CoTASA : User's guide

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Contents

CoTASA : COndor True Air Speed Alarm V2.1

CoTASA is a program which computes True Air Speed (TAS) from the data sent by **Condor** (Indicated Air Speed and altitude), assuming either the ISA standard atmosphere model or the **Condor** built-in model, and sounds an alarm above a pre-set threshold.
Optionally, a simplified artificial horizon, the water ballast content and the Netto variometer may be displayed. It also features a long-time integrator variometer and a stopwatch. For flapped gliders it also shows the actual flaps setting and trend according to IAS, wing loading and load factor

It only works with **Condor** version 2 (for **Condor** 1, use version **CoTASA** 1.1)

INSTALLATION

Condor should be configured in "windowed" or "fullscreen emulation" (SETUP / GRAPHICS tab) so that the **CoTASA** windows always remain on top on the screen.
If Condor is configured to run in "fullscreen" mode, you will have to manually bring the **CoTASA** windows to the foreground once **Condor** has started (and maybe from time to time).

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

The program will automatically detect if and where **Condor** is installed.

If a new **CoTASA** installation is detected, it will open a dialog box so that you may fill in the access path to the current pilot's folder, usually: **C:\Documents\Condor\Pilots\YOUR_NAME**

If an older version of **CoTASA** is present, the existing **CoTASA.ini** file will not be replaced, **CoTASA** will update it with default values, and it will open it in a text editor.

If **UDP** and/or **ExtendedData1** are not enabled in the **UDP.ini** file (usually located in **C:\Condor2\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.**

CoTASA will not start until Enabled and ExtendedData1 are enabled

If another application needs **Condor** UDP data, it is possible to enable UDP port forwarding: specify the port to which the UDP data must be forwarded (and, if needed, the IP address) in the **CoTASA.ini** file.
For example : **Condor** =>Port 55278=> **CoTASA** =>Port 55279=> **Your application**
If your application does not allow changing the UDP port number, you will also have to change the output port of Condor, for example: **Condor** => Port 55279 => **CoTASA** => Port 55278 => **Your application**

The **SendIntervalMs** parameter can be adapted to the requirements of the other application.
CoTASA can forward data at multiples of about 25ms

LANGUAGE SUPPORT

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

The language of the messages can also be modified by changing the value of the **Language** parameter in the **CoTASA.ini** file. For the time being only English (EN), French (FR) and German (DE- Many thanks to Ikarus) are supported.
If you wish, it is possible to add other languages: just create a new file (for Dutch it should be **CoTASA_Lang_NL.txt**) by translating one of the existing files (**CoTASA_Lang_EN.txt** or **CoTASA_Lang_FR.txt**) and adding the corresponding language (Dutch =NL) in the file **CoTASA_Lang_List.txt**

Thanks in advance to the translators!

USAGE

All the settings can be modified by editing the **CoTASA.ini** file (see below in the Files section).
It can be edited anytime when **CoTASA** has focus by hitting the **"E"** key.

CoTASA can be run on the local computer or on a remote one.

However, running on a remote computer requires some IT expertise because **CoTASA** cannot automatically determine the path to the "**Pilots**" folder that will need to be written manually in the **CoTASA**.ini file. In addition, you should also edit the Windows registry so that **CoTASA** can find the **Condor** installation folder. Read access to **Condor** files on the computer on which **Condor** is running is required.

It may be started by double clicking the icon or from a console window.The command line syntax is :

> **CoTASA_GUI.exe [-help] [-kmh|-kph|-mph|-kts|-fpf]**

-help	displays the command line syntax,
-kmh or **-kph**	velocities in km/h (default)
-mph	miles per hour
-kts	knots
-fpf	furlongs per fortnight (thousands of)

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

For practical reasons it is recommended to start **CoTASA** before **Condor**, but it is possible to start it at anytime

CoTASA waits for **Condor** to start and then reads files: **Flightplan.fpl, controls.ini** and **Setup.ini** in the current pilot's folder in order to determine the glider type, the ballast (fixed & water) and some settings.
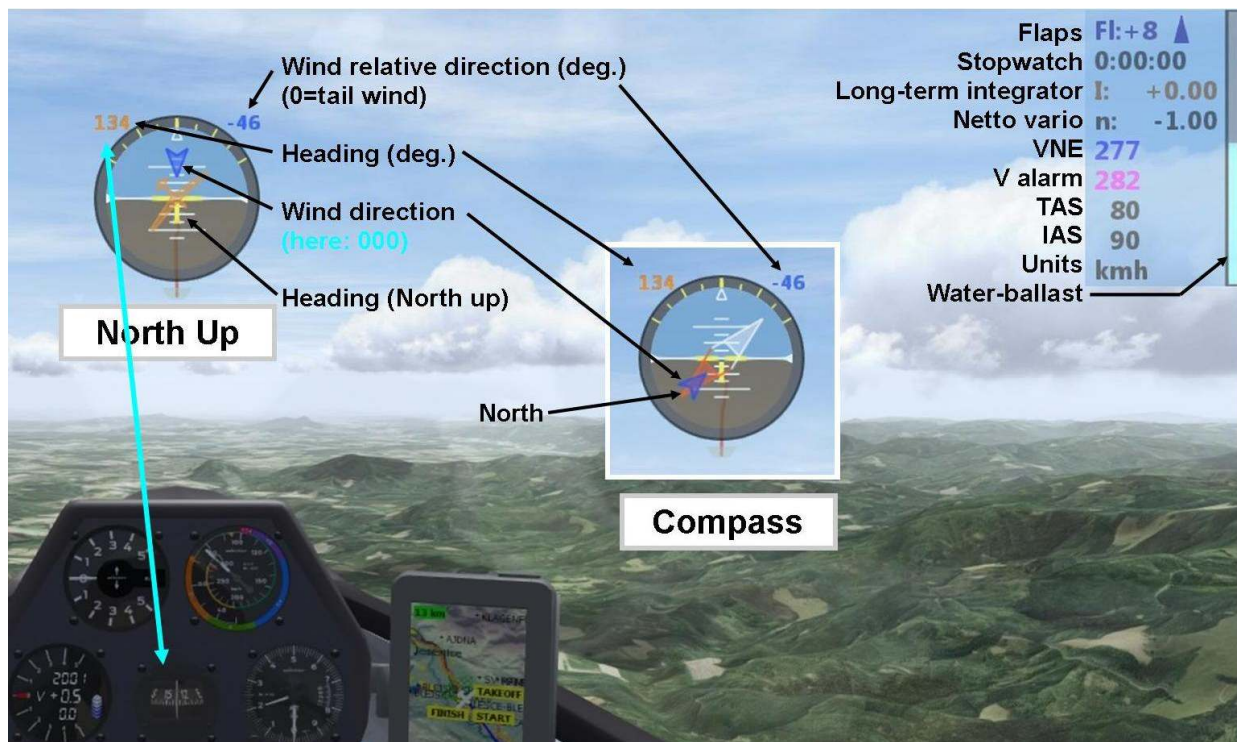
If the glider type can be determined, the VNE is set to the corresponding value read in **CoTASA_data.txt**
Otherwise, the user is prompted for a glider type or the VNE.
If in AUTO mode, the velocity unit will be taken directly from **Condor** (km/h or kts only).

ALARMS AND DISPLAYS

A sound alarm starts beeping at VA1=VNE-DV1 and the sound level increases up to VA2=VA1+DV2
The alarm volume may be set in the CoTASA.ini file and adjusted in flight (see below).

CoTASA uses the default sound device of the system.

It may happen that the alarm sounds are not heard on the same output device as **Condor** (e.g. loudspeakers and headset). In that case, take a look at the beginning of **Logs\Logfile.txt** to see which devices are available and try to find out which one may be used by **Condor**. Input the device number for the **"Sound device"** parameter in **CoTASA.ini**

The text window shows: Velocity units, TAS, IAS, Alarm velocity, VNE, Netto Variometer, Total-energy long-term Integrator Variometer[1], Stopwatch, Water-Ballast and Flaps settings.

All these values are optional and will be displayed only if available.

The font and its size can be changed. All text and graphical Water-Ballast colours can be user-defined. The number of decimal digits of climb/sink values may be adjusted.

For detailed options, see the **CoTASA.ini** file description below.

For flapped gliders, there are two ways to display flaps setting:
- current setting and, if it has to be modified, a blinking arrow, up or down (see image above)
- recommended setting, green if it is selected, blinking red if not.

In both modes a sound alarm rings (its initial state is user-defined and it can be activated or muted in flight - see below). The flaps settings alarm volume is defined as a fraction of the general sound level (it may be above 100%).
The flaps setting takes into account the actual water-ballast content and, optionally, the load factor. Sound and blinking are disabled when bank is above a pre-set value (always enabled if = 0 - default = 15° if load factor is disabled, always enabled otherwise).

A simplified artificial horizon may be displayed. It also shows the heading (arrow and/or numerical value) and the wind direction (arrow and/or numerical relative value, **as read in the flight plan, not real-time**). The heading display may be North up or in compass mode (see image above)

The text window background can be transparent or translucent or opaque. The artificial horizon can be translucent or opaque and the corners between it and the (square) window borders can be transparent or have the same opacity as the AH itself. Background and text colours can be adjusted.

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[1] for the mathematically inclined I= $((z + v^2/2g) - (z_0 + v_0^2/2g))/(t - t_0)$

For transparent windows, it is recommended to select a background colour close to sky blue (default) as that colour interferes with the edges of the text. Nevertheless you may select another colour if you spend your time flying in the bottom of valleys or canyons.

Known display issues

If the **Aero** theme of **Windows 7** is activated, the **CoTASA** windows will not be transparent (and the artificial horizon will be square)

In some configurations of **Windows 10 (**not precisely determined yet), the **CoTASA** windows are not visible if they are transparent (text) or if they have transparent parts (corners of the artificial horizon). In this case, it is necessary to disable the transparency of the text window (**Opacity > 0**) and that of the corners of the artificial horizon **(AH transparent corners=0).**

Transparent or translucent windows may reduce the **FPS** rate of **Condor**.

INTERACTION WITH CoTASA

CoTASA will detect **Condor** shutdown and may close automatically after confirmation (or not) according to the **StopWait** parameter (see description in the **CoTASA.ini** annex below). It is also possible to shut down **CoTASA** with the **ESC** key when it has focus or by closing one of the icons in the Windows taskbar.

If you start a new **Condor** flight, you should restart **CoTASA** in order to have up-to-date parameters.

When Condor (or CoTASA) has focus

It is possible to interact with the program during flight while **Condor** has focus:

- **Increase safety margin** before VNE (DV1) : use the **"I"** key
- **Decrease safety margin** before VNE (DV1) : use the **"U"** key

- **Toggle artificial horizon visibility and position** (hidden, user defined position, "HUD" position)
  use the **"O"** key

- **Activate/mute the flaps settings alarm** : use the **"M"** key

- **Increase alarm sound level**: use the **"8"** key (keyboard, not keypad)
- **Decrease alarm sound level**: use the **"7"** key.
  While being adjusted, the level is displayed in the bottom-left corner of the text window

- **Start/stop/restart the long-term integrator**: use the **"9"** key
- **Start/stop/restart the stopwatch**: use the **"0"** key

All these keys may be re-defined in the **CoTASA.ini** file and semi-interactively (see below).
The default key definitions have been set up initially for a French (AZERTY) keyboard, and they may conflict with some definition you made. Do not hesitate to review and change them if needed.

Condor messaging is detected; all keystrokes are ignored while you are typing a message. **CoTASA** automatically detects the key used by **Condor**
However, if this command has been mapped to a joystick button, CoTASA cannot detect it.
In this case, it is possible to define a substitute key in the **CoTASA.ini** file, but it's up you to operate both as synchronously as possible.

Known issues

It may happen that **CoTASA** does not respond to keystrokes anymore.
Until an automatic solution is developed, you will have to manually restart keystrokes detection by giving the focus to **CoTASA** and pressing the **"K"** key

In more rare situations, it may happen that keystrokes are no longer detected by both **Condor** and **CoTASA**.
If this happens, activate the Windows Task Manager by **CTRL-ALT-DEL**, click on the **"Processes"** tab, then on the **"Image Name"** column header, select the **CoTASA.exe** line and click on the **[End Process]** button.
If this happens too often, it is possible to prevent **CoTASA** from accessing the keyboard when it does not have focus. To do so, you must set the **KeyboardHook** parameter to **zero** in the **CoTASA**.ini file.
All functions defined above will be active only when CoTASA has focus.

When CoTASA has focus

CoTASA has focus when is starts, before **Condor** has started.
Once **Condor** has started, you must use **ALT-TAB** to bring one of the **CoTASA** windows to the foreground.

NOTE: as this will make Condor lose focus, it is highly recommended to use Pause or Autopilot before interaction.

Open the settings file CoTASA.ini in a text editor by hitting the **"E"** key.
You will have to restart **CoTASA** so that changes are taken into account.

Change key definitions semi-interactively by hitting the **"D"** key.
It is possible to select any keyboard key including system and function and keypad keys.
A popup window will show, click on the **OK** button
Hit the key you want to select, the key scancode will be copied to the pasteboard.
CoTASA.ini will be opened in a text editor.
Just paste the code obtained after the "=" sign following the key you want to edit, e.g. *Key horizon=***SCN81.**
If you want to set more than one key, do not restart **CoTASA** until after the last one is done.

Read the manual by hitting the **"H"** key (provided **Acrobat Reader** is installed on your computer).

Move the windows

Both windows may be moved about the screen or to another monitor (for the text window, preferably after **CoTASA** has started receiving data)

- **Select the window to move**: click inside the desired window (**not on a transparent part**).
  The border turns orange while the window is selected
- **Move selected window**: use the **Left, Right, Up** or **Down** arrows.
  The **SHIFT** key speeds up the movement.
- **Save the windows positions** into the **CoTASA.ini** file: hit the **"S"** key.
- **Un-select the selected window**: click again inside the window (same as above)

SUPPORT

Please report any bugs to: cotaco@marc-till.com , with **Logfile.txt** attached

DISCLAIMER

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- The **Condor** atmospheric model has been provided courtesy of UBSoft, editor of Condor.

- 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

- CoTASA uses the BASS sound library which is free for non-commercial use.
  http://www.un4seen.com/

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ANNEXES

List of files

README.txt:	README file
LISEZMOI.txt:	French Version
changelog.txt:	List of changes
CoTASA.exe:	Executable file
CpwDLL.dll:	Graphical library
bass.dll:	BASS sound library
Settings\CoTASA.ini:	Settings (see file description below)
Settings\CoTASA_default.ini:	Default Settings **(this file is read only, please do not modify)**
Settings\CoTASA_data.txt:	Glider related data (see file format below)
Settings\silhouette.txt :	Outline of the glider displayed in the artificial horizon
Manual\Manual_EN.pdf:	This file
Manual \Manual_FR.pdf:	French version
Lang\CoTASA_Lang_List.txt:	List of available languages
Lang\CoTASA_Lang_EN.txt:	Messages file (English)
Lang\CoTASA_Lang_FR.txt:	Messages file (French)
Lang\CoTASA_Lang_DE.txt:	Messages file (German)
Logs\Logfile.txt:	Log file
Sounds\VNE_0.wav	VNE alarm (min level)
Sounds\VNE_1.wav	VNE alarm (2nd level)
Sounds\VNE_2.wav	VNE alarm (3rd level)
Sounds\VNE_3.wav	VNE alarm (max level)
Sounds\Flaps_Up.wav	Flaps up alarm
Sounds\Flaps_Dn.wav	Flaps down alarm

Alarm sound files can be replaced by other sound files of comparable length.
It is highly recommended to backup the original files beforehand.

CoTASA.ini: Settings

It is possible to open this file with a text editor from CoTASA ("E" key, see above)

NOTE : If you change the units in the .ini file, any velocity values in the file will be read using the selected unit

Lines starting with **#** are ignored.
If no value is specified, the default value will be used.

- **CoTASA Version** = File version number – **Please do not modify this value**
- **Language** = Language used for messages (EN, FR or DE) default = auto detect
- **Port** = UDP port to listen to (the default value is 55278, see above)
- **Forward Port** = UDP port towards which UDP data must be forwarded   (default= none)
- **Forward Address** = UDP forwarding IP address (default: 127.0.0.1 = localhost)
- **Condor 2 path** = Path to the **Condor 2** current pilot's folder
- **KeyboardHook** = Keystrokes detection (0=no, 1=yes, default). **See above**
- **StopWait** **=**what to do when condor stops :
  -2 = do nothing
  -1 = exit without confirmation
  ≥0 = wait **StopWait** seconds and exit after confirmation

- **Unit** = Speed units: possible pre-sets are: AUTO, kmh or kph, kts, mph, fpf
  Otherwise specify name and conversion factor from m/s
  e.g. "Unit=m/s=1.0" or "Unit=km/h=3.6" etc.
- **VNE** = Default value of VNE
- **DV1** = Safety margin **before** VNE
- **DV2** = Interval between minimum and maximum beeps
- **Atmosphere Model** =Atmospheric Model used for TAS computation (0=ISA, default; 1=Condor)

- **Flaps Alarm Init** = Flaps alarm initial state (0=muted, default, 1=active)
- **FlapSoundMaxBank** = Maximum bank for flaps indicator sound/blinking (degrees, 0=always, def.=15)
- **Flaps_AverageTime** = Flaps settings averaging time (sec. - default=2.00)
- **Airspeed_AverageTime** = Airspeed averaging time (sec. - default=1.00)
- **Flaps_GFactor** = Take into account G factor for flaps settings (0/1, default =0)

- **Display VNE** = Flag to display VNE value [0/1]
- **Display VA1** = Flag to display VA1 value [0/1]
- **Display Units** = Flag to display velocity units [0/1]
- **Display IAS** = Flag to display Indicated AirSpeed [0/1]
- **Display TAS** = Flag to display Indicated TrueAirSpeed [0/1]
- **Display Netto Vario** = Flag to display the netto vario [0/1]
- **Display Long-term Integrator** = Flag to display the long-term integrator [0/1]
- **Display Stopwatch** = Flag to display the stopwatch [0/1]
- **Display Flaps** = Flag to display the flaps setting (0=No, 1=current, 2= recommended)
- **Display Ballast** = Flag to display water-ballast contents (0=no, 1=digital, 2=graphical,3=both)
- **Display Heading** = Flag to display heading (0=no, 1=digital, 2=graphical,3=both)
- **Display Wind** = Flag to display wind (0=no, 1=digital, 2=graphical,3=both)
- **North Up** = Heading display mode (0=compass, 1=North up)
- **Arrow Style** = Arrow style (0=basic, 1="nice", default)

- **Horizontal display** = Display text on one line (1) or several lines (0)
- **Opacity** = Text window opacity [0-100] 0=transparent background & opaque text, 100=opaque
- **Hor. position** = L(eft), C(enter), R(ight), or pixel value (Left=0)
- **Ver. position** = T(op), C(enter), B(ottom), or pixel value (Top=0)
- **Font name** = Font to use (default=arialbd - recommended : ebrimabd)
- **Font size** = Font size (default=24)
- **Number of Digits** = number of decimal digits for climb/sink values

    In order not to display the + sign in front of positive values, set a negative value

Colours: Black, White, Grey, Red, Green, Blue, Cyan, Magenta, Yellow or HTML style e.g. #007F00 (dark green) - case insensitive

- **ColFlap** = Colour used to display the flaps setting
- **ColWB** = Colour used to display the water ballast content (text and graphical)
- **ColVNE** = Colour used to display VNE
- **ColVA1** = Colour used to display VA1
- **ColTAS** = Colour used to display TAS
- **ColHDG** = Colour used for heading on the Artificial Horizon (arrow and numerical value)
- **ColWind** = Colour used for wind on the Artificial Horizon (same)
- **ColIAS** = Colour used to display IAS
- **ColNetto** = Colour used to display the Netto variometer value
- **ColInt** = Colour used to display the Long-Term Integrator variometer value
- **ColTimer** = Colour used to display the stopwatch

- **Text Background** = Colour used for the text window background
- **AH Corners Background** = Colour used for the Artificial Horizon corners background

- **AH size** = Artificial horizon window size in pixels. If =0, not displayed
- **AH opacity** = AH opacity [0-100] 0=transparent, 100=opaque
- **AH transparent corners** = AH corners transparency [0/1] 0=opaque, 1=transparent
- **AH hor. position** = AH horizontal position (same as above)
- **AH ver. position** = AH vertical position (same as above)
- **AH Font size** = AH Font size (-1=auto ; 0=same as text, default ; >0 actual value)

Input key definition (**uppercase, between ""**: **"U"** or ASCII code: **ASC85** or scancode: **SCN22**)

- **Key increase** = Keyboard key used to increase safety margin (default="I")
- **Key decrease** = Decrease safety margin (default="U")
- **Key horizon** = Toggle artificial horizon visibility (default="O")
- **Key Flaps Sound** = Mute or activate flaps sound alarm (default ="M")
- **Key Sound Up** =Increase alarm volume (default="8" – keyboard)
- **Key Sound Down** = Decrease alarm volume (default="7")
- **Key Stopwatch** =Start/Stop/Restart stopwatch (default="0")
- **Key Integrator** = Start/Stop/Restart long-term integrator (default="9")

- **Key Chat Open** = Substitution key to activate chat (if needed)

- **Sound device** = Device number [1-N] (default=system default device)
- **General volume** = General alarm volume [0-100] (default=50)
- **Flaps volume** = Flaps alarm volume = percentage of above [0-99999] (default=50)

- **Text editor** = Path to a text editor (default = Windows notepad)

CoTASA_data.txt: List of glider types with VNE and other data

This file may be edited with any text editor in order to add new glider types or update existing ones

Velocities in this file are in km/h, masses are in kg.
Lines starting with **#** are ignored.
Data for most **Condor1** gliders are missing, except for the **ASW27**

For non-flapped gliders (or if flaps settings data are not available) the format is:
TYPE=VNE,MAX_BALLAST
> **TYPE** = glider name **(must be the exactly the same as in Condor)**
> **VNE** = VNE **(in km/h)**
> **MAX_BALLAST** = water-ballast maximal capacity (in litres - or kg - of water)
> e.g. : **Blanik=253,0**

For flapped gliders, the format is :
TYPE=VNE,MAX_BALLAST,REF_MASS,MAX_MASS,[FLAP_VELOCITY,FLAP_SETTING],[...,...]
> **REF_MASS** = minimum mass in **Condor** (no ballast, no fixed ballast, no second pilot)
> **MAX_MASS** = mass at which the flap settings are evaluated (usually Maximum Take-Off Weight)
> **FLAP_VELOCITY** = velocity above which the corresponding flap setting is recommended
> **FLAP_SETTING** = character string to display, it is better to copy the corresponding glider data
> e.g. : **ASW27=285,190,310,500,50,5,81,4,89,3B,121,3A,156,2,213,1**