is coming from NMEA (GPS) an indication (NMEA) will be shown.

Boards

Microboards

The microboard is always located on the top-right corner of qtVlm. You can hide/show it from general settings, boat's tab, and you can also choose between VLM Microboard and Tactics Microboard: In both cases clicking in the middle will bring the main dashboard.

VLM Microboard

The long arrow represents the winds direction. The red arrow is the current active WP direction, while the pink arrow is the direction corresponding to the best VMC toward the current active WP. Green arrow is TWD (red is not in allowed polar angles, yellow if just at that limit). You can click on the upper label to center the chart on boat.

Tactical Microboard

Tactical Microboard shows much more data than VLM microboard. It can be oriented North-Up or Bow-Up and can show laylines on active WP.

Polar limits can be rotated according to TWD as in the previous images, or according to HDG:

You can also ask for a transparent background in the central part of the board: Several other options are available:

Available data in Tactical Microboard

TWD indicator will be either green or red, depending on polar limits. The rudder scale is limited to -30°/+30° and the indicator will smoothly turn red when approaching 30° rudder angle.

The start/stop NMEA button can have 4 colors:

- White: NMEA acquisition is not started
- Green: NMEA acquisition is started, and a GPS fix has been found.
- Red: NMEA acquisition is started, but no GPS fix has been found.
- Yellow: Simulation Mode is activated

Tactical Microboard on the chart or as a regular instrument

Tactical Microboard can also be used as a regular instrument on the chart or in Custom Instruments panels (under the name "MBRD"). You can decide to center this instrument automatically on the boat.

Position tab

This tab shows boat's geographical coordinates. It also allows moving the boat to a precise position by pressing "position" button. You can also reset or archive the boat's trace from here.

Button "?" can be used to export coordinates, course, and speed in Geodata format.

Clicking on the boat image will close the main dashboard.

It also shows sunset and sunrise date for the current date, and moon phase.

Speed and Heading tab

This tab shows boat's speed and heading.

WP tab

This tab shows active WP information. DNM (Distance to Next Mark) is displayed, as well as NDNM (Next Distance to Next Mark), i.e., the distance between active WP and next mark, if active WP belongs to an active route or an active pathway. It also contains information about best VMC heading.

It also shows a big LCD with the estimated remaining to active WP, based on boat speed and heading (not from grib/polar data). This is the same data as shown in the status bar.

If active WP belongs to an active route or an active pathway then some other information is displayed, related to next mark rounding. These data can be computed based on active route and grib data or based on wind data as reported by instruments. It will also show Next Sail configuration do reach that POI if you have defined a sails configuration.

Note that next TWA is red if wind is port side, and green if starboard.

You can use "Next WP" button to activate the next POI in an activated route or pathway. Reset button will just deactivate current active POI.

NMEA tab

This tab shows and commands NMEA activation.

In the constellation picture please note that square satellites are from GLONASS.

See NMEA connections documentation for more info.

Satellites constellations tab

This tab shows satellites constellation, using TLE data (Two Lines Elements). Several constellations are predefined:

TLE files can be downloaded directly from this tab. **Note that it Is recommended to update these files once a week.**

Gray satellites are inactive.

A list of satellites can also be displayed:

Name	Elevation	Azimut	Altitude	Velocity	Slant Range	Range Rate	Next Event	Visibility
IRIDIUM 7 [-]	-85.3°	083.2°	793.3 km	7.455 km/sec	13,487.8 km	0.146 km/sec	AOS 45 mins 26 secs	In Sunlight
IRIDIUM 5 [-]	-57.2°	243.5°	644.1 km	7.523 km/sec	11,446.7 km	-2.420 km/sec	AOS 3 hours 54 mins 3 secs	In Sunlight
IRIDIUM 4 [-]	-50.0°	018.8°	775.3 km	7.469 km/sec	10,766.8 km	4.124 km/sec	AOS 1 hour 7 mins 17 secs	Eclipsed
IRIDIUM 914 [-]	-44.7°	009.0°	765.0 km	7.475 km/sec	10,019.5 km	4.692 km/sec	AOS 1 hour 8 mins 2 secs	Eclipsed
IRIDIUM 16 [-]	-16.7°	003.9°	779.3 km	7.472 km/sec	5,561.6 km	6.118 km/sec	AOS 1 hour 19 mins 34 secs	In Sunlight
							AOS	

Anchor tab

This manages Anchor Alarm. Anchor is also moveable with mouse, unless specifically locked on screen.

Coordinates can also be directly captured.

Alarm will ring whenever the boat's distance to the anchor is larger than the one configured. The sound played is defined in the Alarms Module.

You can also define a forbidden sector in the circle.

An email can be sent if the option is checked. One mail will be sent when the boat exits the safe zone, and another one when it reenters it. There is a minimum interval of 5 minutes between emails.

You can also choose 'Send Position/COG/SOG" every 10 minutes, in which case an email containing this data will be send every 10 minutes if the boat is outside the safe zone.

An email can also be sent when the anchor is positioned.

Polar tab

This tab shows boat polar and display best wind angle upwind and downwind (left image).

You can also click on the drawing to study the polar and show specific values for a given TWA (right image).

If NMEA sources provide TWS, this value will be used when showing the polar in the board.

The polar diagram can also be studied via the menu "*Boat->Polar analysis*".

The polar also shows current boat speed as a yellow dot, and PPC (Polar Percentage) in the data.

Statistics

From the boat menu, you can request statistics that will show minimum/average/maximum values for different periods of time for SOG/STW/TWS and TWD (for TWD only average is calculated).

The collection of data **must be activated** in Instruments configuration tab:

	Ground Distance	SOG (min/avg/max)	STW (min/avg/max)	TWS (min/avg/max)	TWD (avg)
Last 5 min	1.2 nm	14.4/14.5/14.5	14.4/14.5/14.5	20.3/20.4/20.5	22°
Last 10 min	2.4 nm	14.3/14.4/14.5	14.3/14.4/14.5	20.0/20.3/20.5	22°
Last 15 min	3.6 nm	14.2/14.4/14.5	14.2/14.4/14.5	19.8/20.1/20.5	22°
Last 30 min	7.1 nm	13.9/14.2/14.5	13.9/14.2/14.5	18.9/19.7/20.5	22°
Last hour	13.8 nm	12.8/13.8/14.5	12.8/13.8/14.5	16.0/18.7/20.5	20°
Last 2 hours	N/A	N/A	N/A	N/A	N/A
Last 4 hours	N/A	N/A	N/A	N/A	N/A
Last 6 hours	N/A	N/A	N/A	N/A	N/A
Last 12 hours	N/A	N/A	N/A	N/A	N/A
Last 24 hours	N/A	N/A	N/A	N/A	N/A

The save button exports all collected data in CSV format. Filter button removes abnormal values based on standard deviation. If possible, AWA and AWS will be calculated from other data when exporting in CSV format.

Weather Routing Module

Introduction

qtVlm uses isochrons method to calculate routings. This method consists in calculating all possible boat positions from a point, using grib data and polar, for a given time (step), and then to re-iterate this calculation until the arrival point is reached.

To generate a routing, qtVlm uses boat's polar (eventually adjusted by a performance coefficient), and gribs data **Winds, Gusts, Currents, CAPE, Reflectivity and Waves**.

qtVlm has many functions concerning weather routing: pivot point, engine on or off, best starting date calculation (multi-routing), alteration of gribs data (what-if scenario), as well as many parameters to tune calculation precision versus calculation speed, depending of the machine.

Weather Routing creation

Creating a weather routing can be made either via a POI contextual menu, or via a right-click somewhere on the map (for mobiles versions Android and iOS via the pinpoint), or via the menu "*Routings->Create a routing*".

You can in most cases run the routing with default options. Press the OK button, and qtVlm will calculate the best route toward the selected arrival point.

Routing starting date can optionally be saved and restored from one routing to another.

Once the calculation has completed, you can convert this routing in a route, via "*Routing->Edit a routing*", or via the routing contextual menu.

If this option is checked before the calculation is launched, the conversion in route will take place immediately.

Converting a Weather Routing into a Route

If you change the default starting date of the routing, or did not start the routing from the boat, you need to select "from routing start".

Conversion process also proposes to automatically simplify/optimize the resulting route. Simplification process will remove all useless points (for instance aligned points). Simplification can be optimum (i.e. it will keep more points), or maximum (which means that the process will try harder to remove points).

At the end of simplification, an optimization phase will be proposed. The process will try to adjust POIs positions between the isochrons, to optimize the final ETA.

These two phases are by no mean compulsory, but in general it gives better result, by mixing isochrons method with other calculation algorithms.

Conversion to route may produce "red" POIs. These POIs are non simplifiable, because routing module has detected that they are important to avoid coasts or barriers.

See Routes Module for more details on routes.

Multi-points routing

A multi-points routing will follow a pathway, i.e. will route from one point to another until the end of the pathway. A pathway can optionally be closed.

A POI can belong to several pathways:

Pathway starting options are carried over to the routing (starting point and dates).

Other Weather Routing Module functions

Before running a routing, or after by editing it, several options and actions are available.

Display TWS along and between isochrons

This option allows displaying wind speed (TWS) over isochrons. You can also change the grib date and the correspond isochron will be highlighted. There is also an option to animate grib during isochrons generation (this will slow down the computation)

Coloring isochrons according to interval from grib reference date

The reliability of data in a grib depends a lot from the interval between this data date and the gribs reference date. The first 2 days of a grib are generally considered reliable (depending on models), and of course one must be extremely cautious with 16 days gribs. It is possible to color isochrons based on this interval:

In that case, isochrons color will be white if interval <= 2 days, light gray if <= 5 days, gray if <= 8 days, and dark gray if over 8 days:

Displaying alternative routes

You can request the routing to find and display alternatives to the main route. This is managed in the routing editor where you can specify a number for alternative routes and with which difference threshold (i.e. they must be completely different at least for the first half if the threshold is set to 50%).

White routes are alternatives to the main green route.

Finding the best starting date: multi-routing

It is common to search for the best starting date and time to reach a destination, based on various criteria like for instance duration, weather conditions during sailing, time with engine, number of tacks and gybes, rain, etc.

The multi-routing function allows generating several routings at fix time interval, and then to load them in a Route Comparator to compare them based on many criteria.

You can also request multi-routings by varying polar efficiency or applying corrections to wind TWS, or select several gribs and compare routes generated using these gribs.

Generated routes are then loaded in the route comparator. Data can be exported in CSV format, to be studied in spreadsheet.

Colour	Name	Start Date	ETA	Duration	Ortho distance	Sailed Distance	Avg BS	Max BS	Min BS	Avg TWS	Max TWS	Min TWS	Nb Tacks and Gybes	Beating time	Downwind time	Reaching time	Motor time
	Routing2 02 juin-18:53	02/06/2016 18:53	04/06/2016 09:08	1 d 14 h 15 m	147.79 NM	180.53 NM	4.84 kts	6.03 kts	2.71 kts	8.92 kts	13.26 kts	4.15 kts	73	1 d 9 h 15 m	0 d 5 h 0 m	0 d 0 h 0 m	0 d 0 h 0
	Routing2 02 juin-20:53	02/06/2016 20:53	04/06/2016 10:33	1 d 13 h 40 m	147.79 NM	177.04 NM	4.68 kts	6.23 kts	1.73 kts	8.48 kts	14.14 kts	3.06 kts	69	1 d 8 h 10 m	0 d 5 h 30 m	0 d 0 h 0 m	0 d 0 h 0
	Routing2 02 juin-22:53	02/06/2016 22:53	04/06/2016 11:58	1 d 13 h 5 m	147.79 NM	172.02 NM	4.40 kts	5.91 kts	0.86 kts	7.89 kts	14.58 kts	2.12 kts	57	1 d 7 h 35 m	0 d 5 h 25 m	0 d 0 h 5 m	0 d 0 h 0
	Routing2 03 juin-00:53	03/06/2016 00:53	04/06/2016 13:13	1 d 12 h 20 m	147.79 NM	170.28 NM	4.43 kts	6.10 kts	0.95 kts	7.43 kts	14.20 kts	2.19 kts	42	1 d 6 h 50 m	0 d 5 h 30 m	0 d 0 h 0 m	0 d 0 h 0
	Routing2 03 juin-02:53	03/06/2016 02:53	04/06/2016 14:58	1 d 12 h 5 m	147.79 NM	171.29 NM	4.59 kts	6.67 kts	2.10 kts	7.02 kts	13.47 kts	2.59 kts	23	1 d 3 h 40 m	0 d 8 h 25 m	0 d 0 h 0 m	0 d 0 h 0

Data provided for comparison are:

ETA, duration, sailed distance, average, maximum and minimum BS, average, maximum and minimum TWS, number of tacks and gybes, beating, upwind and downwind time, engine time, nighttime, rain, maximum CAPE, and maximum waves height.

Calculating and understanding inversed isochrons

This function calculates inversed isochrons, i.e. it starts from arrival point and date and calculates from where it could have come to be there and starts again until it reaches starting point. This calculation allows determining an envelope where regular and inversed isochrons are crossing. This envelope shows where the passage would be equivalent. A thin envelope is a clear sign that there is uncertainty in the routing because the passage found might well disappear on the next grib update.

Please note that it is not possible to calculate inversed isochrons for a routing on pathway.

On this image, envelope is regular and large enough. The routing is probably stable and reliable.

On this other image, we can see that the "socket" is not regular and has a narrowing part, highly suspect and needing careful investigations:

Isopoints

Isochrons are made of isopoints. You can display useful information at each of them, like weather conditions, ETA, distance to destination etc.

Placing and utilizing pivots points

Pivots points can be placed on isochrons, at isopoints. Their function is to force the routing to pass by this point, or even to restart from this point and continue routing using another destination. You can chain as many pivots as you want. Pivots points are inserted by pressing on the isochrons and calling their contextual menu.

« *Create a pivot point* » will simply restart the routing there, continuing toward the same arrival. « *Edit a pivot point* » allows editing the routing before, essentially to change arrival point (Edit a pivot is not possible if routing on a pathway). This function is useful to force passage points, or even to manage U-turns.

Other options and advanced options

Weather Routing Module allows you to choose automatic settings, depending on your machine resources and power. The slider automatically tunes calculation speed versus calculation precision.

If you uncheck "Automatic Parameters", you can modify manually various options.

- Isochrons parameters: you can define duration, time step and angle step. Duration can be different for the first and last 24h, where normally there are more obstacles to deal with.
- VBVMG between isochrons: qtVlm uses a formula based on VMGs to calculate route from one isopoint to another. If you uncheck this option (not recommended) qtVlm will use a Great Circle path between isopoints.
- Do not route outside screen: **qtVlm detects only visible coasts**, so if you allow it to route outside the current view it might not detect crossing coasts. In some rare cases it might be useful to deactivate this parameter.
- Avoid coasts, avoid barriers: These options can be deactivated, resulting in a much faster calculation. **Routing module uses by default GSHHS coastlines to detect land. You can choose to use vector charts or shapefiles coasts lines instead, which will be much more precise.**
- Maximum distance to Great Circle line: When this option is activated, routing will limit its search around the Great Circle line from start to arrival. This is useful to avoid finding points too far away, for instance when the grib is not very reliable.

- Circumvent angle: this option can be useful when the destination is completely obfuscated by an obstacle and the boat is too close from it for the routing to find a solution. In that case you can help it by specifying a deviation angle for the few first isochrons.

- Use multithreading: Uses all CPUs for calculations. Some machines do not support that well (XP for instance) and need to have this option deactivated.
- Forecast modifications: gribs data can be altered to follow some "what-if" conditions, like changes wind speed or shifting grib time.
- Maximum and minimum winds: You can ask routing module to avoid areas with too strong or too weak winds.
- Maximum waves height: You can ask routing module to avoid areas with waves height over a value.
- And waves steepness is more than: If this is checked, then only waves exceeding maximum height and having a steepness over the setting will be avoided. If no steepness can be calculated

because there is no wave period in the grib, then a 0% steepness will be used and the wave will not be avoided even if its height exceeds the maximum height value.

- Maximum CAPE: You can also ask routing module to avoid areas based on a maximum CAPE value.
- Maximum Gusts: You can specify a maximum value for gusts, assuming of course the grib contains such data.
- Maximum Reflectivity: You can specify a maximum value and the routing module will avoid areas with a greater value for Reflectivity.
- Auto zoom: This option asks routing module to automatically zoom on routing area. Since qtVlm do not see coasts outside view, it is sometimes necessary to adjust the zoom level with the slider or even uncheck this option and manage the zoom manually before launching the calculation.

Other parameters with impact on routing module

Grib corrections

See chapter Gribs corrections

Vacation (crank) length

This value can be modified via the menu "*qtVlm->Configuration->Boat and Instruments*". It represents the internal step qtVlm is using for routes, routings and many other functions. For normal utilization, 5 minutes is the recommended value.

Grib interpolation formula

This setting can be modified via the menu "*qtVlm->Configuration->Advanced*". Spatial only and SOL interpolation mode are intended to be used for some simulation games and should not be used in real boat mode.

Boat parameters

Most of boat's parameters have an influence on routing:

Polar efficiency upwind/downwind: Allows tuning the polar selectively.

Night efficiency: Similarly, you can specify a polar coefficient for night periods.

Best angles: Normally qtVlm calculates automatically best angles upwind and downwind based on the polar. You can override these values.

Waves and Gusts: See Waves and Gusts parameters for more explanations.

Engine: You can specify that below a sailing speed, you start the engine and indicate at which speed you navigate. In this case the routing will assume you go straight (i.e., best angles are ignored).

Tacks and Gybes: By default, qtVlm considers you can tack and gybe at no cost and at every crank (5 minutes). Of course, this is not realistic, and you should specify how long it takes to gybe and tack, plus eventually the loss of speed during these maneuvers.

Grib selector: If a unique grib slot has been selected in the grib selector, then only this grib will be used to calculate the routing and eventually the resulting route. If later you decide to select another grib or all the gribs, you can freeze the generated route before so that it won't be recalculated with the new selected grib(s).

Routing with Ensemble data

Routing can also use Ensemble data (see Ensemble Gribs chapter).

You can route on Control, Mean or Median elements. You can also create multi routings on all elements of an ensemble grib.

For instance, routing on all ensemble control + all members:

You can also decide to avoid areas where standard deviation is too high:

Routes Module

Introduction

Routes are lines connecting points, called POIs in qtVlm (Points of Interest). They can be created by hand or may come from a routing converted into a route or be imported from other system in various format.

Routes use gribs data to calculate a way between POIs, taking boat polar into consideration as well as navigation mode defined at POI level. Calculation step (crank or vacation) is defined in "*qtVlm->Configuration->Advanced*", with a default value of 5 minutes.

By default, POIs in a route are reached in their alphabetical order. That can be changed to use a sequence number instead.

Three navigation modes exist to navigate toward a POI:

- VBVMG mode: This mode consists in navigating in Great Circle mode toward the POI, unless the polar indicates that not inside its VMG winds limits. If the polar indicates that the TWA is not within the VMG wind limits, the route will automatically start to tack or gybe to reach the WP.
- VMG mode: This mode uses the best VMG to WP (VMC) to navigate toward POI.
- GC mode: This mode uses Great Circle route to reach the POI, even if it implies to be too much upwind or downwind.

These navigation modes are selectable from POI contextual menu, or through POI editor.

Creating or editing a route

Creating a route is done via the menu "*Routes->Create a route*", or if the route already exists edition is done via the menu "*Routes->Edit a route*", or via its contextual menu.

Several options are available, including most important starting point and starting date. You can also choose to show or not intermediate POIs, or to detect collision with land and barriers. You can alter grib data from grib and play with polar efficiency individually for this route.

You can choose to hide the route if the display as scale bigger than scale minimum.

If the route has been created manually, then you need to assign manually some POIs to it. This is made through the edition of POI, or via their contextual menu.

Converting a routing into a route

At the end of a routing calculation, it is possible to convert it into a route (see Weather Routing Module documentation).

Some POIs will appear in red. These POI are non-simplifiable points, generated by routing, and that cannot be removed or moved because they are useful to avoid coats or barriers.

It is always needed to manage these points by hand (move or remove or add new), mainly because coasts lines used by qtVlm are not precise enough.

Coasts or barriers collisions

If the relevant option is checked, route will detect if it crosses a coastline or a barrier. If this is the case, that part of the route will turn red.

Simplification, Optimization and Complexification

A route can be **simplified** and/or **optimized**. Simplification has two modes: optimum and maximum. Optimum mode will keep more points and will get better ETA, while maximum mode will keep only the strictly necessary points and remove all others. These functions can be called either from the route editor or from the route contextual menu.

Please note that routing's quality setting has also an impact on these processes. To achieve the best quality for Simplification or Optimization this auto setting should be deactivated or set to the maximum quality. Maximum quality implies longer calculations.

These processes try to avoid coasts or barriers. Beware only visible coasts (i.e. displayed on the screen) are taken into consideration. The quality of the coastlines depends on the zoom level, so it is possible that a route avoiding coast at a certain zoom level will touch them at a closer level. By default, qtVlm uses not very accurate GSHHS coasts lines, but you can choose to use vector charts coastlines instead.

If an area is selected on the map, only the part of the route inside that area will be simplified/optimized.

You can also decide to **complexify** a route. In that case a new POI will be inserted between each existing POI, and an optimization procedure will be initialized.

Add/remove POIs to route

You can add or remove POIs from a route through its editor, or via its contextual menu.

A POI can also be added where you want by right clicking the route and selecting "New POI". A POI will be inserted on the route at the mouse (or finger) position.

Append POIs

You can append new POIs to the route just by clicking or touching the screen. Since in this mode it is not possible to move the chart with a mouse pan, note that you can always use up/down/right/left keys or the corresponding buttons in the toolbar to pan the view.

Moving POIs belonging to a route

POIs belonging to a route are moved the same way as normal POIs. You should first click or tap on the poi then release it, and after a short time a blue circle appears on the POI, the POI becomes moveable and can be moved with mouse or finger. This is to avoid moving POIs accidentally, but you can choose to ignore this security in the general configuration screen.

Displaying Wind Arrows on POIs

It is also possible to display icons next to POIs, representing the wind at the time of passage. The icons also show if it will be during day or night. Their size can be adjusted in the routes general options.

Show sails changes on the route

You can show sails changes along the route as colored diamonds. The option is available in the route edition and in the various contextual menus. The default settings for new routes can be set in the general configuration, Routes tab. The size of the diamonds can be tuned in the main configuration General tab.

Boat position extrapolation

A big dot appears on the route when the grib date is moved forward. This corresponds to the position of the boat at that date. It can also be seen when animating gribs.

This also allows comparing boat's position on several routes.

The route's tooltip displays all weather information available at passage time. If configures the best sail's configuration is also displayed in the tooltip.

The yellow information is the wind data corrected with the difference between actual measured wind from instruments and grib wind at current boat position.

Route logbook

The route's logbook is available in the editor screen. It contains many information, that can be exported in CSV format. The button can be used to configure which columns are displayed or hidden.

Route | Route logbook | Histograms | Statistics

Export (CSV format) ☐ With raw data ○ HDG deviation 0° ◉ Interval 5 min

	TWS	TWD	TWA	SAILS	STW	CTW (T)	SOG	COG (T)	AWS	AWA	CS	CD	GUSTS	RAIN	CLOUDS	AIRTEMP
30/04/2019 15:00	6.60 kts	169.95°	140.00°	GV + Sym	7.43 kts	29.95°	7.43 kts	29.95°	4.86 kts	-60.82°	N/A	N/A	8.22 kts	N/A	N/A	N/A
30/04/2019 15:05	6.56 kts	170.50°	140.00°	GV + Sym	7.40 kts	30.50°	7.40 kts	30.50°	4.84 kts	-60.64°	N/A	N/A	8.15 kts	N/A	N/A	N/A
30/04/2019 15:10	6.50 kts	171.15°	140.00°	GV + Sym	7.36 kts	31.15°	7.36 kts	31.15°	4.81 kts	-60.42°	N/A	N/A	8.07 kts	N/A	N/A	N/A
30/04/2019 15:15	6.45 kts	171.82°	140.00°	GV + Sym	7.31 kts	31.82°	7.31 kts	31.82°	4.78 kts	-60.20°	N/A	N/A	7.99 kts	N/A	N/A	N/A
30/04/2019 15:20	6.39 kts	172.50°	140.00°	GV + Sym	7.27 kts	32.50°	7.27 kts	32.50°	4.75 kts	-59.97°	N/A	N/A	7.91 kts	N/A	N/A	N/A
30/04/2019 15:25	6.33 kts	173.19°	140.00°	GV + Sym	7.23 kts	313.19°	7.23 kts	313.19°	4.71 kts	59.73°	N/A	N/A	7.82 kts	N/A	N/A	N/A
30/04/2019 15:30	6.27 kts	173.64°	140.00°	GV + Sym	7.18 kts	313.64°	7.18 kts	313.64°	4.68 kts	59.44°	N/A	N/A	7.72 kts	N/A	N/A	N/A
30/04/2019 15:35	6.20 kts	174.08°	140.00°	GV + Sym	7.13 kts	314.08°	7.13 kts	314.08°	4.64 kts	59.15°	N/A	N/A	7.63 kts	N/A	N/A	N/A
30/04/2019 15:40	6.13 kts	174.53°	140.00°	GV + Sym	7.08 kts	314.53°	7.08 kts	314.53°	4.60 kts	58.86°	N/A	N/A	7.53 kts	N/A	N/A	N/A
30/04/2019 15:45	6.06 kts	174.98°	140.00°	GV + Sym	7.03 kts	34.98°	7.03 kts	34.98°	4.57 kts	-58.57°	N/A	N/A	7.45 kts	N/A	N/A	N/A
30/04/2019 15:50	6.01 kts	175.62°	140.00°	GV + Sym	6.98 kts	315.62°	6.98 kts	315.62°	4.54 kts	58.31°	N/A	N/A	7.36 kts	N/A	N/A	N/A
30/04/2019 15:55	5.94 kts	175.92°	139.90°	GV + Sym	6.93 kts	315.82°	6.93 kts	315.82°	4.51 kts	58.05°	N/A	N/A	7.27 kts	N/A	N/A	N/A
30/04/2019 16:00	5.88 kts	176.22°	139.90°	GV + Sym	6.87 kts	36.32°	6.87 kts	36.32°	4.47 kts	-57.93°	N/A	N/A	7.19 kts	N/A	N/A	N/A
30/04/2019 16:05	5.82 kts	176.76°	139.80°	GV + Sym	6.82 kts	316.56°	6.82 kts	316.56°	4.44 kts	57.69°	N/A	N/A	7.10 kts	N/A	N/A	N/A
30/04/2019 16:10	5.76 kts	177.05°	139.80°	GV + Sym	6.76 kts	316.85°	6.76 kts	316.85°	4.40 kts	57.57°	N/A	N/A	7.01 kts	N/A	N/A	N/A
30/04/2019 16:15	5.69 kts	177.35°	139.60°	GV + Sym	6.72 kts	37.75°	6.72 kts	37.75°	4.39 kts	-57.19°	N/A	N/A	6.93 kts	N/A	N/A	N/A
30/04/2019 16:20	5.63 kts	177.89°	139.50°	GV + Sym	6.66 kts	317.39°	6.66 kts	317.39°	4.37 kts	56.94°	N/A	N/A	6.84 kts	N/A	N/A	N/A
30/04/2019 16:25	5.57 kts	178.18°	139.50°	GV + Sym	6.60 kts	317.68°	6.60 kts	317.68°	4.32 kts	56.82°	N/A	N/A	6.76 kts	N/A	N/A	N/A

Warning: Winds information at route level includes wind generated by Currents, if this data is available in gribs. Consequently, wind data in route's log might differ from pure wind grib data.

It is also possible to export this in a CSV file, to be treated in a spreadsheet calculator.

The last tab "Statistics" contains the following statistical data about the route:

Great circle distance	214.18 NM	Distance travelled	277.32 NM
SOG (min/moy/max)	2.70 / 6.97 / 8.89 kts	TWS (min/avg/max)	2.22 / 9.64 / 14.13 kts
TWD (avg)	319°	CAPE (avg/max)	
Currents (min/avg/max)		Waves (max)	
Navigation time	1 days 15h 30min	Engine	
Night	0 days 19h 20min (48.9%)	Rain	
Tacks/Gybes	77 / 48	Beating	1 days 4h 25min (71.9%)
Downwind	0 days 10h 44min (27.2%)	Reaching	0 days 0h 20min (0.8%)
Sails changes	4	Sails most used	GV + Genois (72.0%)

You can show which coefficients have been applied on Polar Speed by hovering STW field with the mouse.

Histograms

Route's weather data can be displayed as histograms:

Defining an XTE reference

A route can be set as XTE (Cross Track Error) reference. This is done through the route's contextual menu.

Once an XTE reference is defined, a small dashed line will appear that represents the track that was planned. The distance to this line is shown in the XTE instrument, and the position where the boat should be on this track is also shown.

Routes comparator

Via menu "*Routes->Routes comparator*", you can compare routes based on many criteria.

Colour	Name	Start Date	ETA	Duration	Ortho distance	Sailed Distance	Avg BS	Max BS	Min BS	Avg TWS	Max TWS	Min TWS	Nb Tacks and Gybes	Beating time	Downwind time	Reaching time	Motor time
	Routing2 02 juin-18:53	02/06/2016 18:53	04/06/2016 09:08	1 d 14 h 15 m	147.79 NM	180.53 NM	4.84 kts	6.03 kts	2.71 kts	8.92 kts	13.26 kts	4.15 kts	73	1 d 9 h 15 m	0 d 5 h 0 m	0 d 0 h 0 m	0 d 0 h 0
	Routing2 02 juin-20:53	02/06/2016 20:53	04/06/2016 10:33	1 d 13 h 40 m	147.79 NM	177.04 NM	4.68 kts	6.23 kts	1.73 kts	8.48 kts	14.14 kts	3.06 kts	69	1 d 8 h 10 m	0 d 5 h 30 m	0 d 0 h 0 m	0 d 0 h 0
	Routing2 02 juin-22:53	02/06/2016 22:53	04/06/2016 11:58	1 d 13 h 5 m	147.79 NM	172.02 NM	4.40 kts	5.91 kts	0.86 kts	7.89 kts	14.58 kts	2.12 kts	57	1 d 7 h 35 m	0 d 5 h 25 m	0 d 0 h 5 m	0 d 0 h 0
	Routing2 03 juin-00:53	03/06/2016 00:53	04/06/2016 13:13	1 d 12 h 20 m	147.79 NM	170.28 NM	4.43 kts	6.10 kts	0.95 kts	7.43 kts	14.20 kts	2.19 kts	42	1 d 6 h 50 m	0 d 5 h 30 m	0 d 0 h 0 m	0 d 0 h 0
	Routing2 03 juin-02:53	03/06/2016 02:53	04/06/2016 14:58	1 d 12 h 5 m	147.79 NM	171.29 NM	4.59 kts	6.67 kts	2.10 kts	7.02 kts	13.47 kts	2.59 kts	23	1 d 3 h 40 m	0 d 8 h 25 m	0 d 0 h 0 m	0 d 0 h 0

Exporting and importing routes

Routes can be imported and exported in a variety of format, kml and gpx being the most common ones.

Imported routes are automatically frozen to keep their original data concerning ETA. You can uncheck this option later in the route's editor.

On **iOS** exported routes are place in iTunes shared folder, and the name of the file is always qtVlmRoute (.gpx, .kml, etc.). A route to be imported should also be placed there, **and its name cannot be qtVlmRoute**.

General parameters and custom fields

General configuration screen has a Route tab, which allows you to define most default values for routes.

Route Custom Fields

You can define up to three custom fields for routes. These values will be evaluated at each route's step, and will be visible in route's logbook, route's statistics, and route's tooltip. They are calculated based on a formula defined by the user, which is in fact a Javascript code. It can use the following variables:

ETA (current timestamp), **LON/LAT** (boat's Longitude/Latitude), **CTW** (Course through Water), **STW** (Speed through Water), **COG** (Course over Ground), **SOG** (Speed over Ground), **TWD** (True Wind Direction), **TWS** (True Wind Direction), **TWA** (True Wind Angle), **AWS** (Apparent Wind Speed), **AWA** (Apparent Wind Angle), **CS** (Currents Speed), **CD** (Currents Direction), **DNM** (Distance to Next Mark), **CNM** (Course to Next Mark), **ENG** (engine on), **Gust** (Gust Speed), **DAYL** (Day Light), **CLOUD** (% of cloud cover), **AIRT** (Air Temperature), **PREC** (precipitations), **Cape** (Cape), **WMH** (Max Waves Height), **WMD** (Max Waves Direction), **WCH** (Combined Waves Direction), **LDIS** (Distance travelled during this step), **PLON/PLAT** (Longitude/Latitude of active POI), **ICE** (ice density).

In addition, it is possible to use a polar file to generate a value based (interpolated) on couple (TWS, TWA). If this option is activated, then the variable name will be **CPOL**.

PERM_1, PERM_2, and **PERM_3** are "permanent" variables which you can use to store values from previous steps.

The 3 fields need a name, a short name, units and eventually a way to accumulate them ("Sum", "Average", "Integration" or "Last Value"). The short name is used in the formula.

It is possible to calculate many things that way. For instance, let's imagine you want to calculate current produced by a wind turbine:

```
var myAWS = AWS * 0.514444; //knots to m/s
if(AWS > 30.0)
      myAWS = 20.0 * 0.514444;
var S = 1.0; // surface
var rendement = 0.2; // rendement
var P = 0.0;
if(AWS > 6.0 && AWS < 40.0)
      P = 0.37 * rendement * S * Math.pow(myAWS, 3); //puissance instan-
tanée
P = P / 12.0 // Ampere
AMP = P;
```

The first field is a bit special: it can also carry its history, defined as a Java array. For instance, if your first field is called "MFIELD", you have access to its previous value through the array "PREV_MFIELD". Let's imagine you want to count the number to tacks and gybes. You need to define 2 fields, let's call them LTWA and VIRS, then a script that will look like this:

```
LTWA = TWA;
var pTWA = 0.0;
var nb = PREV_LTWA.length;
if (nb > 0)
      pTWA = PREV_LTWA[nb - 1];
VIRS = 0.0;
if (pTWA * TWA < 0)
      VIRS = 1.0;
```

By defining accumulation of "VIRS" to be "by total", you will get the number to tacks/gybes.

The same result can be achieved more efficiently by using one of the "permanent" variables:

```
VIRS = 0.0;
if(PERM_1 * TWA < 0)
      VIRS = 1.0;
PERM_1 = TWA
```

You can also define functions, use while/for loops etc. For instance, a function:

function myPow3(i){return Math.pow(i, 3);}

Values calculated like that are shown in route's logbook, route's statistics and route's tooltip.

POI	DNM	CNM	Lon target POI	Lat target POI	Ampères
POI	262.56 NM	307.22°	11°05'20"W	50°03'15"N	0.90A
POI	262.11 NM	307.22°	11°05'20"W	50°03'15"N	0.90A
POI	261.67 NM	307.21°	11°05'20"W	50°03'15"N	0.88A
POI	261.23 NM	307.21°	11°05'20"W	50°03'15"N	0.86A
POI	260.79 NM	307.20°	11°05'20"W	50°03'15"N	0.83A
POI	260.35 NM	307.19°	11°05'20"W	50°03'15"N	0.80A
POI	259.91 NM	307.19°	11°05'20"W	50°03'15"N	0.78A
POI	259.48 NM	307.18°	11°05'20"W	50°03'15"N	0.75A
POI	259.05 NM	307.18°	11°05'20"W	50°03'15"N	0.72A
POI	258.62 NM	307.17°	11°05'20"W	50°03'15"N	0.69A
POI	258.20 NM	307.16°	11°05'20"W	50°03'15"N	0.65A
POI	257.78 NM	307.16°	11°05'20"W	50°03'15"N	0.60A
POI	257.37 NM	307.15°	11°05'20"W	50°03'15"N	0.54A
POI	256.97 NM	307.14°	11°05'20"W	50°03'15"N	0.49A
POI	256.56 NM	307.14°	11°05'20"W	50°03'15"N	0.44A
POI	256.17 NM	307.13°	11°05'20"W	50°03'15"N	0.40A
POI	255.78 NM	307.13°	11°05'20"W	50°03'15"N	0.35A
POI	255.41 NM	307.12°	11°05'20"W	50°03'15"N	0.31A

Pathways module

A pathway is a list of POIs that represents for instance marks to be reached in order.

You can choose to hide a pathway when the view is zoomed over a limit.

The pathway editor dialog contains an Information and Management tab containing data about the pathway and its legs:

	From	to	Bearing (M)	Distance	Speed	Time	ETA	COG (M)	TWA	Sail
1	myBoat	POI_010	056.8°	365.9 m	2.0 kts	5 mins 56 secs	15 août-09:57	N/A	N/A	N/A
2	POI_010	POI_020	328.8°	127.9 m	5.0 kts	50 secs	15 août-09:58	N/A	N/A	N/A
3	POI_020	POI_030	266.0°	113.0 m	3.0 kts	1 min 13 secs	15 août-09:59	N/A	N/A	N/A
4	POI_030	POI_040	184.1°	73.79 m	4.0 kts	36 secs	15 août-10:00	N/A	N/A	N/A

From there you can add, suppress, and change POIs order (assuming order is set to "By Sequence", which is the default. You can also specify a speed for each leg.

Pathways can be exported or imported via the Pathways menu. You can insert or append POIs via its contextual menu, and you can also close and/or revert a pathway.

A POI can belong several times to the same pathway, and/or can belong to several pathways.

Note that when appending POIs to a pathway, you can still pan the chart with up/down/right/left keys or the corresponding buttons in the toolbar.

COG, TWA and Sail columns are the values for sailing from this POI to the next POI. COG may differ from Bearing if for instance the next POI is completely upwind, depending of course on your polar.

When data is live, you can show an instrument-like reduced view showing just the dynamic data

	From	to	Bearing (M)	Distance	Speed	Time	ETA	COG (M)	TWA	Sail
1	myBoat	POI_010	052.1°	180.9 m	7.3 kts	45 secs	15 août-10:05	052.1°	81.0°	GV + Leger
2	POI_010	POI_020	328.8°	127.9 m	7.5 kts	33 secs	15 août-10:06	286.2°	45.0°	GV + Genois
3	POI_020	POI_030	266.0°	113.0 m	7.5 kts	29 secs	15 août-10:06	266.0°	65.2°	GV + Genois
4	POI_030	POI_040	184.1°	73.79 m	7.5 kts	19 secs	15 août-10:07	191.2°	140.0°	GV + Sym

	From	to	Bearing (M)	Distance	Speed	Time	ETA	COG (M)	TWA	Sail
1	myBoat	POI_020	319.2°	80.58 m	6.7 kts	8 secs	15 août-10:05	278.0°	45.0°	GV + Genois
2	POI_020	POI_030	266.0°	113.0 m	6.7 kts	33 secs	15 août-10:06	266.0°	57.1°	GV + Genois
3	POI_030	POI_040	184.1°	73.79 m	6.7 kts	21 secs	15 août-10:06	184.1°	138.9°	GV + Sym

Routing on a Pathway

A pathway can be used to generate a routing, in which case the routing (and eventually the resulting route) will reach each point in order.

Using a Pathway as a measuring tool

The pathway will display a lot of information in its tooltip, plus information labels are generated while moving POIs belonging to a pathway. Useful for measuring distances and angles:

Note that through the pathway contextual menu you can make the pathway movable.

Activating a Pathway

Like a route, a pathway can be activated. The first POI will become the active WP, and qtVlm will automatically switch to the next POI when the boat is entering the arrival radius of the POI. You can force the next POI activation from the pathway's contextual menu:

Contrary to routes which calculate ETAs based on boat's polar and grib data, pathways compute ETAs based on actual boat speed, or based on speed that have been input in the Information and management tab. It is therefore convenient when motoring.

First POI ETA is based on VMC, and next POIs ETAs are calculated using boat's speed.

POIs tooltips show ETA in date form instead of time-to-go.

If a POI belongs several times to a pathway, only its next arrival date is displayed. To know its other dates of passage, you can edit the pathway and show Information:

	From	to	Heading (T)	Distance	Time	ETA
1	maitai	POI_0100	245.0°	27.1 nm	2 hours 42 mins 46 secs	juil. 23-23:38
2	POI_0100	POI_090	186.9°	31.9 nm	5 hours 53 mins 54 secs	juil. 24-02:49
3	POI_090	POI_080	068.3°	51.1 nm	11 hours 0 min 23 secs	juil. 24-07:55
4	POI_080	POI_070	184.7°	25.7 nm	13 hours 34 mins 21 secs	juil. 24-10:29
5	POI_070	POI_060	215.3°	31.9 nm	16 hours 45 mins 57 secs	juil. 24-13:41
6	POI_060	POI_050	271.5°	72.3 nm	23 hours 59 mins 44 secs	juil. 24-20:55
7	POI_050	POI_02000000	355.0°	116 nm	1 day 11 hours 38 mins 42 secs	juil. 25-08:34
8	POI_02000000	POI_04000000	221.4°	127 nm	2 days 0 hour 18 mins 56 secs	juil. 25-21:14
9	POI_04000000	POI_0300	354.1°	80.2 nm	2 days 8 hours 19 mins 55 secs	juil. 26-05:15
10	POI_0300	POI_02000000	078.9°	91.2 nm	2 days 17 hours 27 mins 24 secs	juil. 26-14:22
11	POI_02000000	POI_0100	131.8°	77.7 nm	3 days 1 hour 13 mins 39 secs	juil. 26-22:08

Please note that activated pathways also activate XTE calculations.

Security shape

You can request a security shape around the pathway.

Max distance is the distance qtVlm will check from the pathway for dangers (orange) or obstacles (red). It will try to shrink the safe path until it reaches the Min distance, declaring it red (grounding alert).

POIs and Barriers

POIs (Points of Interests)

Introduction

POIs are points (Points of Interest) placed on the map. They can belong to a route or a pathway, be used as starting or arrival points for a routing, be declared as active WP, etc.

POI creation and edition

POI editor is called via its contextual menu.

Coordinates can be input in both formats.

There are 3 types of POIs: classical, Mark or Beacon. The only difference being their color on the map.

It is possible to copy/paste a POI, or to center the chart on the POI.

Creating a POI can also be done via right-click menu somewhere on the map (or with the pinpoint for mobile versions).

Moving a POI can be done with mouse or finger. On PC versions, if you press SHIFT before releasing the POI, it will come back to its initial position.

You can also input a comment (512 characters max) and attach an image that will be displayed in the POI tooltip.

A scale minimum can be decided, in which case the POI will show only when the scale reaches this minimum.

The indications "Pass as close as possible" and "Leave on" (Unspecified/Starboard/Port) are used only when the POI belongs to a pathway that is used for routing. Note that if the pathway is reversed then the indication "Leave on" will be reversed too.

You can define circles around a POI, the distance is calculated using Great Circle. These rings can be used as a barrier.

Marks Management

From the mark menu you can show the POIs management dialog. This allows you to delete, export, edit or center on POIs.

Note that all POIs inside the selection zone will be automatically selected when opening the dialog. From this dialog you can also call the Archive module, which allows you to manage a library of POIs archives:

To insert new POIs into an archive, they must be selected in the previous dialog (POIs management).

Mark menu

Mark menu proposes various actions concerning POIs

POIs can be imported from other sources or from a gpx file.

AVURNAVs

From the Charts menu you can also request "AVURNAVs" and "AVINAVs" (French authorities notice to navigators) for areas Navarea 2, Cherbourg (France Channel), Brest (France Atlantic) and Toulon (France Mediterranean Sea).

AVURNAVs and shown in red, AVINAVs in blue.

Note that you can define an Avurnav as an obstacle or a danger. An obstacle will be avoided by routings and routes, while a danger will trigger various alarms.

POI contextual menu

Most actions related to POIs are available in its contextual menu. For action "*draw a heading*" or "*draw a grib reckoning*" see chapter concerning qtVlm environment, for Route sub-menu see chapter concerning Routes module.

Line between POIs

You can draw lines between POIs, for instance to materialize a starting or an ending line.

Once created, the line shows in its tooltip various information regarding directions and distances

This function can also be used to find the position of an object, by placing several such lines. Place the first POI on the boat and the second one in the measured bearing of the object and repeat the operation several times when the boat has moved enough. The object approximate position will be where the lines are crossing. Useful for instance to find the position of a mark during racing.

Great Circle passing through the boat

It is also possible to draw a GC circle passing through the boat. This is useful for instance to know if you are in advance or not in a fleet racing.

Laylines

You can display two types of laylines from a POI: laylines calculated from gribs data, or/and laylines calculated with NMEA data. In both cases, Currents data are taken into consideration if available. Grib laylines are rendered with dashed lines.

Historical variations of NMEA laylines can be shown as well. The duration of harmonics history is configurable in the main settings, boat's tab. You can reset harmonics history from the POI contextual menu.

Grib laylines will use current grib display date unless NMEA acquisition is started, in which case current date and time will be used.

Laylines show a label with some critical information, and a black dot showing for each one the best position to target on the layline, according to your polar.

Barriers

Barriers management is done via the menu "*Barriers*".

Barriers are positioned with mouse or finger. Once placed you can move points, add/remove points, close the barrier, etc.

Barriers are used by Weather Routing Module and Routes Module. They can be used to force a passage, to define a No Sailing Zone, etc.

Barriers can also be defined as "slow zones", if they are closed areas. In that case you can specify a slowing factor which will be used by Routes and Routings modules.

This feature is especially useful when navigating in Sargasso areas for instance.

Barriers can be locked on the screen, to avoid moving them by mistake while moving the map

POI circles can also be used as barriers, as well as AVURNAVs or shapefiles.

Batch mode

Besides being able to open a grib directly from the command line (just type "qtVlm name_of_grib_file" on the command prompt), qtVlm is also able to run batch commands, either from the command line or from qtVlm menu.

To do that, you must place the commands in an xml files, between a general <runs></runs>, each block of command being inside a <run></run> tag.

For instance, this small xml file will start NMEA reception and record it, then will display a message, wait for 60 seconds and exit qtVlm:

```
<runs>
<run>
      <startNmea>true</startNmea>
      <nmeaLogFile>myNmea.txt</nmeaLogFile>
</run>
<run>
      <userMessage>Nmea started</userMessage>
</run>
<run>
      <wait>60</wait>
</run>
<run>
      <quit>true</quit>
</run>
</runs>
```

You can launch it either from qtVlm main menu, or via the command line, something like

qtVlm run.xml

Supported tags

The following tags are supported:

```
<quit>true</quit>                                <!-- qtVlm exit -->
<wait>seconds</wait>                             <!--  wait n seconds -->
<waitUntil>MM/dd/yyyy hh:mm:ss</waitUntil> <!-- wait until this date (UTC) -->
<userMessage>text</userMessage>                  <!-- display a message -->
<takeScreenShot>fileName</takeScreenShot> <!-- take a screnshot and save it in fileName -->
```

Note : This 5 tags are exclusive, meaning that they should be alone in their <run></run> tag

```
<exportRoutesLogs>true</exportRoutesLogs > <!—Exports all routes logs -->
<exportFolder>folder</exportFolder>              <!—Export folder (not compulsory)
```

Note: These 2 tags must be unique in their <run></run>

```
<startNmea>false</startNmea>                     <!-- NMEA reception starts or stops  -->
<nmeaLogFile>fileName</nmeaLogFile>              <!-- NMEA log file name -->
<closeAllGribs>true</closeAllGribs>              <!-- Close all gribs -->
<clearAllRoutes>true</clearAllRoutes>            <!-- Delete all routes -->
<gribSlot1>fileName</gribSlot1>                  <!-- Grib file for slot1-->
<gribSlot2>fileName</gribSlot2>                  <!-- Grib file for slot2-->
<gribSlot3>fileName</gribSlot3>                  <!-- Grib file for slot3-->
<routingName>name</routingName>                  <!-- Routing name -->
<startPoint>POI name for starting</startPoint> <!-- If empty or missing routing starts from boat -->
<endPoint>POI name for arrival</endPoint>        <!-- Arrival for routing-->
<startDate>MM/dd/yyyy</startDate>                <!-- Start date (UTC) -->
<startTime>hh:mm:ss</startTime>                  <!-- Start time (UTC) -->
<noRouteOutsideScreen>false</noRouteOutsideScreen>          <!-- default true -->
<multiRouting>true</multiRouting>                <!-- Multi routing activated true/false -->
<generateRoutes>1</generateRoutes>               <!-- Nb of routes to be generated -->
<stepDays>1</stepDays>                           <!-- Days step (multi-routing) default 1-->
<stepHours>0</stepHours>                         <!-- Hours step (multi-routing) -->
<stepMins>0</stepMins>                           <!-- Minutes step (multi-routing) -->
<comparatorCsvFile>fileName</comparatorCsvFile> <!—Output file for comparator -->
<convertToRoute>false</convertToRoute>           <!-- Automatic route convert (single routing only) -->
<autoSimpOptim>false</autoSimpOptim>             <!-- With simplification/optimization-->
```

Examples

Launching a multi-routing

```
<runs>
<run>
      <clearAllRoutes>true</clearAllRoutes>
      <gribSlot1>C:/Users/maitai/Downloads/20190522_095140
_.grb</gribSlot1>
      <gribSlot2></gribSlot2>
      <gribSlot3></gribSlot3>
      <routingName>myRoutingName</routingName>
      <startPoint>startPOI</startPoint>
      <endPoint>endPOI</endPoint>
      <startDate>05/22/2019</startDate>
      <startTime>06:00:00</startTime>
      <noRouteOutsideScreen>true</noRouteOutsideScreen>
      <multiRouting>true</multiRouting>
      <generateRoutes>2</generateRoutes>
      <stepDays>1</stepDays>
      <comparatorCsvFile>
myRouteSummaryFileName.csv</comparatorCsvFile>
</run>
</runs>
```

Launching a single routing

```
<run>
      <closeAllGribs>true</closeAllGribs>
      <clearAllRoutes>true</clearAllRoutes>

      <gribSlot1>C:/Users/maitai/Downloads/20190522_095140
_.grb</gribSlot1>
      <gribSlot2></gribSlot2>
      <gribSlot3></gribSlot3>

      <routingName>myRoutingName</routingName>
      <endPoint>endPOI</endPoint>
      <startDate>05/23/2019</startDate>
      <startTime>06:00:00</startTime>

      <noRouteOutsideScreen>true</noRouteOutsideScreen>
      <multiRouting>false</multiRouting>
      <convertToRoute>true</convertToRoute>
      <autoSimpOptim>true</autoSimpOptim>
</run>
```

qtVlm Companion

qtVlm Companion is an Android application also compatible with Android-Wear (watches). It serves as a light repeater for qtVlm, and is able to show data, but also charts, AIS, WP information, Anchor, etc.

There is also an iOS version, only for iPhones or iPads.

See [Companion documentation]() for more details.

Tutorial Videos

David Burch from Starpath school has made some very nice tutorial videos:

https://www.starpath.com/qtVlm/qtVlm_playlist.html

Also don't miss David's excellent cheat sheet about qtVlm, a work in progress but many useful tips inside:

https://www.starpath.com/qtVlm/