

Introduction to Karto

Version 2.0

Guided tour

1 Introduction

The purpose of this document is to provide succinct information of the Karto's features and of the various steps related to its use.

For a more exhaustive documentation, and to answer more complex related queries, please refer to the reference manual: [help.html](#)

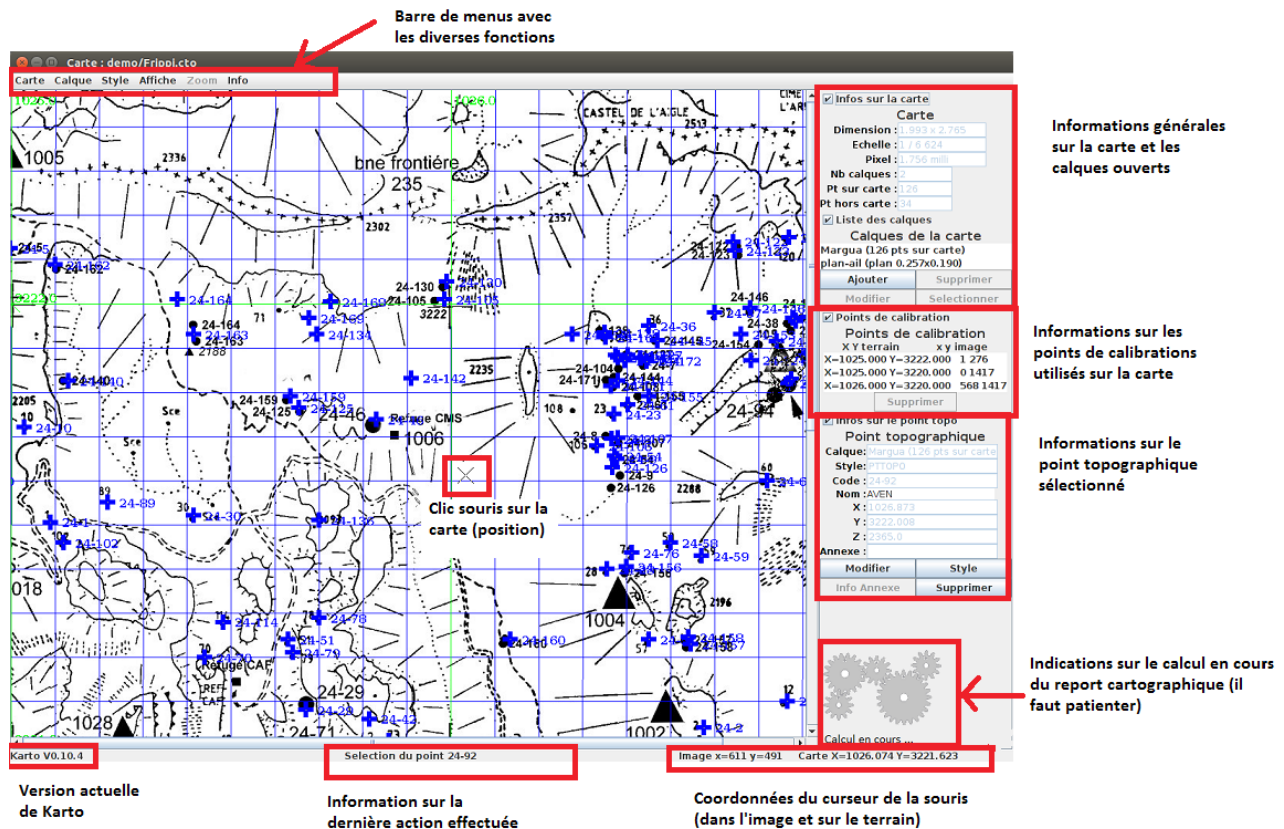
This introductory manual completely describes the use of the software, and to get the most out of it, it is recommended that you perform all the functions of the Karto software whilst following the flow of the manual. All the required files are provided with the standard installation of Karto, and are taken from the "Inventory of Cavities Marguareis" document, edited by Patrick MICHEL for the Speleological Committee of Alpes-Maritimes (CDS 06).

Tour proceedings:

2 Launch of Karto

The Karto installation provides a `karto.bat` and `karto.sh` script (for Windows and for Linux); use one or the other (based on your environment) to launch the software. This will open (always under Windows) a DOS window, with a black background, which will provide a log of the execution of Karto (to be investigated in case of problem) ; and it then opens the Karto window itself.

3 Presentation of the interface



The karto interface is similar to the previous interface, but incorporates a few improvements.

The right banner shows the map information, the open layers, the calibration points used to calibrate the map, and displays information related to the selected topographic point. A small image appears intermittently at the bottom right to indicate that a "big" calculation is in progress and that the map will be refreshed with the new data when the calculation has been completed. The calculation time depends on the power of the machine, the size of the base map, and the number of layers of images projected on the map. The program does not require much in term of machine resources, unless it has to process very large maps (several tens of MB of jpeg file), or unless it has a large number of plans to report (management heavier than the topographic points).

The top banner contains the menu bar and the functions available in karto. Note that some functions are available from the right banner, or popup menu on the map (right mouse click).

The bottom banner is an information banner updated automatically and continuously. It displays the last operation performed on the map, as well as the position of the cursor on the map, and with coordinates in the image as in the field, after the map is calibrated.

4 Creating and Calibrating a map

To open an image, go to the menu Map / Open image. A dialog window opens that allows the selecting of the desired image. The format must be a jpg, gif, png or bmp file. The image can be the scan of a map, a map, or even an aerial photo. The calibration program makes it possible to use images that would be slightly in perspective, it may then be necessary to take more calibration points.

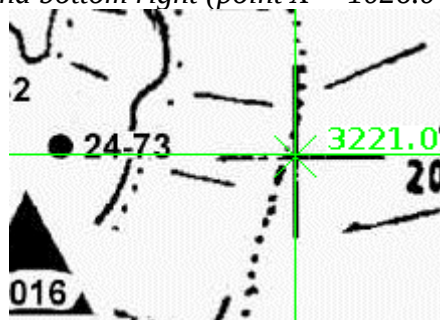
Example: Open the file "Refuge.jpg" provided in the demo-margua directory

4.1 Calibration

The calibration consists of entering the coordinates of points (calibration points) on the map. This operation is necessary before you can position points on the map whose coordinates you possess.

The coordinates of the calibration points, and the coordinates of the points that you will have to position, can be indicated in any orthonormal system (Lambert, UTM, ...) in any unit (kilometers, miles, meters, ...). We usually use coordinates in kilometers.

Example: At the top left of the map, find the cross of the kilometric grid (Lambert 3, in this case). Click in the center of the cross with the left mouse button. An input window appears, in which you enter the coordinates of this point $X = 1025,000$ $Y = 3221,000$; click OK to validate this point. In the same way, enter the coordinates of two other points, for example the cross-hairs at the top right (point $X = 1026.0$ $Y = 3221.0$) and bottom right (point $X = 1026.0$ $Y = 3220.0$)



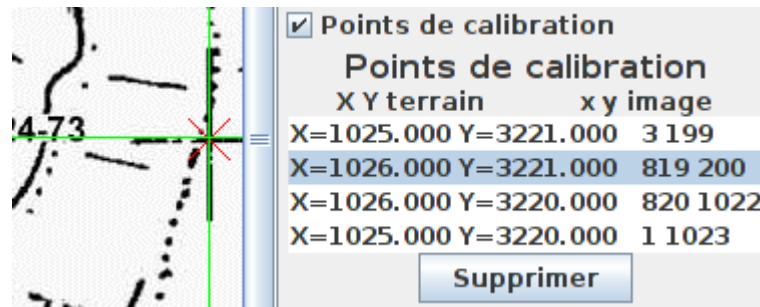
Example: Once you have set at least 3 calibration points, you can calibrate the map (Map / Calibrate menu). Note that this operation is done automatically by the Karto program as soon as (at least) 3 calibration points are available. Any addition or deletion of calibration point causes an automatic recalculation of the calibration. This function has been kept in the menu to accommodate users of the previous versions of Karto..

The more points you enter, the more precise the result will be (the error is spread over the number of points). To get a better result, it is recommended to spread the points on the map (at the four corners, on the edges).

The calibration is complete, the map grid is displayed. Check the quality of your calibration: the lines of the grid (if the map is not too skewed) must pass exactly through your calibration points as crosses were used. If the grid is not correct, it is most likely that your coordinates are wrong: Do check them, delete the erroneous points, and make the necessary changes:

Example: In the list of calibration points (at the top right of the Karto window), select a point, and use the DELETE button to delete it. Add two calibration points, and redo the calibration.

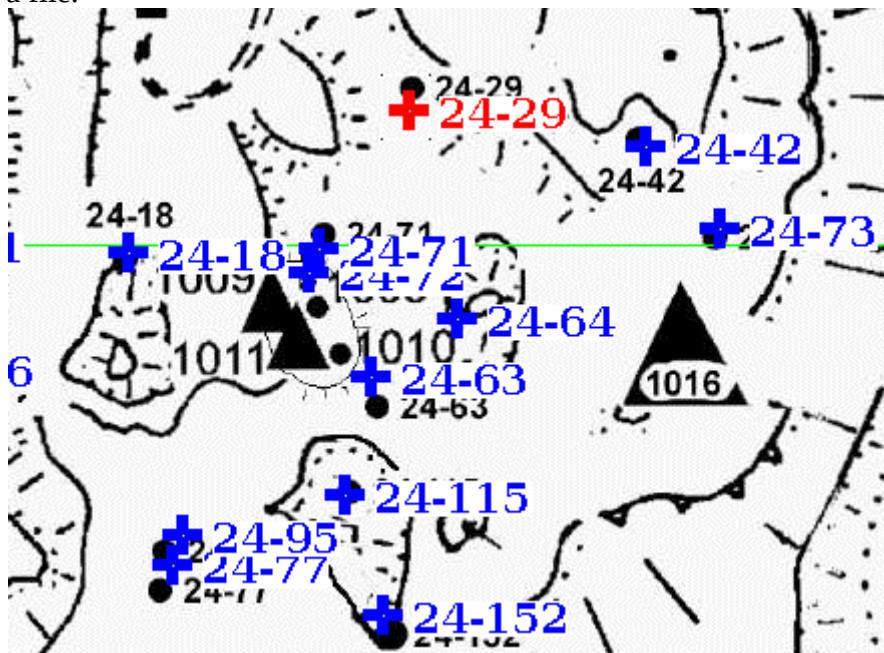
If desired, you can display the grid coordinates along the edges of the map (View menu / Coordinates of the Grid).



4.2 Topographic Points

You are now ready to place points on your map. This can be done from a file or in an interactive manner.

Let's start with a file.



Example: Use the **Points / Open** menu. In the window that appears, select the file margua.tab (it comes from the cavities database of CDS 06). The cavities are displayed on the map:

You can interactively add topographic points. Go to the menu **Points / Position a point**. A window opens and allows you to enter information related to the point to be positioned. After validation, the point appears on the map.

Or right-click directly where you want to position the point. In the context menu, use the **Add Topo Point** function. The point definition window appears with the coordinates already in place, all you have to do is give it a code and a name.

You can also modify the elements (position, code, name) of a topo point. To do this, first select it on the map and then make the desired modifications:

Example: With the left mouse button, draw a rectangle around points 24-77 and 24-95 of the tip of the map above. By clicking with the right button in this rectangle, a window appears which contains the list of the points contained in the rectangle. Select the one you want, and click Ok.

The point elements are then displayed in the "Point Topo" area, and the selected point has changed color on the map. Edit a coordinate and click the Edit button: the point moves on the map.

4.3 The point files

You have loaded points, you have added them interactively, you have corrected them, you can now update your points file, or save them in a new file, using the Point / Save and Point / Save As menus.

4.3.1 Text file

Topo point files are text files, containing one line per point, each with the following information:

CODE	X	Y	Z	Nom complet	Style
------	---	---	---	-------------	-------

This type of file can be created manually using your favorite text editor (emacs, Word saving in text format, Excel saving in TAB or SCV, Edit, Gedit, etc.), or generated from a database...

Practical tip:

Create a single file of topos points (for the same geographical area grouping several maps, such as a park boundary or a mountain area). This avoids having to search for the correct file. The program optimizes its calculations and searches by filtering the points. Only points on the current map are stored and displayed.

Sample file:

#FICHPTS

#VERSION=2.5.0

24-110 1025.8 3220.24 1920.0 AVEN DU PLAN DE SCOVOLA PTTPO

24-111 1025.56 3220.3 1990.0 AVEN DU CHARDON PTTPO

24-52 1025.4 3220.32 2000.0 AVEN CALAN d'OS PTTPO

4.3.2 GPS Files

Karto can read the points files provided by a Garmin GPS (or compatible): GPX files (GPX compliance: https://en.wikipedia.org/wiki/GPX_Exchange_Format)

WayPoint lists are supported, along with tracks and routes.

Traces and routes can be displayed with particular colors

4.3.3 XML Files

A simple XML file format is also proposed. The purpose of this file format is to allow exchanges with other applications (in import or export). This format is very simple. But it is also possible to save (and work) your data in this file format.

Example:

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
```

```
<points>
```

```
<pt>
```

```
<X>1025.985</X>
```



```

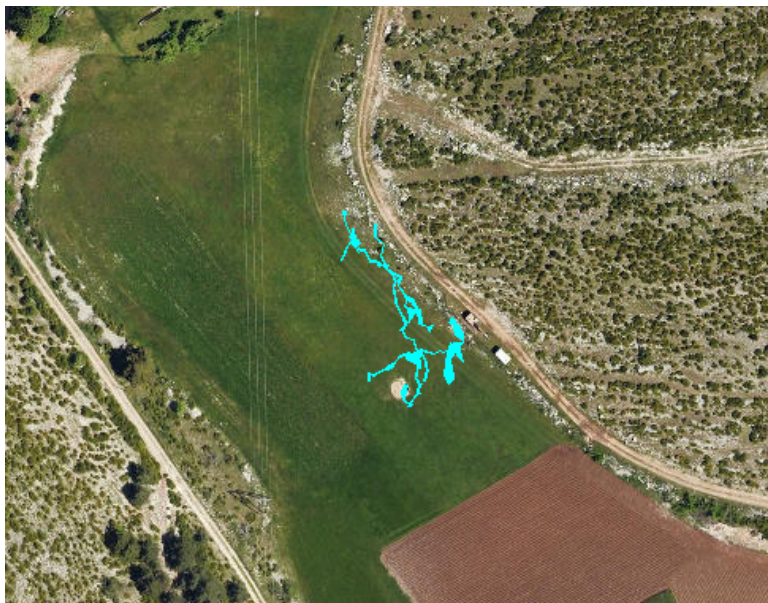
<Y>3222.010</Y>
<Z>2190</Z>
<code>24-105xml</code>
<lib>AVEN MONGOLITO</lib>
<style>PTT0P0</style>
<annexe>doc/mon_info.html</annexe>
</pt>
....
</points>

```

For more details, see the full [Help_en.pdf](#) documentation.

4.4 Image files (or plan)

Karto also makes it possible to post on a map a plan or graphic, in the form of an image (GIF, PNG, ...) transparent or not. A function makes it possible to automatically consider that the background color of the design (the color most often present in the image) as the "background color", and thus to make transparent. This will prevent you from "erasing the white" of your plans and graphics. For more details, have a look to the general documentation ([Help_en.pdf](#)) chapter 3.3.5 Image layer.



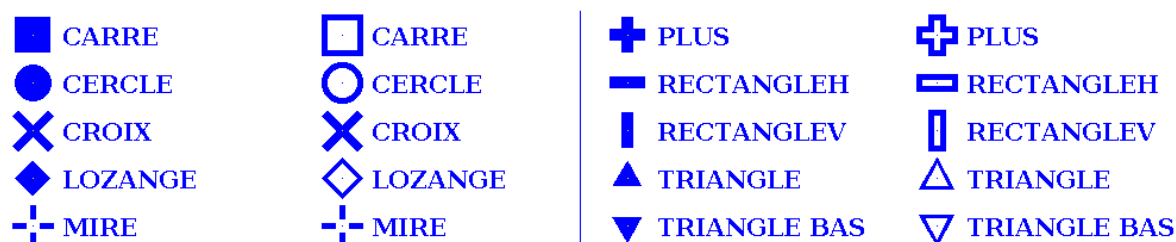
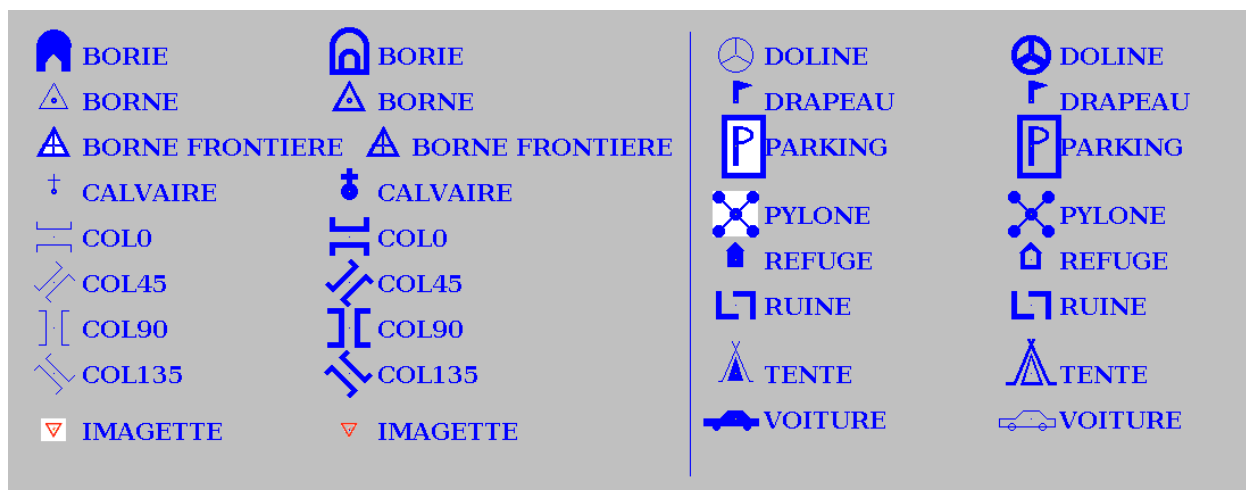
Example of postponement of a plan (here in blue sky) on a map (aerial photo)

4.5 Point styles

Depending on the types of objects inserted, and to improve the readability of the map, we will use different "point styles", characterized by the visual elements constituting the point: symbol used, color, size of the symbol; color, size and font of the displayed text. Karto provides a number of symbols to build new styles.

4.5.1 Many symbols

Each topographic point can be represented by a symbol in a particular color. The list of available symbols in standard is wide:



This list is not exhaustive: it is possible to define your own symbol, without programming, simply by using a small GIF (or PNG) image of your choice. For more details, refer to the general documentation ([help_en.pdf](#)), chapter 4 Styles specification

4.5.2 Changing the style of one or more points

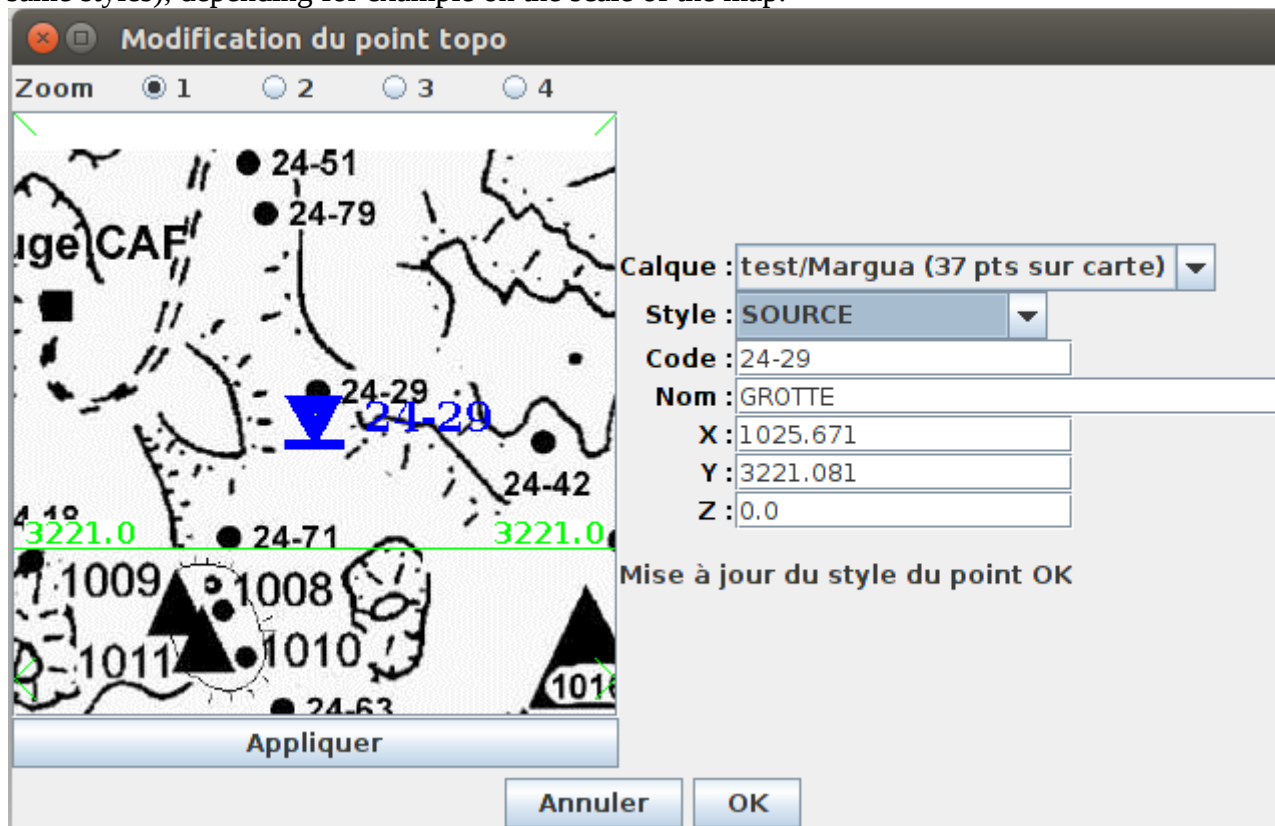
Example: Select a point on the map (click the mouse button and drag the cursor around the point, keeping the button pressed). When the topo point appears at the bottom right, click under the "Edit" button.

A window appears, which allows you to change the format of the selected point. Change the characteristics as you please: change the style of the point, its code, its coordinates

You can check the effect obtained, and readability, using the "Apply" button located under the card extract.

4.5.3 Style files

Styles are identified by names (the default style is PTTPOPO). You can create new styles by using the new button in the Edit Styles window. The set of style definitions linked to a map can be saved to a Style File using the Style menu functions. It can be useful to define several style files (for the same styles), depending for example on the scale of the map.



5 Print or Export an image

That's it, your points have been inserted on your calibrated card, each with a suitable style. All you have to do is export the result into a usable image format.

Save the image of the entire map, or rectangular area, in an image file (JPEG, PNG). It can then be included in a drawing software, to be printed in the desired way, or integrate it into a document (as was done with all the map extracts of this tutorial).

Example: Select a small area on your map, and use the **Save Selection** function in the context menu. Specify a file name suffixed in jpg, for example '**foo.jpg**'; validate, and your file is created.

6 And then?

You have completed this tour. If you are looking for more specific information about Karto, you can find it in the full help (reference manual) available with the software, and on the Karto website: <http://karto.free.fr>.

For more information, you can also contact us by email at: karto@free.fr

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