CoMoMap : User's guide

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CoMoMap : COndor MOving MAP V1.5

CoMoMap is an external navigation software for **Condor**, derived from **VerifLocal**
It displays a moving map at various pre-selected scales

It can compute the extensive reachable area, and the path to the next Turn Point
The reachable area is calculated using Condor topographic data with a resolution of 90m.
 In case the reachable area is large the resolution can be degraded to limit the computation time.

In the case of networked flights, if the server(s) send data to cunimb.net, it is possible to display the position of other gliders in a similar way to what is available on the web.

CoMoMap only works with **Condor** version 2 or 3.
It uses data that **Condor** sends on the **UDP** and **NMEA** ports, so it does not work for tasks without PDA

If the UDP data is unavailable, CoMoMap will function, but the MC setting and the Water Ballast will be the last known values (possibly 0 - the values will be greyed out in the sidebar).
The arrival and reachable zone calculations will be made using the Glide Ratio corresponding to these values.

It is preferable to use **CoMoMap** on a second screen or in virtual reality

In case of first use, reading the INSTALLATION section is strongly recommended

Language support and units

CoMoMap will try to detect the default language of the computer (currently only English or French, for all other languages English will be used).

The program works with metric units. Inputs and display may be in Imperial or Australian units

NOTE : Illustrations in the following text below have been taken from the French version with metric units
		Some illustrations were made using earlier versions.

USAGE

Virtual Reality usage

In order to avoid warning or error popup windows which can steal the context from Condor, it is strongly recommended to disable them, as well as the confirmation of glider data download
In the **CoMoMap.ini** file,set:

- **Disable_Warnings=1**
- **Confirm_Update=0**

Startup

You should start the applications preferably in the following order:
VSPE (or equivalent)
CoTASA (if applicable, may be started anytime actually)
Condor
CoMoMap

It is also possible to activate a waiting mode (**-wait** on the command line or **Wait=1** in the **CoMoMap.ini file**)
CoMoMap will wait for the update of the **DOCUMENTS\Condor\Pilots\PILOT_NAME\FlightPlan.fpl** file
In this case, it is necessary to start **CoMoMap** BEFORE **Condor**, otherwise it will wait forever (only 12 hours actually)
It is possible to exit the wait mode : hit either "Zoom" key, or the "S" key when **CoMoMap** has focus

In the case of Condor 3, airspace detection will be pre-calculated, which may take several tens of seconds.

Parameters

Some parameters are only available in the **CoMoMap.ini** file, see comments in the file for more information
The command line options (e.g. **-wait** and **-fma:ALT)** override the definitions read in **CoMoMap.ini**

If you are using multiple monitors, **CoMoMap** can be moved anywhere
To save the window size and position: type "**E**", when **CoMoMap** has the focus, then save the configuration

The display of the altimeter profile at start-up can be enabled/disabled (.ini file**: Show_Profile)**
The maximum elevation profile altitude can be adjusted (.ini file**: Profile_max_alt)**
The display of the reachable zone at start-up can be enabled/disabled (.ini file**: Show_Reachable_Init)**

Choice of map used at startup ((.ini file: **Default_Map)**

The default view can be selected (dialog box and .ini file: **Preset_View)**
The size of the centred view can be adjusted (dialog box and .ini file: **Centered_View_Size)**

The wind can be displayed in real time on the map (if UDP data is available - .ini file: **Real_Time_Wind)**
The thermal mode view can be centred (real-time wind averaged over 30 seconds - if UDP data is available - "Toggle Therm. Cent." key, dialog box, toolbar and .ini file: **Center_Thermal)**

It is possible to display the wall clock time in the sidebar (.ini file: **Show_Wall_Clock)**

A number of display parameters are available in the .ini file: glider icon scale, wind arrow scale, task line colour and width.

Glider data (automatic update)

The glider data are stored in the **Polars_data.txt** file
It can be updated automatically from the condorutill.fr website
See **Auto_Update_Data** in the **CoMoMap.ini** file
The **Glider_data.txt** file was used up to version 1.1, it is not needed anymore, it can be discarded

Setup dialog box

If you click [OK], the settings are not automatically saved in the **CoMoMap.ini** file.
To save them, you will have to click [Save] or save them explicitly (Menu: Setup/Save Setup)

If an input box turns red when you hit [OK] or [Save] it means the value is invalid, right-click in the input box to see an error message

Clicking in a "colour" box opens a colour picker

To change a key definition, click in the corresponding box, it turns light blue and displays "Hit a key".
Hit the desired key or combination of keys (see below). To cancel, click outside the active box.
To delete a key assignment, use CTRL-Enter

CoMoMap Setup	
CoMoMap Setup - V1.5.0.0	

Condor

☐ Wait for Condor	☑ Arm Start
`0` Finish Min Altitude (m)	

☑ Show Weather Zones `#7EC0FF`

☑ Cunimb ☑ Hide when in thermals
`20` ⬍ Cunimb track length
`20` Gnd clearance (m) ☐ Total Energy

☑ Airspace `3` ⬍ Warning dist (km)

`Bot-L` ∨ Elev Profile `75` ⬍ Opacity(%)

`Task` ∨ Default view
`10` Centered view radius (km)
☑ Auto Thermal Mode `8` ⬍ (s)
`2` ⬍ Thermal dots: # of turns (~30s)
☑ Therm View Center ☑ Real time wind

`0` ⬍ Glider icon scale (0=default)
`#0000FF` Wind arrow `0` ⬍ Scale
`#32A0FF` Task line `3.5` ⬍ Width
`Metric` ∨ Units `14` ⬍ Font Size
☐ Disable Pop-ups

Keys   (CTRL-Enter to delete)

Views	`INS`
Toggle TE	`3`
PerfDegr -	`1`
PerfDegr +	`2`
Th View Cent	`LONG+INS`
Zoom -	`PG.PREC`
Zoom +	`PG.SUIV`
Toggle Map	`FIN`
Toggle Cunimb	`U`
Show Prev TP	
Show Next TP	
Go To Next TP	`LONG+ORIGINE`
Reset Task	`SHFT+ORIGINE`
Show Elev Profile	`SUPPR`
Show Reqd GR	`LONG+SUPPR`
Show Reach. Zone	`LONG+FIN`
Show FPL	`!`
Show Keys	`LONG+!`

Reachable Zones

`Wireframe` ∨ Display `#CC88FF` Wireframe

`180` ∨ Min grid size (m) `720` ∨ Max grid size (m) ☑ Local refining

`None` ∨ Display arrival height ☐ Only if below `0` (m)

OK	Save	Cancel

Menu bar

The menu bar is optional (see the CoMoMap.ini file), the command texts should be self-explanatory
Most commands are described below

Toolbar

Setup	Togg View	Zoom In	Zoom Out	Cndr Maps	Togg Maps	GoTo NxTP	Show NxTP	Show Prof.	Show Rch	Show GR	Show Task	Show AS	Det. AS	FPL Info	Key Defs
Rst Kbd	Exit														

The toolbar is optional, it can be fixed or floating (it is activated when the mouse cursor approaches the top of the window) and is fully customisable (see the **CoMoMap.ini file**)
Red/green button text show the current state of the commands that can be toggled

Command names in the toolbar should be self-explanatory, for more details see the list of commands available in the toolbar which may be found in the Annexes

Keyboard shortcuts

Some keys are detected when **CoMoMap** does not have focus (defined in the dialog box, see above):

- Views   Pre-selected views: reachable area, task, +/-10km, thermal, next TP
- Toggle TE   toggles the use of Total Energy for calculations
- PerfDegr –   decreases the value of the performance degradation coefficient
- PerfDegr +   increases the value of the performance degradation coefficient
- Th View Cent   toggles the re-centring of the thermal view (compensates for wind drift)
- Zoom +   zoom in
- Zoom -   zoom out
- Toggle map   toggles between Condor map, wind-, relief- or sun- shaded maps
- Cunimb   toggles the display of other gliders (if cunimb is activated)
- Show Prev TP   display of distance and DDH to prev. TP in the list (if not assigned: Condor key)
- Show Next TP   display of distance and DDH to next TP in the list (if not assigned: Condor key)
- Go To Next TP   Validates the next TP
- Reset Task   resets the task (useful if an unwanted start has been detected)
- Show Elev Profile   toggles the display of the elevation profile and changes position
- Show Reqd GR   toggles the display of the required glide ratio (see below)
- Show Reach. Zone   toggles the calculation and display of the reachable area
- Show FPL   displays the flight plan data summary (see below)
- Show Keys   displays the key definitions

It is possible to use modifier keys: CTRL, SHIFT, ALT. It is also possible to detect long presses.
This allows to use the same physical key for more than one functions (see examples above)

The left and right CTRL and SHIFT keys are not differentiated as modifiers, only the left ALT key can be used for this.

The keys CTRL (L&R), SHIFT (L&R), ALT (and ALT GR or ALT (R), if applicable) can also be used as single keys (long presses are possible)

All the keys on the keyboard are in principle usable, but, depending on the NUMLOCK state, the SHIFT key may not work with the numeric keys (0-9) of the keypad (tested only on French AZERTY keyboards)

More than one modifier is possible, one could even consider complex combinations like LONG+CTRL+SHFT+ALT+F8, but this is probably not very ergonomic.
However, this would allow the same key to be used several times for different commands, with different modifiers, if a tool like **JoyToKey** is used.

In the dialog box and the .ini file, SHIFT is abbreviated to SHFT

If you use the Condor flight computer, it is possible use the Condor keys "**Flight comp next TP**" and "**Flight comp prior TP**" instead of the "**Show Next TP**" ; key to do this, de assign them

Important notes:
If the keystroke detection does not work anymore:
- If the Condor chat is activated, the key detection is deactivated, this is indicated at the bottom right of the window (**Chat Active**). To deactivate it press the **ENTER** key
- If not, give the focus to **CoMoMap.exe** and press **CTRL-K** to restart the keyboard hook or click "**Rst Kbd**" in the toolbar or select **File/Restart** keys in the menu bar
- If this happens too often, you can activate a periodic restart of the keyboardhook: **KbdHook_Auto_Restart** in the CoMoMap.ini file.

A number of possible combinations are keyboard shortcuts used for Windows or other applications : e.g. **CTRL+ALT+DEL**, **ALT+TAB**, so avoid programming them

Condor and **CoTASA** (versions before 3.1) detect keystrokes even if modifier keys are used, so avoid using the same keys as **Condor** and **CoTASA.**
The **CoKeAs** application may be used to list key definitions used by **Condor, CoTASA and CoMoMap**

It is recommended to test that the selected keyboard shortcuts work correctly before using them regularly (especially in competitions)

Task start

If **CoMoMap** was started after you crossed the start line or if **CoMoMap** detected a line crossing before the gate was opened, use the "**Go To next TP**" key or the "**GoTo NxTP**" toolbar button or the "N" key (when **CoMoMap** has the focus) to activate the next TP (average speeds will be wrong)
It is also possible to reset the task by repeating this keystroke until the finish line or by using the "**Reset Task**" key

To avoid this problem, it is also possible to impose manual arming of the start: crossing the start line will only be detected if it has been previously armed.
Check box in the dialogue box / .ini file
To arm the start, use the "**Go to next TP**" key
If the start is not armed and the glider is close to the line, the display flashes.
Once the start is armed, the start sector turns orange

DISPLAY AND MAPS

At startup **CoMoMap** displays key definitions and FPL information (when available)

|				
PG.SUIV	Zoom In		Base	
PG.PREC	Zoom Out		Wind	
INS	Preset Views		Direction	242.3
LONG+INS	Toggle Therm. Cent.		Variation	Low
FIN	Toggle Map		Speed	28.7 km/h
	Show Next TP		Variation	Low
	Show Prev TP		Turbulence	Slight
LONG+ORIGINE	GoTo Next TP		Upper speed	35.0 km/h
SHFT+ORIGINE	Reset Task			
SUPPR	Show/Hide Elevation Profile		Thermals	
LONG+SUPPR	Show/Hide Required Glide Ratio		Cloud base	3000 m
LONG+FIN	Show/Hide Reachable Area		Variation	Low
U	Cunimb		Invers. height	4085 m
2	Perf Degr Coeff Incr		OverDevelop	0 %
1	Perf Degr Coeff Decr		Strength	Moderate
3	Toggle TE		Variation	Very low
!	Show FPL Data		Width	Normal
LONG+!	Help		Variation	High
			Activity	Normal
			Variation	Low
			Flats Activity	Normal
			Turbulence	None
			Streeting	Moderate
			Bugs	None
			Date	21/06/2025
			Max engine alt	2004 m
			Start mx spd	170 km/h
			Cloud pen	100
			Midair repair	OK
			Regatta start	

The FPL information will then be displayed for 30 seconds as an overlay on the map

This data can be displayed at any time by using the '**Show FPL**' key, see the **Weather zones** section below

By default, the Condor default map for the landscape will be used
NOTE:
CoMoMap only supports 24- or 32-bit BMP maps. If the default map is incorrectly read, CoMoMap will display the map shaded by the relief.
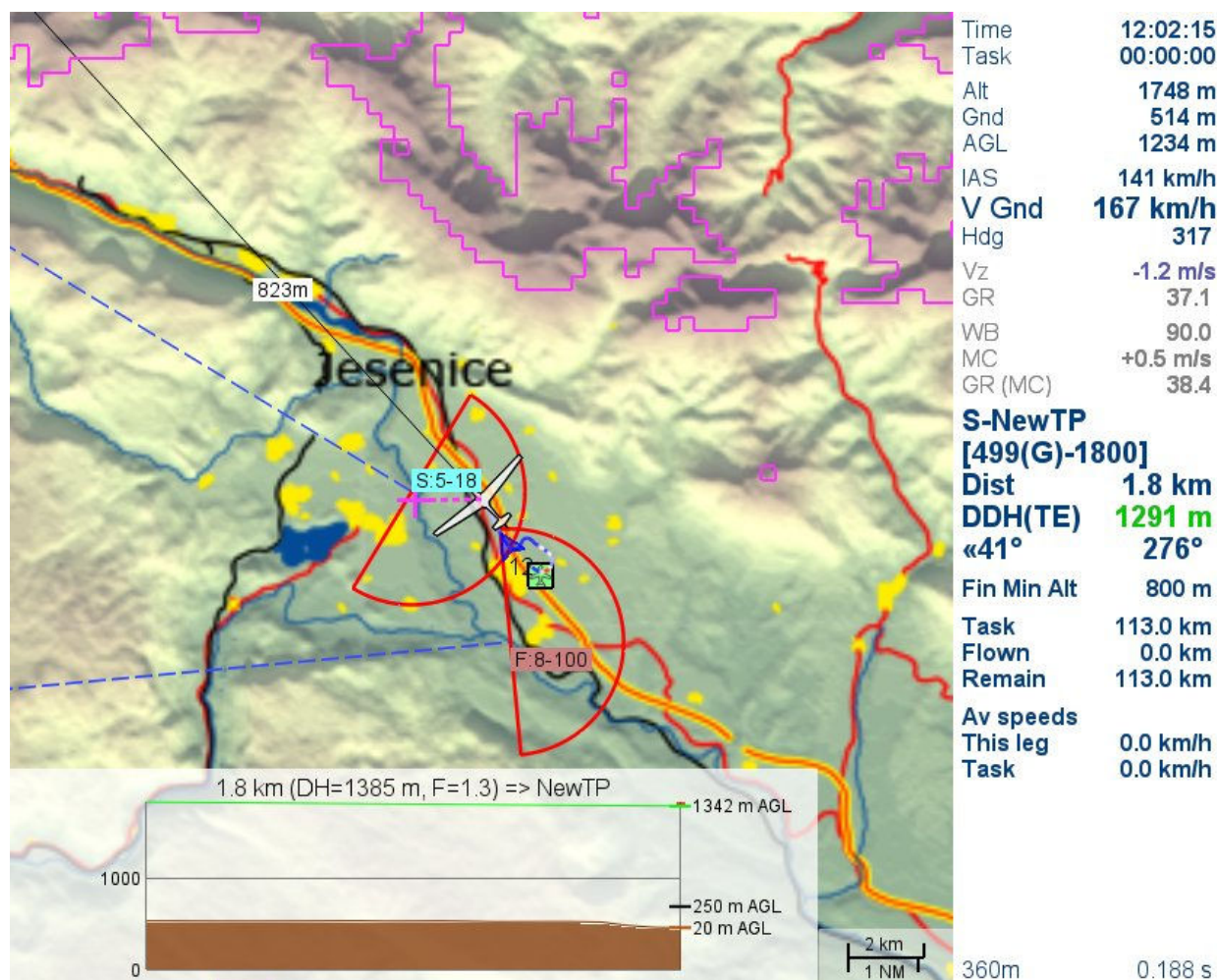
It is possible to define a list of suffixes that will be appended to the landscape name to select alternative maps
The resulting map files will be searched in the order of the list.
If no map alternate map is found, the default map will be used
Example : **Map_Suffixes**=_HB2,_HB,_AE

It is also possible to select another Condor map through the menu: Display/Change Condor Map or the "Cndr Maps" button of the toolbar

The font size can be set in the Setup box or the **CoMoMap.ini** file (**Font Size**=VALUE)
The size of the glider icon varies with font size

Turnpoint labels indicate turnpoint number (S=start, F=finish) and minimum and maximum altitudes, rounded to the nearest 100m (or ft)
If the label is green, no limit is set (minimum value=ground elevation).
If it is brown, the minimum altitude is set.
If it is sky blue, the maximum altitude is set.

These altitude limits are also indicated in the sidebar for the next TP (between [ ], G=ground)

Condor penalty zones or airspace are taken into account (see below)

It is possible to display a wind-shaded map (if non-zero, see below), a relief-shaded map or a sun-shaded map (updated every 20 minutes).
It is possible to switch between the Condor map, the wind-, the relief- or the sun-shaded map with the "Toggle map" key or the "Togg Map" toolbar button

The colour vs. altitude table is defined in the **AltCol.txt** file.
You may edit this file according to your preferences. The file format is described in the annexes
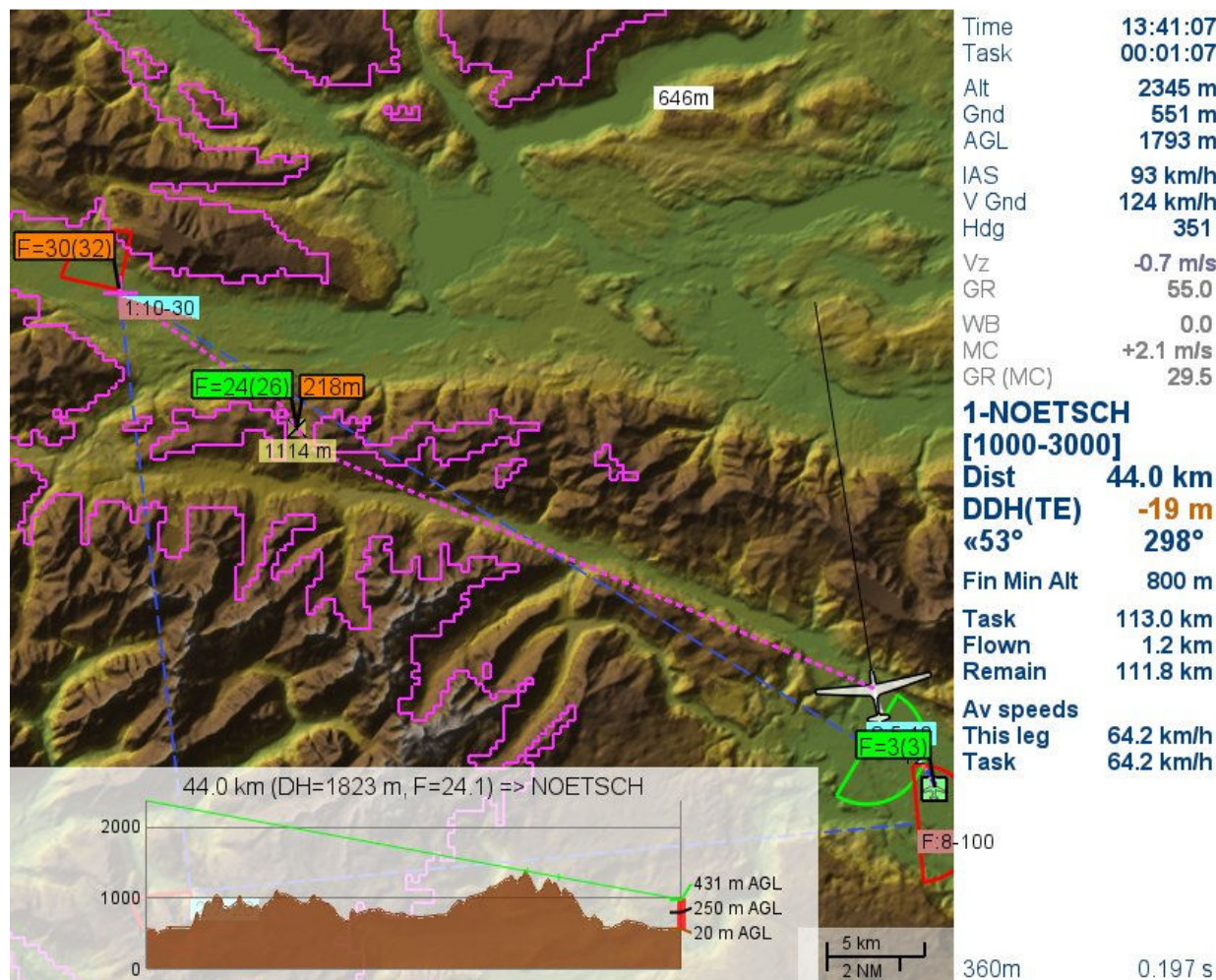
When **CoMoMap** has focus it is possible to get the elevation of a given point by hovering the mouse cursor above the map (646m in the picture above)

Markers

It is possible to add markers when **CoMoMap** has the focus
Place the mouse cursor at the desired location (inside the grey rectangle) and hit the "M" key or click the right mouse button
The label (light yellow) of the marker indicates the ground elevation (1114m in picture above)
The height of arrival at the marker will be indicated in the same way as for aerodromes or landable areas (218m in picture above)

It is currently not possible to delete, modify or save markers.

Required glide ratio

It is possible to display the glide ratio necessary to reach the aerodromes, landable areas, markers and the next turn point ("F=", in the picture above, "GR=" if English is selected).
This glide ratio is calculated without margin and takes into account the wind
If the wind is not zero, the value in brackets is the geometric glide ratio

Target TP information is displayed in dark blue if it is the next TP, otherwise grey (see below), green when the task is finished

If a TP is a circular sector (360°), the target point will be taken at the intersection of the circle and the bisector of the angle formed by the two branches of the circuit attached to this TP.

The height (in relation to the minimum altitude, except for the start line: maximum) at the next TP (**DDH**) can take into account (**TE**) the total energy available (by slowing down to the best glide speed <u>at the current wing loading</u>).If **TE** is selected, both DDH values are shown

Note: if the UDP data are unavailable, some of the data in the sidebar will be greyed out (see image below) and calculated from the trajectory or not updated (MC, WB)

In particular, the calculations of arrival and reachable zone will be made with the Glide Ratio corresponding to the last known MC value
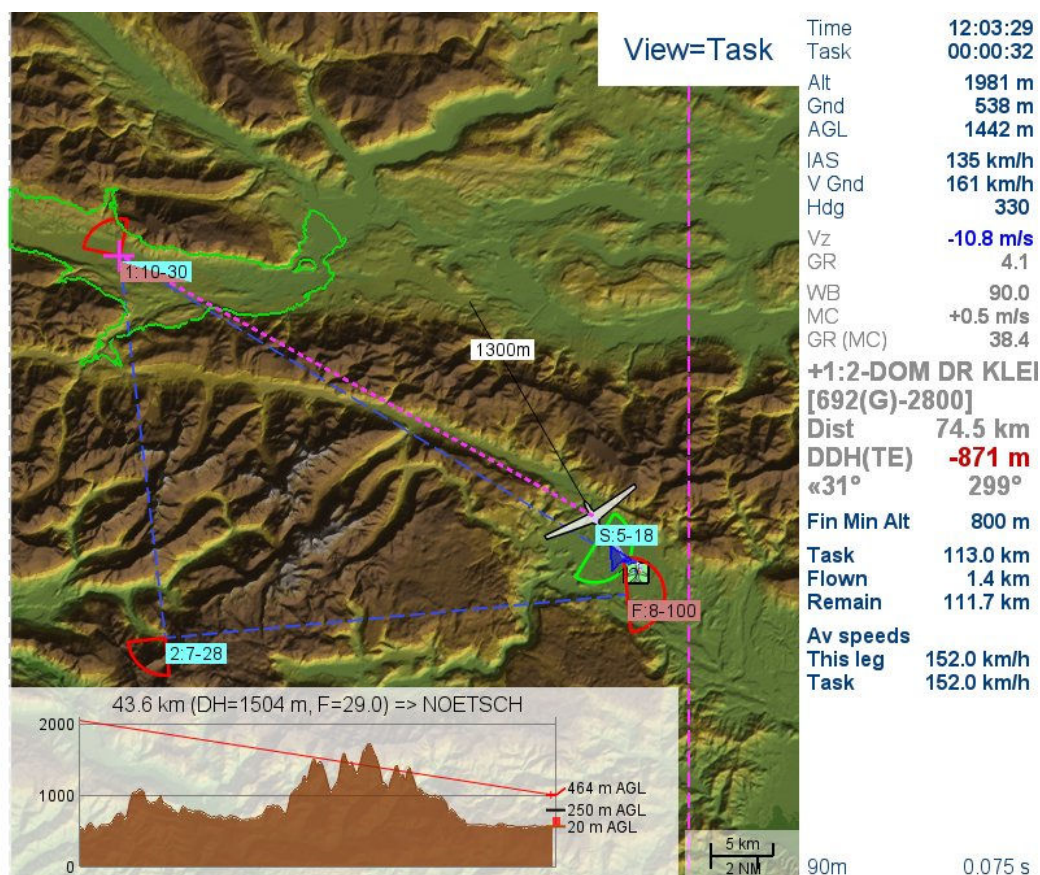
Reachable area

CoMoMap determines at any time the reachable area taking into account the MC setting and the wind (taken from the .fpl file). The "Show Reach. Zone" key and the "Show Rch" toolbar button toggle the calculation and display of the reachable area

It is possible to degrade the theoretical Glide Ratio by means of a coefficient displayed in the sidebar. This coefficient can be adjusted using the **PerfDegr –** ou + keys

The "**Show Reach. Zone**" key and the "**Show Rch**" button on the toolbar activate/deactivate the calculation and display of the reachable zone.

If the next TP is reachable, the path is displayed in the same colour as the reachable zone, otherwise black. The elevation profile is displayed in both cases.

Aerodromes, landable areas, markers and the next turning point will be labelled with the arrival altitude if it is below a predefined value (218m in the picture on previous page)

If the next TP is reachable and you hit the **"Show Next TP"** key (or the corresponding Condor key if used), or the « **SHO NxTP** » button in the toolbar, the reachable area will be computed starting from the next TP at the altitude at which you would arrive. The colour of the reachable area contour is then set to its complementary colour (green if default setting, see image above)

Elevation profile (aka Side view)

The elevation profile can be displayed towards to any TP. Beyond the next TP, trajectories are straight lines.

The airspace is displayed (if there are more than two vertically disjointed zones at a given point on the trajectory, not all of them will necessarily be displayed).

NOTE: the elevation profile is computed towards the grid point closest to the target point.
If the grid is coarse and the ground is not flat, this may produce some differences in terms of arrival height
In a straight line, small differences in DDH with Condor may be seen (approximate glide polar)

The visibility and position of the altimeter profile can be modified using the "**Show Elev Profile**" key.
Possible positions are :
Bottom-Left, Bottom-Wide, Bottom-Right, Top-Right, Top-Wide, Top-Left

The maximum profile altitude can be adjusted, see **Profile_max_alt** in the CoMoMap.ini file
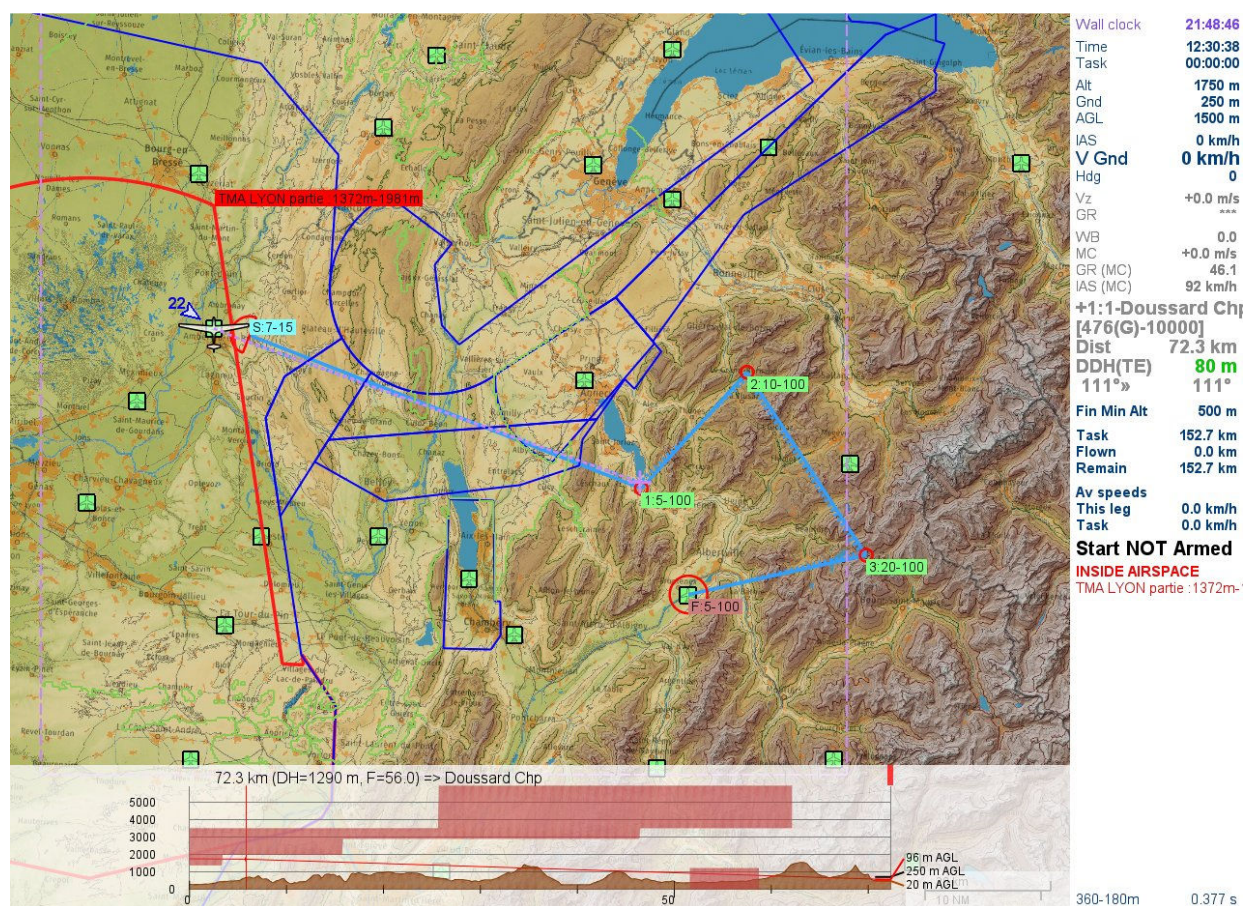
Thermal mode

In thermal mode, the trajectory line thickness and colour vary with climb rate (compensated if UDP data are available)
The cross indicates the center of the circle tangent to the path (if UDP data is available)
The cyan arrow indicates the exit direction to the next turn point (which may be different from an indirect route if it exists, see below)
If the zoom factor is modified in thermal mode, it will be saved for the next activation of the mode

It is possible to compensate (or not) for wind drift in thermals (30 seconds average wind)

It is possible to activate the automatic switchover to the "thermal" view
On exit from the turn, the view returns to the preselected view and zoom factor used before entry

Please note: the automatic mode only works if the UDP data is available. If it is not, some of the data in the sidebar will be greyed out (see below) and calculated based on the trajectory or not updated (MC, WB)
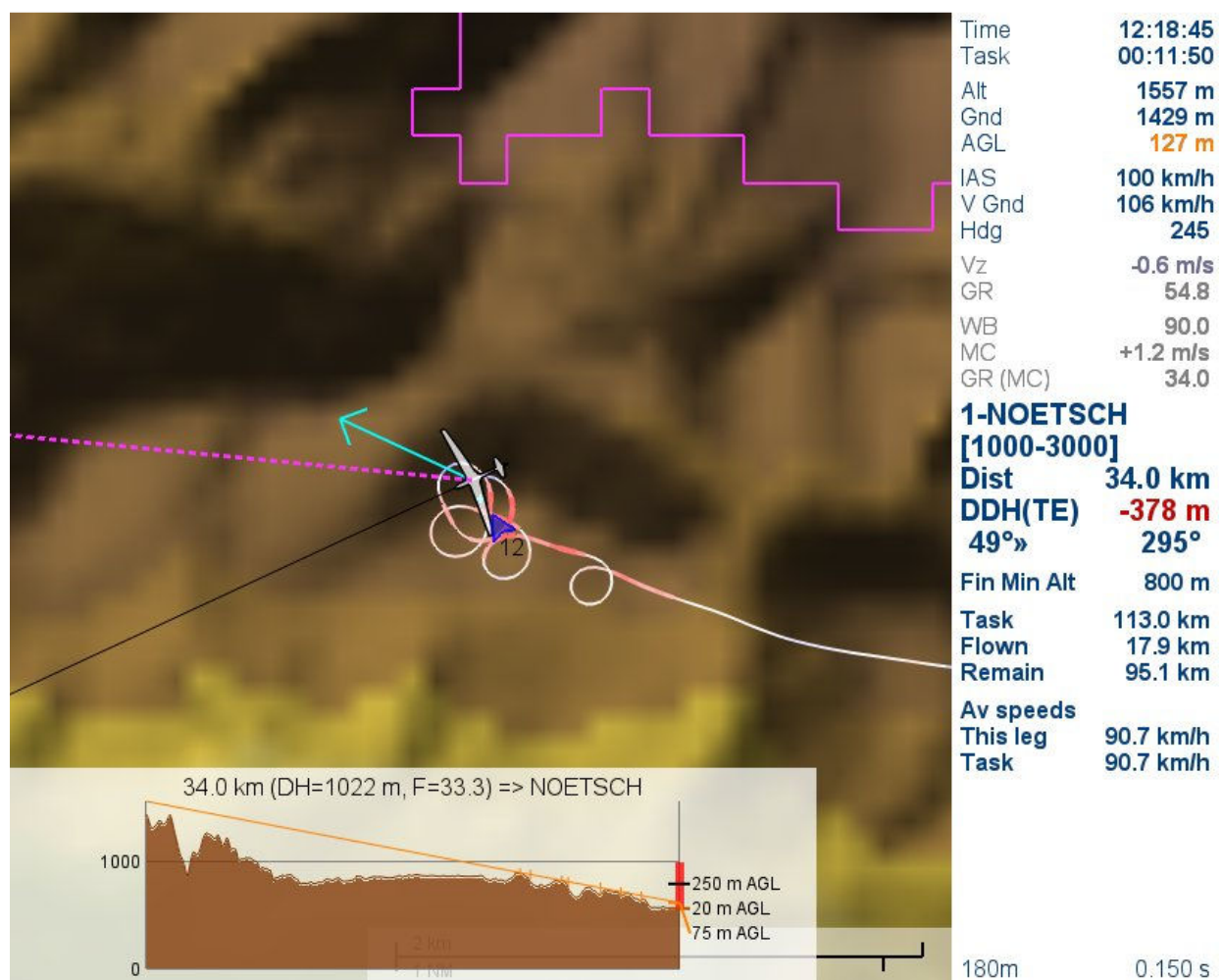
In the CoMoMap.ini file:

Auto Thermal Mode=	0:NO, otherwise VALUE=time (s) to return to thermal mode after selecting another predefined view
Auto Thermal Turn Rate=	Average turn rate to start the automatic thermal mode (def=6°/s)
Auto Thermal Time Constant=	Time constant for integration of the average turn rate (def=15s)

Thermal dots

It is possible to display dots (circles) on the trajectory whose diameter varies with vertical speed, the largest indicating the best climb over the last **N** turns, the smallest the worst.

Dialog box: **Thermal dots: # of turns,** or **Thermal_Dots** in the .ini file

This allows you to refine the centering of strong updrafts where the shades of red can be difficult to appreciate, for example below, where the vertical speed varies greatly between the ends of the arrow, while the colour is almost the same
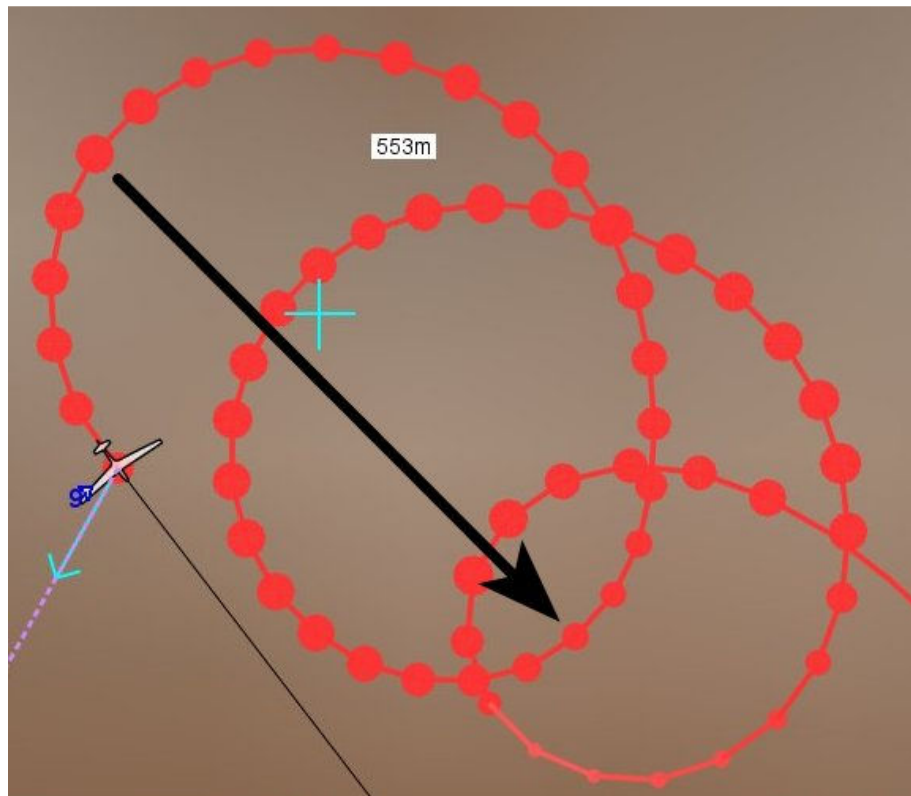
Weather zones

Weather zones can be displayed on the map (dialog box or **Show_WX** in the .ini file)
The outline is displayed with a thick, translucent line, (user defined colour)

If a weather zone is set to move during the task, this motion will be displayed graphically on the map so the glider's position can be seen relative to the any/all moving weather zones at all times. Some weather zones have a transition border some kilometres wide around them. This transition border is not displayed in this version of CoMoMap

The weather data displayed in the FPL information is updated according to the position of the glider.
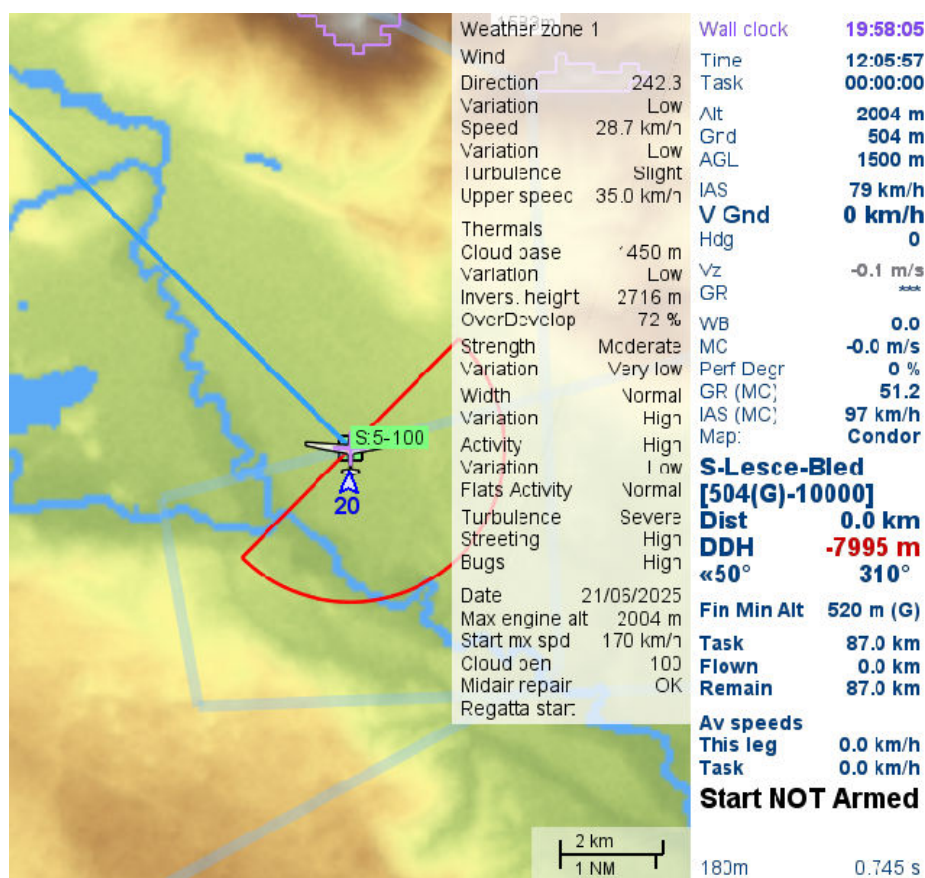 When the glider changes zones, the FPL information is displayed temporarily, showing the zone name

It is possible to cycle through data of the different zones, hit the "**Show FPL**" key while the FPL info box is visible (if the current zone is "Base", you must hit it twice to see #1) The active zone outline is dashed (not shown below)

Airspace and penalty zones

Condor penalty zones are read directly in the flightplan and are automatically detected and displayed.
For Condor3, the landscape airspace file will be used according to flight plan zone selections

For Condor 2, it is also possible to import OpenAir airspace files. In that case, you will have to activate manually detection and display.

Flying through G and GSEC/W classes is not detected.
If one of these zones overlaps with one or more zones of other classes, the latter will be ignored in the overlap zone (see, for example, the exemption corridors of the Ecrins and Vanoise national parks in the French Alps).

If the glider is inside a zone, this zone is ignored when calculating the reachable zone.
The list of detected zones is displayed in the sidebar (see image in the Elevation profile paragraph).

It is possible to display zone information by moving the mouse cursor within the zones or by hovering the mouse cursor on the zone corners or near the middle of the line segments (see below)
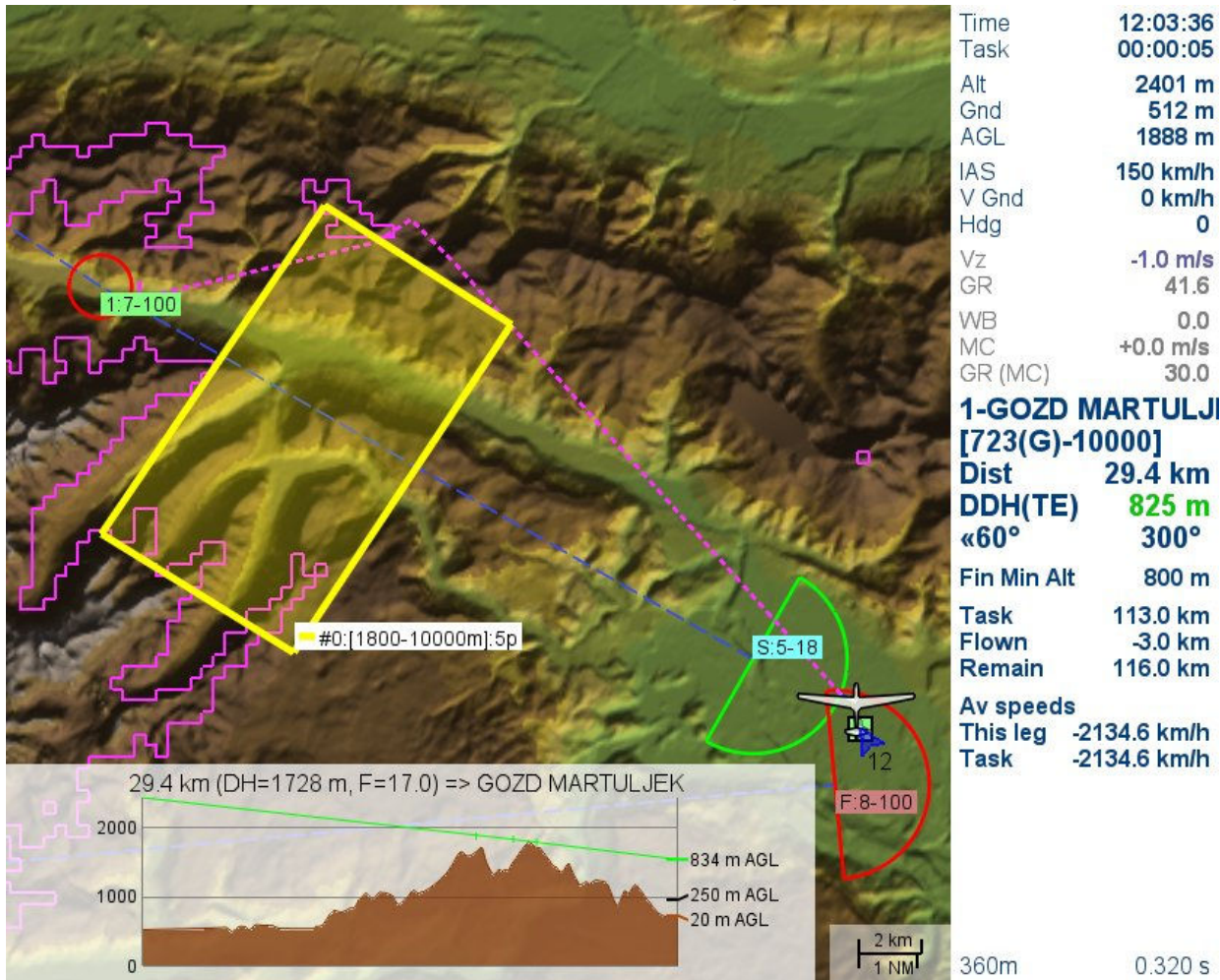
Paths are computed around zones, however there is no possibility to descend in straight line below a zone if it is on the path at a given MC (see profile below)

The yellow zone and the purple line have been hand-drawn to illustrate this
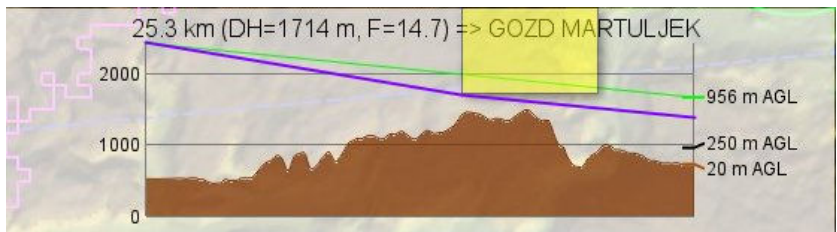
Airspace proximity

Condor detects proximity to airspace, detection distances being 1km horizontally and 100m vertically.
Both distances can be extended in CoMoMap by a factor of up to 5
default=1 - dialog box or **Airspace_proximity_factor** in the CoMoMap.ini file)

The distance to the nearest zone will be displayed in the sidebar, along with the list of zones.

Airspacezone information

Information about nearby airspace zones close to the glider may be displayed on the map while the FPL info box is active ("**Show FPL**" key)
Set **Airspace_info_distance** to the desired value in the **CoMoMap.ini** file (set to 0 to disable)

Airspace pre-computing optimization

If there are large large airspace zones extending outside of the active map, e.g. Germany (C) in AA3 or CTA ZAGREB in Slovenia3, this will strongly increase the pre-computing of airspace when CoMoMap starts.

In order to avoid that, it is possible to simplify the parts extending outside of the active map.
This will have no influence on the airspace detection inside the active map
Set **Simplify_Distant_Airspace=1** in the **CoMoMap.ini** file
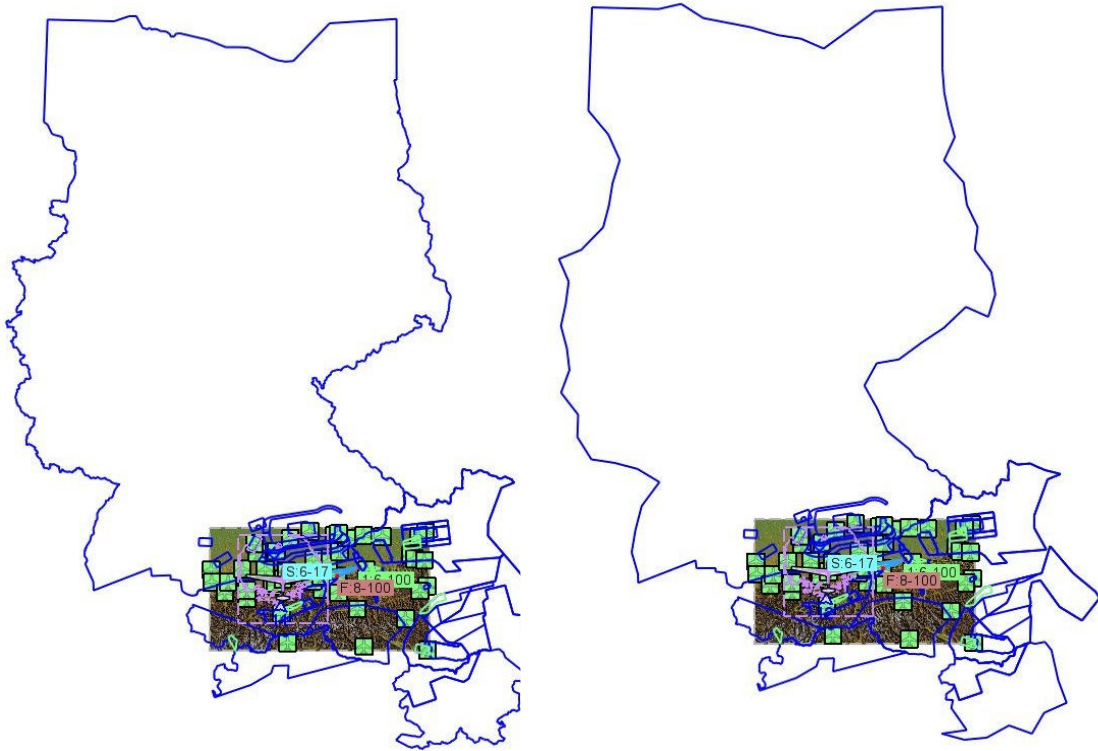
Some (lazy) tasksetters leave all airspace of a landscape active, which can cause **CoMoMap** to use a lot of CPU time testing airspace zones that will never be approached, especially for large landscapes.

It is possible to ignore airspace zones that are outside a rectangle drawn around the task with a user-defined margin : **Max_Task_Margin** in the .ini file

Displaying Cunimb data in the window

To activate/deactivate the display of the other gliders use the tick-box in dialogue box or the relevant parameter in the .ini file

Exclusion and favourites lists can be defined in the .ini file: **Cunimb_exclude** and **Cunimb_favourites**

A single key ("Toggle Cunimb") to scroll through the different displays:
- small icons (CN) (default)
- large icons (CN+altitude)
- small icons (CN) + list sorted by ascending CN on the right of the screen
- small icons (CN) + list sorted by descending CN
- small icons (CN) + list sorted by increasing altitude
- small icons (CN) + list sorted by decreasing altitude
- small icons (CN) + list (reduced to favourites) sorted by ascending CN
- no display

When the list is displayed:
- left-click to centre the view on the glider in question (if it is visible)
- right click toggles the visibility of the glider in question
- double right-click (when one of the complete lists is displayed) adds the glider in question to the Favourites list
- double right-click (when the list of favourites is displayed) removes the glider in question from the Favourites list

You will need to explicitly save .ini file to retain the changes made to the Favourites list.

It is possible to automatically disable the display of tracks when thermal mode is active **Hide_Cunimb_in_Thermals** in the .ini file

Trace length can be set (dialog box or **Cunimb_Max_Points** in .ini file)

Note :
To access the cuminb.net site **CoMoMap** uses **curl** which comes pre-installed in Windows 10 and above
For older versions, you will have to download and install it:
https://curl.se/windows/

For those nostalgic for Condornav

It is possible to have a view in which the glider occupies a fixed position on the screen.
This view is not activated by default.
To activate it and define the position :
- select the centred view
- give the focus to **CoMoMap**
- drag the map so that the glider is in the desired position
- press the "P" key
- the "Fixed Screen Position" view becomes available in the sequence of views.

To change the position of the glider, repeat the above procedure.

INSTALLATION

CoMoMap must be installed in a writeable folder

If you have used previous versions, copy your old CoMoMap.ini file into the installation folder, start CoMoMap, the file will be automatically updated.

Take care not to modify the CoMoMap_default.ini file

The first time it runs, you will have to enable **CoMoMap** in the firewall so that it can get data from **Condor**

If you already use **CoTASA** and/or plan to use **CoKeAs**, the installation folder names must be the default ones without version numbers. After installing the application either rename the **CoTASAVxx** and **CoMoMapVxx** folders so that the names are respectively **CoTASA** and **CoMoMap**, or create junctions: e.g.:
> MKLINK /J CoTASA CoTASAV30

COM port (NMEA data)

CoMoMap will not work if a COM port is not available
It is recommended to use a COM port emulator, such as **VSPE** and to create a pair of ports (e.g. COM6 and COM7). **A basic configuration file for VSPE maybe be found in the distribution**
- one port will be assigned to Condor (SETUP/OPTIONS/NMEA Output, e.g. COM6)
- the other one will be assigned to **CoMoMap** in the **CoMoMap.ini** file)
> # COM Port for NMEA data (COMnumber, default=COM7)
> COM port=COM7

If you want to have more than one application (CoMoMap and eg. XCSoar or LK8000) to use the NMEA data coming from Condor, you will need a port splitter.
This port (COM8 in the pic below) may be shared by all applications needing it

> # COM Port for NMEA data (COMnumber, default=COM7)
> COM port=COM8

Hint : in the VSPE splitter creation window, the source (COM7 here) is on the right-hand side and the destination (COM8) on the left

UDP Port

If CoTASA is already installed :
- it is recommended to install **CoMoMap** in a folder at the same level
- you have to activate the port forwarding in the **CoTASA.ini** file:

> # UDP Port forwarding (default= none)
> Forward Port=55279
> # UDP Port forwarding IP address (default : 127.0.0.1 = localhost)
> Forward Address=127.0.0.1

- and set the same UDP port in the **CoMoMap.ini file**

> # UDP port to listen to (Condor default is 55278)
> Port=55279

If not, use the **Condor** port (default=55278), in the .ini file
> # UDP port to listen to (Condor default is 55278)
> Port=55278

Condor parameters: UDP.ini file
(you can skip this section if CoTASA is already installed and configured)

If both Condor 2 and 3 are installed, the UDP.ini files **must** be identical

If **Enabled** and/or **ExtendedData1** are not enabled in the **UDP.ini** file ((usually located in **C:\Condor2\Settings** and/or **C:\Condor3\Settings)**, it will also try to open it with a text editor in order to modify it.

[General]
> **Enabled=1**   **must be set to 1**
> [Connection]
> Host=127.0.0.1   default = local computer, maybe changed to the IP address of a remote computer
> Port=55278   default value, normally adequate.
> **[Misc]**
> **SendIntervalMs=100**   **100 milliseconds is a good value if no other application is used**
> ExtendedData=0   or any other value you might need
> **ExtendedData1=1**   **Must be set to 1. This line is not present by default in the file. You will have to insert it if needed.**

CoMoMAP will not start until Enabled and ExtendedData1 are enabled

Port forwarding

If another application needs **Condor** UDP data, it is possible to enable UDP port forwarding
In the **CoMoMAP.ini** file, specify the port to which UDP data should be transferred (**Forward Port**) and, if necessary, the IP address (**Forward Address**)

For example :
Condor =>Port 55278=> **CoTASA** =>Port 55279=> **Your application**
Condor =>Port 55278=> **CoTASA** => Port 55279 => **CoMoMAP** =>Port 55280=> **Your application**

If the other application does not allow changing the UDP port number, you will also have to change the Condor output port, for example: **Condor** => Port 55279 => **CoMoMAP** => Port 55278 => **Your application**

The **SendIntervalMs** parameter can be adapted to the requirements of the other application.
CoMoMap can forward data at multiples of about 50ms

SUPPORT

Please report any bugs to: cotaco@marc-till.com , with the **CoMoMap.log** file attached
In case of a reproducible crash, please run the CoMoMap-Log.bat script and also send the **CoMoMap-Log.log file**

ACKNOWLEDGEMENTS

- The NaviCon.dll library is provided courtesy of UBSoft, publisher of Condor, which retains copyright.
- The conversion of image files is done with NConvert from XnSoft:
  https://www.xnview.com/en/nconvert/ - please refer to the license.txt file in the **NConvert** folder.
- The GUI uses components from "tiny file dialogs" under a zlib license
  https://sourceforge.net/projects/tinyfiledialogs/
- The Cpw library is open-source software, licensed under the Lua License.
  https://mathies.com/cpw/about.html

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ANNEXES

Sidebar texts

Wall clock	Computer time
Time	Condor time
Task	Time since crossing the start line
Alt	Altitude
Gnd	Ground elevation
AGL	Height above ground
IAS	Indicated speed
V Gnd	Ground speed
Hdg	Heading
Vz	Vertical speed
GR	Glide ratio (instantaneous)
WB	Water Ballast
MC	MacCready setting
Perf Degr	Performance degradation coefficient
GR (MC)	Glide ratio (calculated according to MC)
IAS (MC)	Transition speed (indicated, in still air) as a function of MC
Map : Wind, etc	Type of map used (wind, relief, sun, Condor)
1-NOETSCH	TP number and name
[499(G)-1800]	altitude limits (G=ground)
Dist	Distance
DDH(TE)	DDH (same as Condor), if (TE): takes into account total energy
« 5° 159°	heading deviation (and direction) and course to follow
Fin Min Alt	Finish Minimum Altitude
Task	Total task distance
Flown	Distance covered
Remain	Distance to go
Av speeds	Average speeds
This leg	Current leg
Task	Whole task

List of toolbar commands

CNDMAP	select CoNDor MAP
DETAS	DETect AirSpace
EXIT	EXIT program
PFDG_M	PerFormance DeGradation -
PFDG_P	PerFormance DeGradation +
GTNXTP	GoTo NeXt Turn Point
MAPS	toggle MAPS
RSTKBD	ReSTart KeyBoarD hook
RSTTSK	ReSeT TaSK
SETUP	SETUP
SHNXTP	SHow NeXt Turn Point
SHOAS	SHOw AirSpace
SHOFPL	SHOw FPL information
SHOKEY	SHOw KEY definitions
SHOPRF	SHOw elevation PRoFile
SHORCH	SHOw ReaCHable zone
SHORGR	SHOw Required GR
SHOTSK	SHOw TaSK
SHPRTP	SHow PRevious Turn Point
THRCNT	THeRmal CeNTer
TOGGTE	TOGGle TE

VIEWS	Toggle predefined VIEWs
Z_IN	Zoom IN
Z_OUT	Zoom OUT

Command line syntax

> CoMoMap [-help][-d|-D][-EN|-FR] [-auto|-wait] [-fma:ALT] [file]

-help	print this
-d	debug mode
-D	debug mode (even more verbose)
-EN	force English
-FR	force French
-auto	start with default Condor flightplan (default)
-wait	start with default Condor flightplan and wait for a more recent version
-fma:ALT	use ALT to override the Condor Finish Min Altitude. "m" or "ft" may be used
File	flightplan file to start with (.fpl)

NOTE: The command line arguments are evaluated after the **CoMoMap.ini** file has been read.

List of files

Manual	Folder containing the manual
NConvert	Folder containing the image conversion utility
AltCol.txt	color palette for relief maps (RGB version)
AltCol_HVC.txt	color palette for relief maps (HVC version)
Changelog.txt	changes logfile
CoMoMap.exe	application
CoMoMap.ini	configuration file
CoMoMap_default.ini	configuration file template **(do not modify)**
CoMoMap-Basic-Config.vspe	basic configuration file for VSPE
CoMoMap_LISEZMOI.txt	French version of this file
CoMoMap_README.txt	this file
CoMoMap_Setup.exe	configuration application
CoMoMap_Setup_form.frm	form definitions (EN)
CoMoMap_Setup_form_FR.frm	form definitions (FR)
CpwDLL.dll	graphic library
Polars_data.txt	Condor glider data
Polars_data.txt__LAST_CHECK.txt	last check date of above file **(do not modify)**
silhouette.txt	glider silhouette
zlibwapi.dll	Zlib library

Optimisation of calculations:

The calculation of the reachable area is done in the background, if the calculation is long (>0.5 s), the grid size will be doubled (maximum=720m), it will be halved below .125 s (minimum=90m)
The computing time is displayed in the lower right corner of the window, together with the grid size

For very large maximum reachable area sizes, if computing time becomes too high, it is possible to accelerate the calculation of the reachable area if your PC is powerful enough and has enough cores to perform parallel computations.

NOTE: IF THE CALCULATION TIMES ARE LESS THAN 1 SECOND, DO NOT ACTIVATE IT

In the .ini file: Number_of_threads=VALUE
The gain is negligible above 4
The recommended maximum value is 4 on powerful PCs (core-i9 or similar), 2 or even 1 if there is a degradation of the performance of other applications

AltCol.txt file templates

The first line indicates the color reference frame used: [HVC] or [RGB]

Colors are defined by triplets:
- RGB: [0-255.0-255.0-255]
- HVC (Hue, Value, Chroma ~ Saturation) [0-360,0-100,0-100]
On each line, the maximum altitude of the slice (in m) and the corresponding colour triplet
Values are read in free format and can be separated by spaces, tabs or commas

It is recommended to make a backup copy of this file before making any changes

RGB sample :	HVC sample :

<pre>[RGB]
    0 128 242 230
    2   9 90 14
   50   0 102   3
  110 22 118 11
  185 66 141 38
  360 115 173 63
  550 165 203 94
  700 187 200 84
  820 230 210 97
  950 222 194 69
 1160 170 131 64
 1450 150 114 66
 1650 135 102 69
 2000 139 105 70
 2200 158 128 78
 2450 165 149 133
 2700 184 168 153
 2900 197 192 188
 3150 212 211 207
 3400 221 221 221
 3700 233 233 233
 4000 242 242 242
 4500 226 241 238
 5000 219 241 238
 5500 221 237 237
 6000 192 211 243
 6500 180 183 224
10000 180 183 224</pre>
	<pre>[HVC]
	    0 280 81 27
	    2 243 22 18
	   50 242 24 23
	  110 236 30 23
	  185 226 42 19
	  360 212 56 18
	  550 197 70 17
	  700 176 72 19
	  820 156 80 22
	  950 154 74 26
	 1160 139 53 18
	 1450 135 47 15
	 1650 130 42 12
	 2000 130 44 12
	 2200 139 52 14
	 2450 130 60 6
	 2700 129 67 6
	 2900 126 76 2
	 3150 152 83 1
	 3400 0 87 0
	 3700 0 91 0
	 4000 0 95 0
	 4500 276 93 3
	 5000 278 92 5
	 5500 284 91 4
	 6000 319 82 9
	 6500 343 73 8
	10000 343 73 8</pre>