VerifLocal

User's Guide

Contents

VerifLocal

VerifLocal is a software that analyzes IGC flight recordings or files coming from the Condor simulator (**.ftr**). It allows to check whether the glider has remained within gliding range of Landable Areas (LA) during the flight (according to a Glide Ratio) and can determine escape routes.
The name comes from the French gliding expression : “rester en **local“: “**remain within gliding range”

RECOMMANDATIONS

This software is provided "as is" without any express or implied warranty. In no event shall its authors be liable for any damages whatsoever resulting from its use. The results provided are only indicative and cannot be used as proof.

The use of this software should in no case exempt the user from using his common sense.

As wind and aerology are not taken into account, it is recommended not to modify the default heights and safety coefficients which correspond to the values commonly used.

Glide Ratio :

- for IGC files, the default Glide Ratio used for computations is 20. If the glider type is clearly identified (the type indications in the IGC files are not always reliable) one can use half of the maximum Glide Ratio, otherwise it is recommended to keep the default value of 20 (or even less for "wood-and-fabric" ones), possibly 25 for 15m or 18m classes and above;
- for flights coming from Condor, if the option **[Parameters/Condor: automatic glide ratio**] is activated, the calculation glide ratio will be equal to half of the maximum glide ratio of the glider in question (defined in the Glider_data.txt file); otherwise, the default calculation glide ratio will be used.

Escape routes

Tracks towards LAs are shown only as a means of verifying their existence. If there are several, the selection of the one shown is made on arbitrary criteria (see below), so there is no guarantee that the track displayed is the best one. They can therefore only be recommended for actual flights after a thorough check.

Language and Units

The software detects if the computer uses French; otherwise English will be used.
It is possible to force French or English if needed (see below ADVANCED USE)

For the time being, the software uses only metric units (meters, kilometres)
Support for Imperial or Australian units could be added at a later stage.

USAGE

Only Condor Version 2 is supported

It is possible to read Condor **(.ftr)** or IGC **(.igc)** files, whether they come from **real or simulated** flights. During the same session it is possible to read both types of files.

Flights recorded in IGC files must be contained entirely in the area corresponding to the topography file **(.trn)** specified in the configuration file **VerifLocal.ini,** section **`[TrnFile]`**.

This file can also be specified interactively, see below: **Menu/Terrain(IGC)** . The file must be have been selected before you open the flight recording.

The displayed map can also be modified, see below: **Menu/Map(IGC)**

For more details, see § **TOPOGRAPHICAL DATA AND MAPS** below.

For Condor files, the landscape on which they have been recorded is automatically selected if it is installed on the computer, otherwise the same **.trn** file will be used as for IGC files.

For each flight recording, the program will check if the glider is within gliding range of the Condor airfields (.**ftr** files only), as well as the Landing Areas (LA) defined in one or more **.cup** files (SeeYou format).
The list of these files must be in the configuration file VerifLocal.ini (see paragraph PARAMETERS configuration **.ini** file).

The program will try to detect the release at the end of the towing or winching operation as well as the entry into the landing circuit (2 km ~1.1NM from the landing point or cone of GR=10). For flight recordings from Condor, engine operation is also detected.

For the duration of the flight, the program will check (by default every 20 seconds) the possibility of gliding to a LA, in a straight line or in a broken line according to the glide ratio (see below) while respecting a safety height at arrival (300m ~1000ft by default).

Escape routes

The program constantly checks whether the clearance path remains above the relief (with a safety margin of 150m ~500ft by default). If the starting point of the clearance path is below the safety height above the terrain, the glider will try to deviate from the terrain along the line of greatest slope.

Escape routes are first searched for in a straight line and then, if no straight line escape route is found, in a broken line, trying to find a path to reach a LA.

The algorithm searching for escape routes in a broken line is not optimal and does not necessarily find all the possible ones (for the time being, it does not know how to fly backwards).

However, we do not consider this to be essential, as the broken line escape routes only serve to eliminate a few "false positives" that a careful observation of the map would detect anyway.

"False negatives" are excessively unlikely because the height above ground of the clearance paths is very finely determined (every 90m ~100yds = horizontal resolution of the topographic data).

It is possible to display clearance paths periodically (see below): only 1 clearance at each point of the path, in the direction of the LA:

1. the nearest one that can be reached above safety height (**green** on the map) ;
2. otherwise, the LA that can still be reached with the highest arrival height below safety height (**orange**) ;
3. alternatively, the trajectory towards a theoretically reachable LA: among all the escape routes that would allow to reach a LA in the absence of relief and which are blocked by the relief, the one that will come closest to the targeted LA (**red**).

INTERACTING WITH THE SOFTWARE

Start

To open a file, select **File/Open...** from the menu.
If you want to use drag and drop mode to start the program, it is recommended that you create a shortcut on your desktop. You can then drag a file (**.igc** or **.ftr**) onto the shortcut to scan it.

Display

Map :

At start-up the map is displayed on the whole window.

Note : The map and barograms header pictures have been taken directly from the French version of the manual but should remain understandable

The colour of the trajectory represents:

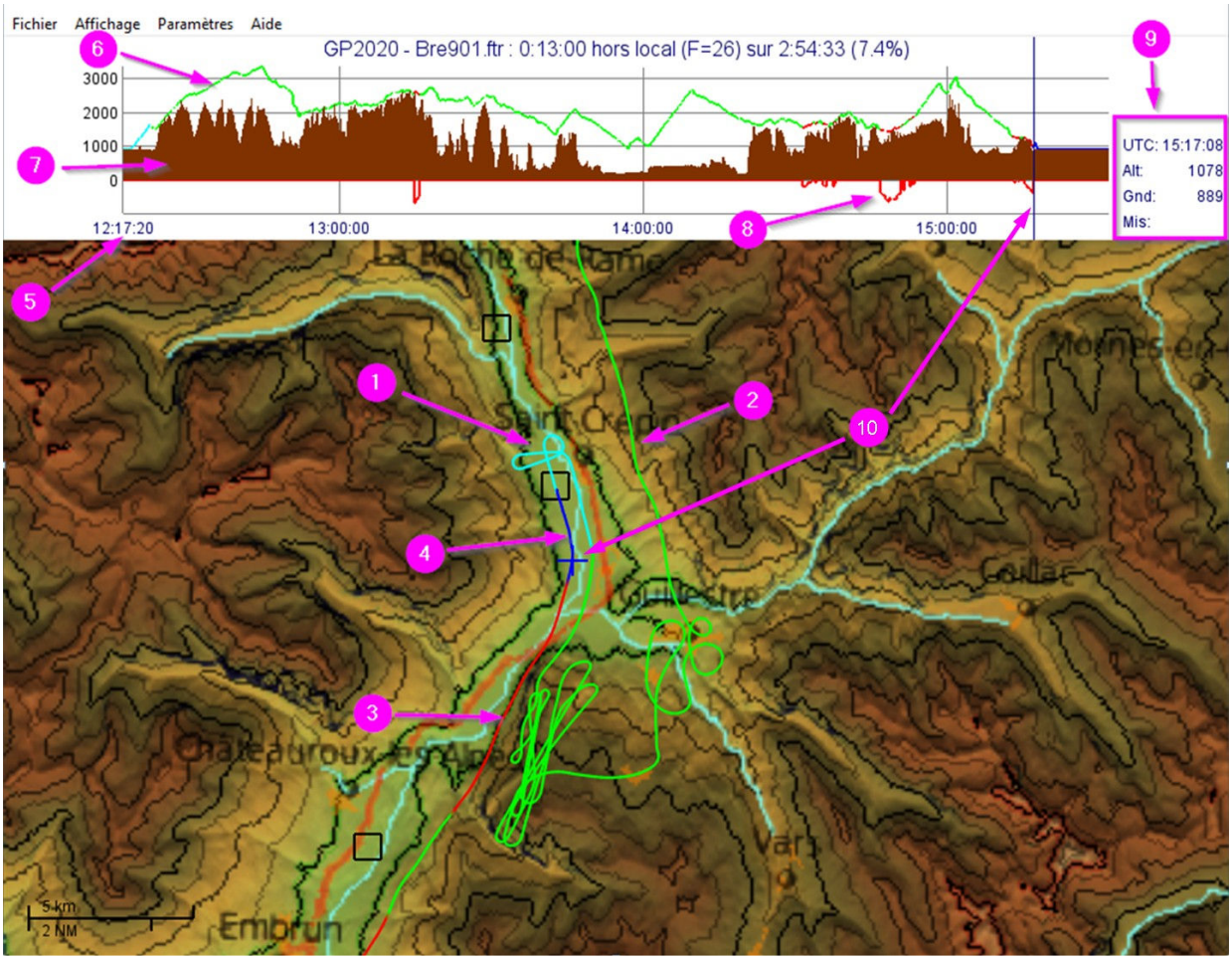
1. **Cyan :** initial climb (tow, winch or motor start)
2. **Green** : the glider is within gliding range of a LA
3. **Red** : the glider is not within gliding range of a LA
4. **Blue :** landing circuit.

Barogram :

It is located above the map or on the full page (see Display menu).

You can see:

5. Time (UTC, abscissa) ;
6. the altitude of the glider (top curve, same colors as the trajectory on the map);
7. ground elevation (**brown**) ;
8. downwards (always **red**) the height missing to be within gliding range of a LA (straight line only) ;
9. information (5, 6, 7 and 8) condensed for the active point;
   - **UTC :** time
   - **Alt :** altitude
   - **Gnd** : ground elevation
   - **Mis :** missing height
10. The active point is represented by a vertical blue line on the barogram and by a blue cross on the map..



The text above the barogram indicates:

1. file name ;
2. time spent outside gliding range of LAs (=“hors local”) (duration);
3. Glide Ration used for the calculation (F=**GR**, below : 20);
4. safety height on arrival (DH=**HHH**/ggg, below : 300);
5. minimum height above ground level (DH=hhh/**GGG**, below : 150);
6. if applicable, if the calculation was made with altitude corrected for kinetic energy (TE);
7. total flight time;
8. time spent outside gliding range (percentage).

When the map and the barogram are displayed simultaneously, if the mouse is moved over the barogram, a cross indicates the position of the glider on the map (active point) and details are displayed to the right of the barogram.

If you click on the barogram with the left mouse button, the map is centered on the corresponding position.

If the mouse cursor is placed on the trajectory, the index of the barogram is positioned at the corresponding moment.

It is also possible to activate the automatic centering of the map (in the Display menu).

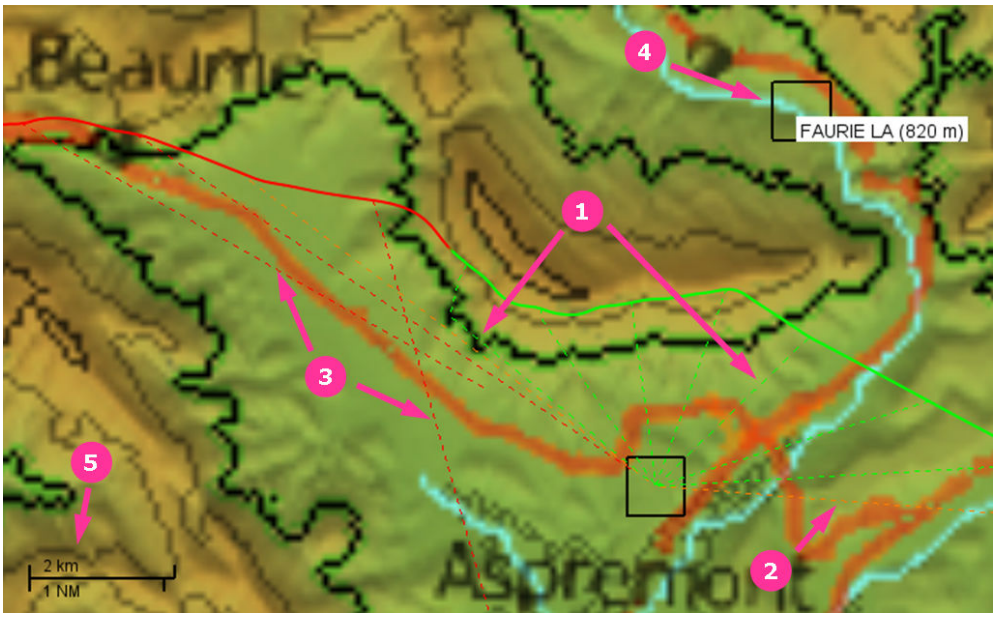
Clearance paths

The clearance path displayed (dotted lines) is in the direction of the LA:

1. nearest one that can be reached above safety height (**green**) ;
2. otherwise, the one that can be reached with the highest arrival height below safety height (**orange**) ;

3. or, alternatively, the trajectory towards a theoretically reachable LA that will come closest to it (**rouge**).

   If no LA is theoretically reachable, no clearance path will be displayed.



Miscellaneous information

4. If the mouse passes over a ZA (black square) the corresponding name and elevation are displayed.
5. The scale in the lower left corner is automatically adjusted (value or line length)

Zoom and Pan

The map can be moved by clicking and dragging it with the left mouse button.
It is possible to zoom in and out:

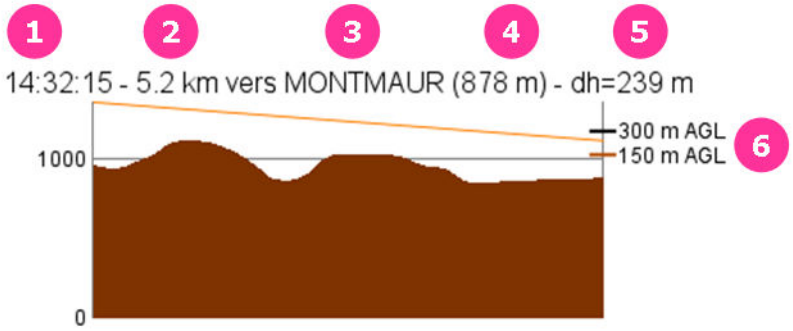
- by clicking on the middle mouse button and moving it vertically ;
- by using the mouse wheel;
- by using the keyboard shortcuts [CTRL][+] and [CTRL][-] (numeric keypad).

You can return to the initial zoom by using the keyboard shortcut [CTRL][*] (numeric keypad).
You can restore the original view by using the keyboard shortcut [CTRL][HOME].

Escape routes altimeter profiles

When escape routes are displayed, right-clicking on a track brings up the corresponding altimeter profile in the lower left corner of the map. The profile disappears when the button is released. The colour of the track is the same as on the map (**green**, **orange** or **red**).
It reads :

1. time corresponding to the starting point on the trajectory;
2. distance flown (in a straight or broken line) ;
3. name of the LA reached (or targeted);
4. elevation of the LA reached (or targeted);
5. if the LA is reached, the height above the ground at arrival;
6. a graphical indication of the safety heights on the vertical axis to the right.



FILES CREATED

At each run, a summary of the results will be added at the end of the **VerifLocal.log file** that will be created if it does not yet exist.

For each flight recording processed, a summary is written in the same folder and named **name_SUMMARY.txt**.
It contains a reminder of the main parameters (glide ratio and safety heights), as well as the times and positions of the entries and exits of "within gliding range":

```
Local OK            12:08:52        44°02'32"N   005°58'33"E     1115m
Sortie local        12:47:55        44°12'05"N   005°54'09"E     1118m
```

Modified IGC files

The software does not allow 3D visualization.

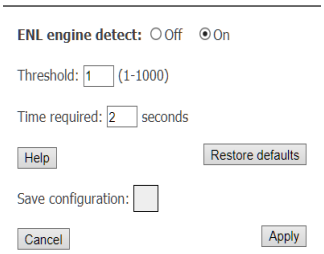
If desired, or for archiving purposes, it is possible to save modified IGC files in which a fictitious indication of engine operation is inserted, equal to the height missing to be within gliding range, clipped to 900m ~2900ft (if it is null, the glider within gliding range)

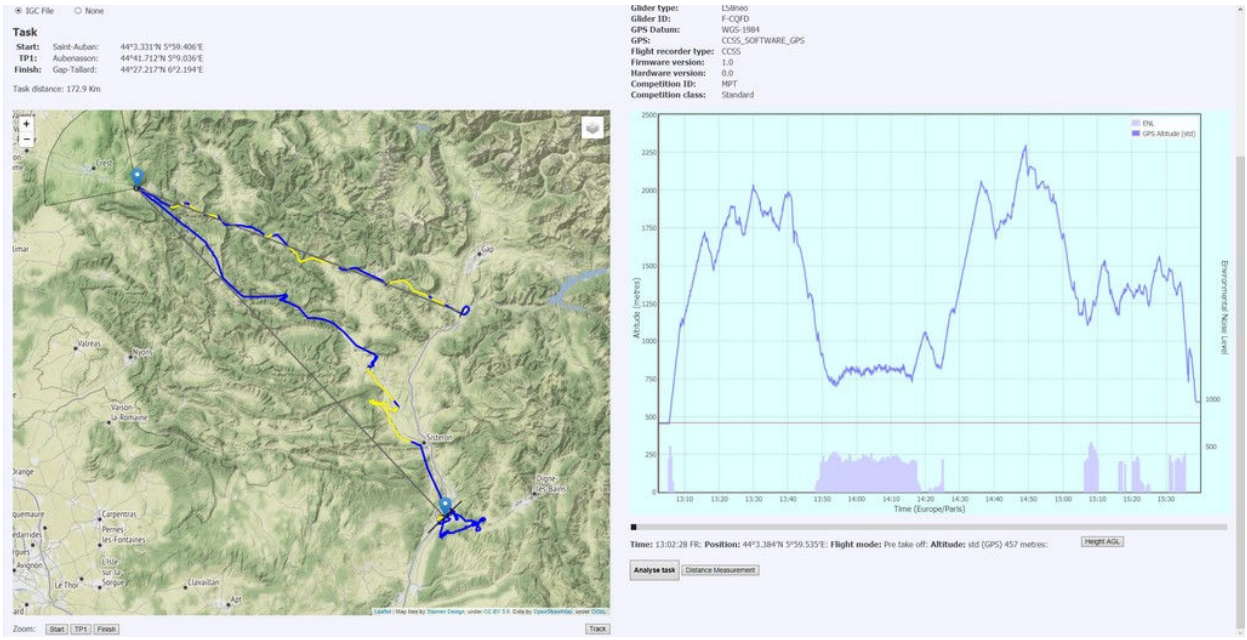
The trajectory alone will be recorded in a file named **name_LOCAL.igc.**
If the escape routes are displayed, they will be added to the trajectory and the file name will be **name_PATHS.igc.**
To be fully usable, these files must be viewed with software or on a website that takes into account engine operation.

This is possible, among others, with SeeYou (select "Engine noise level" to colour the trajectory).

On line, it is also possible on the https://igcviewer.bgaladder.net website

The engine operation detection must be activated with the following parameters:





MENUS

If a menu item corresponds to a parameter defined in the **VerifLocal.ini** file, the name and possibly the value are indicated between square brackets. **[name=value]**

File/Open IGC or Condor file…

Opens an IGC or **.ftr** file (Condor flight track) and determines whether the glider remained within gliding range and the escape routes according to the options selected.

File/Re-compute

Determines whether the glider remained within gliding range and the escape routes according to the options selected.

File/Enregistrer le File IGC modifié…

Opens a selection window for the modified IGC file (see above)

File/Quit
Ends program execution

Config./ Terrain (IGC)
Allows you to change the topographic data file **(.trn)** used for IGC files.
If it exists, the default map (**name.bmp**) will be selected; otherwise the user will be prompted to select one that must match the defined topography **(.trn**) file.
The file change will only be taken into account when the next file is opened.

Config./Map (IGC)
Changes the map (**.bmp**) used for IGC files.
The selected map must match the topography **(.trn**) file defined.
The map change will only be taken into account when the next file is opened.

Config./Add CUP file
Allows you to add a **.cup** file to the list (10 max)
It is not possible to remove a file from the list; it must be done directly in the configuration file.

Config./Save config.
Saves the current configuration in the **VerifLocal.ini** file.
The previous version is renamed to **VerifLocal.ini.bak.**

Config./Save config as….
Saves the current configuration to another file.
If the file does not yet exist, you have to enter the file name: **my_file**
The **.ini** extension will be automatically added to the filename if not specified.
If it exists, the previous version is renamed to **my_file.ini.bak**

Config./ Load config. …
Loads the configuration from a file.
The parameters will be taken into account when the next file is opened.

Display/Tracks towards Landable Areas
Toggles the display of escape routes on the map. **[Show_paths]**
Click on File/Re-compute to refresh the display if the "Automatic re-compute" option is not enabled.

Display/Change current map
Allows you to select an alternative map
This map will not be saved in the configuration.
The selected map must match the selected Condor landscape or the topography file (.**trn**) defined for IGC files.

Display/Map
Selects the display of the map only
The default display mode can be set in the **.ini** file [**Display_map=1]**

Display/Barogram
Selects the display of the barogram only [**Display_map=2]**

Display/Les deux
Selects the display of both map and barogram [**Display_map=3]**

Affichage / Auto. center
Toggles the auto centring mode: the map is automatically centred on the position of the glider when the simultaneous display of the map and the barogram is active.

Parameters/Glide Ratio

Allows to change the glide ratio used for calculations (see §RECOMMENDATIONS). **[Working_L/D]**
Warning : this value does not correspond to the maximum glide ratio of the glider.
Allowed values : [5-99]
The glide ratio value will be displayed in the information bar of the barogram (F=GR).
Click File/Re-compute if necessary to refresh the display.

Parameters/Condor: automatic glide ratio

Toggles the automatic glide ratio determination for Condor flight recordings
If the option is not activated, the glide ratio will be the default glide ratio or the one defined by the user.
Changing this option will only be taken into account when the next file is opened.

Parameters/Safety height at arrival

Allows you to change the minimum height at the finish (in meters) **[Safety_height]**
Minimum value: 200m (~650ft)
The value will be displayed in the information bar of the barogram **(DH=HHH/ggg)**
Click File/Re-compute if necessary to refresh the display.

Parameters /Minimal ground clearance

Allows you to change the minimum height at the finish (in meters) **[Ground_clearance]**
Minimum value: 50m (~160ft)
The value will be displayed in the information bar of the barogram **(DH=hhh/GGG)**
Click File/Re-compute if necessary to refresh the display

Parameters/ Automatic re-compute

Enables or disables automatic re-calculation

Parameters/Total Energy

Toggles the use of altitude corrected by kinetic energy
If this option is enabled, it will be displayed in the barogram information bar **(TE)**
Click File/Re-compute if necessary to refresh the display

Parameters /Computing frequency

Allows you to change the calculation frequency (in seconds) **[Time_step]**
Minimum value: 10s
Click File/Re-compute if necessary to refresh the display

Parameters /Track display frequency

Changes the frequency of the display of the escape routes (every N calculations) **[Paths_frequency]**
Minimum value: 1
Click File/Re-compute if necessary to refresh the display

Aide/ Manual

Opens the manual with the default software for PDF files

Aide/ About…

Displays version number

PARAMETERS : configuration file (.ini)

Most parameters can be changed interactively.

It is possible to save the configuration if it has been changed.
It is possible to save the configuration in another file, which allows, for example, to work on different areas.
It is possible at any time to reread a configuration file (the parameters will be taken into account when the next file is opened).

All parameters that can be modified are defined in the **VerifLocal.ini** file and can also be changed by editing this file with a text editor (Notepad or other).
Comments (#) in the file are self-explanatory.

An example file is in the appendix.

- Display_map : default display mode (default : both map and barogram)
- Time_step : periodicity of the checks (20 seconds by default)
- Paths_frequency : periodicity of the display of clearance paths (default : 2)
- Show_paths : display of clearance paths (default: 0=NO)
- Safety_height : safety height on arrival at the LA (default: 300m ~1000ft)
- Ground_clearance : minimum height above ground (default:150m ~500ft)
- Working_L/D : glide ratio used for computations (default: 20)
- L/D_Sfty_Fact : glide ratio safety coefficient **only for Condor** (default : 50%)
- TrnFile : topographic data file (only for IGC files, extension: **.trn**)
- MapFile : map file name (only for IGC files, extension: **.bmp**)
- CupFile : Landable Areas file(s) (SeeYou format, extension: **.cup,** max 10 files)

TOPOGRAPHIC DATA AND MAPS:

In the case of the Condor files we will obviously use the data and maps of the Condor landscapes (based on SRTM data with a mesh size of 90m ~100yds).

For the time being these data and maps will also be used for IGC files, without the need for Condor to be installed on the computer.
For the Alps, the **AA2.trn** file and the **AA2.bmp** map can be provided in the distribution

This data is of course provided without any guarantee of accuracy of any kind, but, given the number of Condor flights already made over this entire landscape, the accuracy can be considered more than correct.

If Condor is installed on your PC, start **VerifLocal** and click on [**Config./Terrain(IGC)]** in the menu bar and select the file **AA2.trn** which is located in **C:\Condor2\Landscapes\AA2** (if Condor is installed in **C:\Condor2**).
The default map will be automatically selected.
Then click on **[Config./Save config.]** if you want to memorize this configuration.

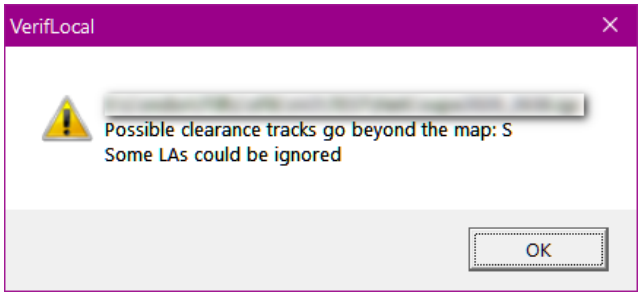
For other zones, obtain the **.trn** and **.bmp** files of the Condor landscape corresponding to the flight zone and proceed in the same way.

The easiest way is to download the "basic" package of the corresponding Condor landscape from Condor Club: https://www.condor-club.eu/sceneries/197/.
For a given landscape, it is always the first one in the list of files to download.
Unzip the file at the desired location. It is then possible to delete all files except:
LANDSCAPE_NAME.trn and **LANDSCAPE_NAME.bmp**

Note: take care to use only landscapes intended for Condor version 2 ("**C2**" must appear before the name of the landscape in the list)

Flights must be contained entirely within the area corresponding to the topography file.
If they straddle two landscapes, they cannot be processed.

If a flight takes place close to the limits of the landscape, the software will not take into account LAs that are off the map but which could theoretically be reached (given the maximum altitude of the flight). This message will be displayed:



.CUP FILES

These files are specific to each zone and must be provided by the user.
They are in SeeYou format: http://download.naviter.com/docs/CUP-file-format-description.pdf

It is not recommended to use the Condor landscape .cup files because they do not generally contain Landing Areas and the quality of the data is very variable.

Only the LAs (airfields or fields) are taken into account. Duplicates are eliminated. Latitude and longitude are used; the elevation will be that of the ground at the point considered (to ensure consistency of calculations).

For the French Alps it is advised to use the file provided by the FFVP: **GUIDE CHAMPS FFVP 2019.cup**, provided in the distribution. For the Alps in general, and a little beyond, the AAPCA (Fayence) has put a very exhaustive file online: https://www.aapca.net/venir-voler-a-fayence/carte-vac/

For "real life" use, it is possible to use the program to systematically check the elevation of the Landing Areas defined in the files (see ADVANCED USE below).

AVANCED USE

It is possible to launch the program from a command window or from a script.
The syntax is:

```
>   VerifLocal  [-help][-d|-D][-EN|-FR][-f :FINESSE][-chk][-geojson] [file]
    -help           displays the list of options
    -d              debugging
    -D              very verbose debugging
    -EN             forces the use of English
    -FR             forces the use of French
    -f:GR           defines the Gliding Ratio used for calculations
    -chk            checks the elevations in the .cup file(s)
    -geojson        generates a .geojson file with the tracks
    file            name of the file to be processed (.igc or .ftr)
```

Checking CUP file elevations

If the -chk option is activated, no flight recording will be processed and the software will compare the elevations of the LAs contained in the **.cup** file(s) with the ground elevation defined in the **.trn** file.

If the difference is more than +/- 50m (~160ft), the name of the LA and the corresponding elevations will be written in a file named **NAME.csv** (if the file is named **NAME.cup**).

SUPPORT

Please report any problems to: cotaco@marc-till.com

ACKNOWLEDGEMENTS

Many thanks to Yannick Burgevin for the numerous tests he performed as well as for the precious advice he gave for the development of the GUI and the writing of the documentation.

The graphical interface uses components of "tiny file dialogs" under a zlib license.
https://sourceforge.net/projects/tinyfiledialogs/

The Cpw library is Open Source software, under the Lua license
https://mathies.com/cpw/about.html.

The NaviCon.dll library is provided courtesy of UBSoft, publisher of Condor, which retains copyright.

The topographic data and the map of the Alpine Arc are provided courtesy of Dgtfer, creator of the Arc Alpin 2 (AA2) Condor landscape.

DISCLAIMER

APPENDIX : VerifLocal.Ini sample file

```
# Paramètres pour la vérification du respect du local des Zones Atterissable
# les lignes vides ou commençant par # ne sont pas prises en compte
# en l'absence de valeurs, on utilisera la valeur par défaut (def=)

# Parameters for landable zones reachabililty check
# blank lines or beginning by # are ignored
# if no value specified, the default value (def=) will be used

# Affichage : 1=carte, 2=baro, 3=les deux
# Display map : 1=map, 2=barogram, 3=both
# def=3
Display_map=3

# vérification toutes les ...
# check every ...
# sec., [1-120], def=20
Time_step=20

# calcul des trajectoires de dégagement toutes les ... vérifications
# compute escape routes every ... checks
# def=2
Paths_frequency=

# affichage des trajectoires de dégagement
# display escape routes
# [0/1], def=0
Show_paths=0

# Hauteur de sécurité à l'arrivée
# Safety height at arrival
# metres, >200, def=300
Safety_height=300

# Hauteur minimale au dessus du sol pendant le dégagement
# Minimum height above ground during flight towards landing
# metres, >50, def=150
Ground_clearance=150

# Finesse de travail
# Working L/D
# [5-99], def=20
Working_L/D=20

# Coefficient de sécurité sur la finesse lue dans le fichier (Condor seulement)
# L/D safety factor when read in file (Condor only)
# %, [10-100], def=50
L/D_Sfty_Fact=50

# Fichier de données topographiques (uniquement pour fichiers IGC)
# Topographic data file(only for IGC files)
TrnFile=AA2.trn

# Carte (uniquement pour fichiers IGC)
# Map (only for IGC files)
MapFile=AA2.bmp

# Fichier(s) de Zones Atterissables (format .cup SeeYou, maxi 10 fichier)
# Landable Zones file(s) (SeeYou .cup format, 10 files max)
CupFile=GUIDE CHAMPS FFVP 2019.cup

# Path to Condor installation folder (if registry cannot be read)
# Chemin d'accès au dossier d'installation de Condor (si le registre ne peut être lu)
Condor 2 path=C:\Condor2
```