CONDOR 3

THE COMPLETE SOARING SIMULATOR

Condor Soaring Simulator
Version 3

User Guide

Updated for Condor Version 3.0.5

1 How to install and reinstall Condor 3

1.1 Computer specification

General

To install and run Condor 3 you will need:

- Intel or AMD processor with CPU benchmark for single thread rating of at least *1200*.
  Find your rating at https://www.cpubenchmark.net/
- Around 60GB of free drive space to run the installer. After install, Condor will consume 35GB
- A dedicated graphics card with 1 GB memory. We suggest the graphics card should have benchmark (https://www.videocardbenchmark.net/) score of 8000 or above.
  (Integrated graphics cards and cards with benchmark result below 1000 are usable, but with severely reduced graphics settings)
- Internet connection required for activation

PC

- Windows 7, 8, 10 or 11. Note that some Windows 11 audio device drivers are not perfect

Apple Mac

- Windows 7, 8 or 10 running in Bootcamp*, or parallels Version x.xx or Wine Version x.xx

Controls

To be able to fly in Condor, you do not need a joystick. The glider can be controlled using mouse or keyboard.
However we do strongly suggest that you should use at least a joystick with a twist rudder support.
For the ultimate experience we recommend using rudder pedals and a joystick with force feedback.

Since Condor supports multiple input devices, you can create real analogous controls for all glider controls.

1.2 Condor versions

Standard

Condor 3 standard version contains all you need to begin learning, soaring, and competing online with Condor. It includes a selection of towplanes, and 8 different gliders to use.

XC

Condor 3 XC extends the standard version with bugwipers, the Hawk vario algorithm, real time wind display, and Flarm targets.

XC option is intended for performance oriented pilots who seek maximum performance either in online competitions or record flights.

If enabled in the weather settings, during flight the wings will accumulate dead bugs. These will degrade the performance of the glider, and if you have Condor 3 XC you can activate bugwipers to remove the bugs.

The Hawk vario has very advanced processing to give improved vario compensation and real time wind direction indication.

1.3 How to download and install on your computer

To get your copy of Condor, go to the Buy page on our website

https://www.condorsoaring.com/

When you have entered all your details and paid, you will receive an email with your download link and license key.

Save the license key in a safe place, you will need it later.

Download the software from the link. When it's completed, we strongly suggest you make a backup copy of it on a CD or USB stick. Also make a text file on your backup with your license key. This is most important because computers do fail and it's important not to lose the installer or your license key.

To do the installation, run the setup program you downloaded. When it is complete, start condor and follow the instructions in the next section.

Keep Condor up to date

The Condor Team will release updates to Condor from time to time. These updates will fix bugs and add additional features to Condor. If there is an update it will usually be announced on the News page of the website and on the official Condor forums.

The update files are provided on the download page which you can find here

http://www.condorsoaring.com/v3downloads

While updates are not required to play Condor, you may not be able to join online races if you don't have the latest version installed.

1.4 First actions

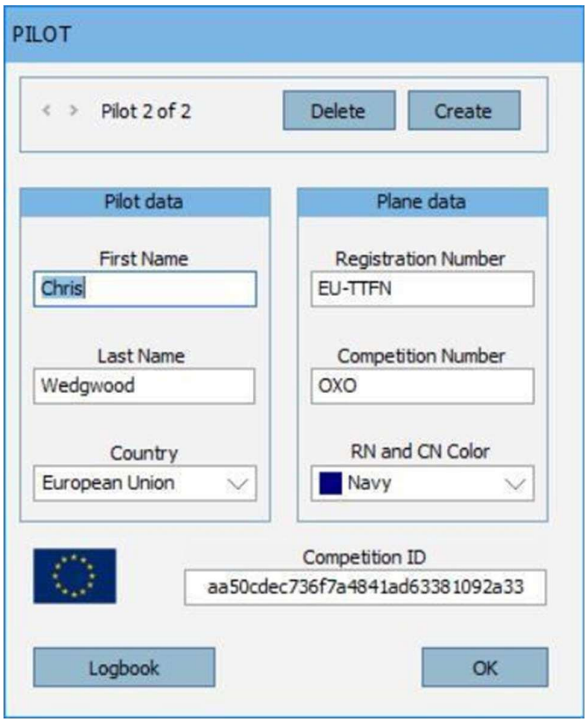
The first time you run Condor, you will be prompted to enter data for a new pilot.

The pilot's name will be used in multiplayer, replays and flight tracks. Registration number appears on plane's fuselage and on the lower side of the left wing. Competition number along with country flag appears on the plane's vertical stabilizer.

When you click OK, you enter the main menu.

On first run you must register your copy of Condor by clicking REGISTRATION and entering your License Key. Keep your License Key safe in a secure place in case you should reinstall Condor later.

The next thing you should do is setup your hardware. Every pilot has his own settings. When you press SETUP button, you can alter settings for the current pilot.



1.5 Adding more planes

Condor is supplied with 8 gliders of various types. This is enough for the new pilots to learn soaring and also for the ambitious pilots to enjoy the thrills of competition soaring.

Of course, the default selection of planes is not enough to satisfy all pilots. Some would like to fly their favorite real life glider, some would like to try out the hottest new ships for the fraction of their real life cost and also some would like to experience the early days of soaring with an old, wooden glider.

We are therefore periodically releasing new types of gliders.

The selection of planes will be mostly based on their popularity and user demand. Users can express their wishes in our planes forum https://www.condorsoaring.com/forums/

Why no 3rd party planes for Condor?

Condor uses an advanced flight dynamics model which demands a lot of accurate input data for every plane. To assure realistic flight characteristics of the planes, the data must meet our quality standards and must be critically reviewed and adapted to our flight model. We are convinced this can only be achieved by having a thorough understanding of the internals of Condor's physics model.

That's why we have decided not to allow the development of 3rd party planes for Condor. It would result in potentially nice looking gliders but with unrealistic flight characteristics which would ruin the soul of Condor which is fair, realistic simulation of competition soaring.

Installing and activating planes

After you purchase the plane, download the latest Hangar from the download page http://www.condorsoaring.com/downloads-2/ if you have not already done so.

Please shut down Condor before installation. When the installation is done, you can activate the plane in Condor by pressing the Activate button in the HANGAR tab of the flight planner and entering the license key that you received during the ordering process.
We strongly suggest that you make a backup copy your license key in a text file.

Please make sure you are connected to the internet as the validity of the key is checked online at our servers.

1.6 Installing extra landscapes

It is possible to add additional sceneries to Condor. Maybe your favourite soaring area or even your home airfield has already been made. These sceneries can be downloaded from various sources. Additional sceneries are not made by the Condor team nor are they checked by us, so quality may vary.

Some sceneries are provided as installers. This should make adding them to Condor easy. However some come in the form of archives*. This can be a single archive or a set of ".7z" files. To add these to Condor, place the downloaded file in "C:\Condor3\Landscapes". If the scenery consists of multiple files, place them all in the Landscapes folder. Then right click the file (or the first file in case of multiple files) and select extract. Once the process has finished the scenery should now be available in the flight planner window.

If your new scenery does not show up in the list, please check that the file structure is correct. The most common error is that the file structure looks like this: "C:\Condor3\Landscapes\SceneryName\SceneryName".

1.7 Moving your Condor installation

Copies

We allow you to install Condor 3 on two computers. You are not allowed to run both at the same time. This is to let you to have one on your pc at home, and another on a laptop while travelling, or away at school etc.

New PC

When you get a new computer and want to move your Condor installation to it, first install Condor and check everything is working. Then copy your Condor3/Pilots folder and Documents/Condor3 folders to the new pc, putting them in the correct locations. Finally, uninstall Condor from your old PC.

NOTE: Never move condor to a new computer by copying files. The only way to do it is by using the installer.

2 Configure Condor: SETUP

IMPORTANT RECOMMENDATIONS

1. On flat screens, use "Fullscreen emulation" rather than "Fullscreen"

2. 2 - In order to avoid unwanted effects (tow rope breaks, possible parasitic sink), **your GPU FPS should not be faster than your monitor refresh rate**
   To see what FPS (Frames Per Second) you get:
   Set Vsync OFF; run Condor; enter Shift-D. There will be a FPS number in the top left corner of the screen.

- if you are using a flat screen with fixed refresh rate: **you MUST set Vsync ON**
- if you are using a flat screen with variable refresh rate: you may use **Gsync** but we haven't enough experience with it, so if you have such issues, maybe reduce the frame rate in the graphics board settings and please report in the forum.
- if you are using VR: the refresh rate is set by the headset, 90 (=2x45) or 72 (=2x36) are fine

2.1 Setting graphics options

Fullscreen

Fullscreen graphics mode.

Fullscreen emulation

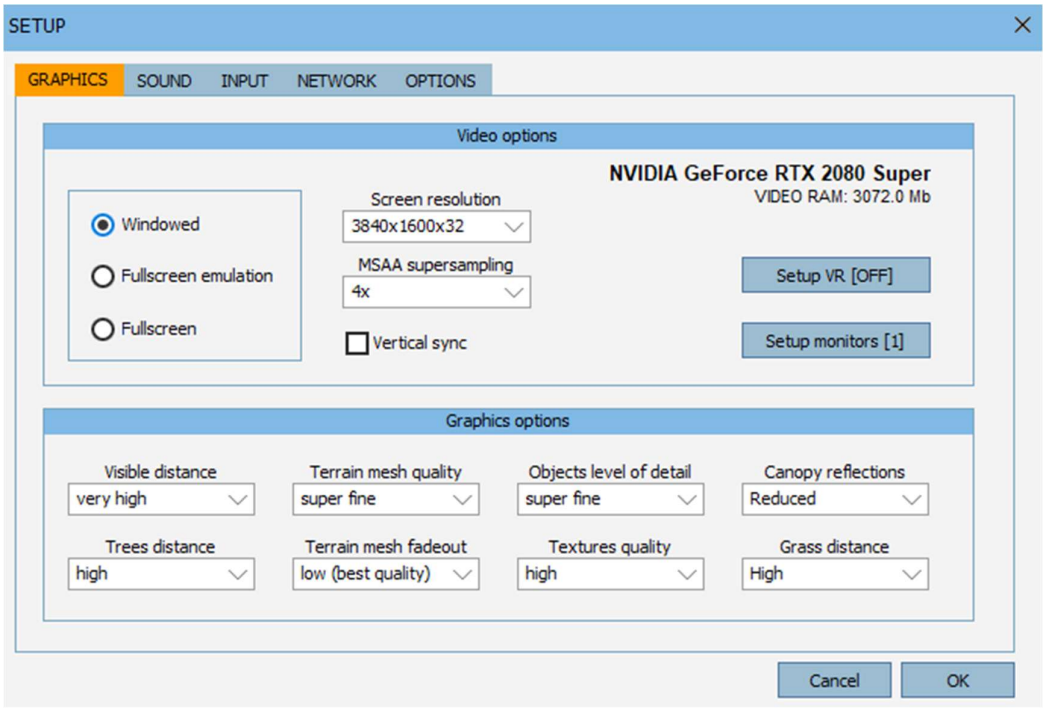
As Fullscreen, but allows Alt-Tab between running apps.

Windowed

With windowed mode you can set the dimensions of Condor window.

Setup Monitors

Configure Condor to run on multiple displays with adjustable direction offsets.



Screen resolution

Select in-game screen resolution. Higher resolutions require better graphic card but not higher CPU power. Only 32 bit color is supported so make sure you use 32 bit color for your desktop if you run Condor in windowed mode.

MSAA supersampling

Multisample antialiasing to reduce the appearance of jagged edges on the display. Setting higher values takes more GPU power so find a setting which works well for your pc configuration.

Vertical sync

When using fullscreen mode, you can synchronize game refresh rate with monitor refresh rate. Use this option only if your game refresh rate is higher than monitor refresh rate. Command Shift D will display the GPU refresh rate top left of your screen.

Note: see the recommendation at the top of the chapter

Visible distance

Select visible distance. Higher values require more CPU power. Medium option is recommended for most systems.

Trees distance

Select visible distance of trees. Higher values require more CPU power. Medium option is recommended for most systems.

Terrain mesh quality

Choose geometric quality of the terrain. Super fine is recommended for most systems. Choose lower quality only if you have an old graphics card (GeForce 2 or lower)

Terrain mesh fadeout

Choose how the terrain mesh quality degrades with distance. Low (best) is recommended for most systems. Choose higher fadeout only if you have an old graphics card (GeForce 2 or lower).

Objects level of detail

Choose how the level of detail of objects (planes etc.) degrades with distance.

Canopy reflections

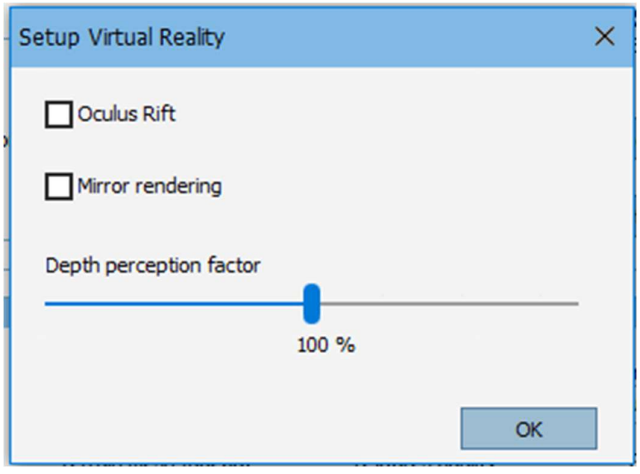
Simulates reflections on the canopy surface in the cockpit.

Grass distance

Condor 3 has realistic 3D grass on airfields. This requires a medium-high performance PC and GPU. Grass distance allows setting a lower level of grass display to allow a lower performance PC to run Condor 3.

Setup VR

Click this button and another window will pop up



Oculus Rift

Configure Condor to drive an Oculus Rift, Meta Quest 2/3 or similar compatible VR headset.
Please see the VR section for more details.

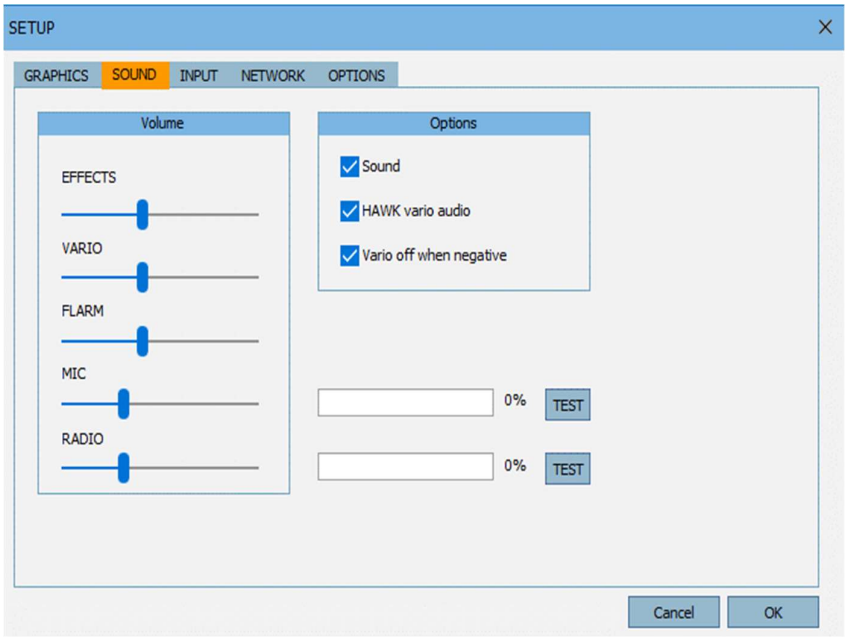
Mirror rendering

Displays the VR headset display on the PC monitor.

Depth perception factor

Adjust this to get the correct sense of scale when in VR

2.2 Sound



Toggle in game sound on/off

HAWK vario audio

If you have Condor 3 XC, then this allows you to switch between TE vario sound and HAWK vario sound

Vario off when negative

Variometer beeps only in lift

Effects

Affects in-game effects volume

Vario

Affects variometer volume (can also be adjusted in game)

Radio

Affects volume of the radio and the dual pilot audio

Mic

Sets the microphone sensitivity

FLARM

Affects volume of the FLARM collision warning.

2.3 Audio hardware setup

In our testing we find that speaker/headphone hardware setups are ok and it's quite easy to get a good solution.

Microphones, however are very variable and some have very low sensitivity. You will need to test on your hardware to find a good volume setting.

2.4 Setting the control inputs

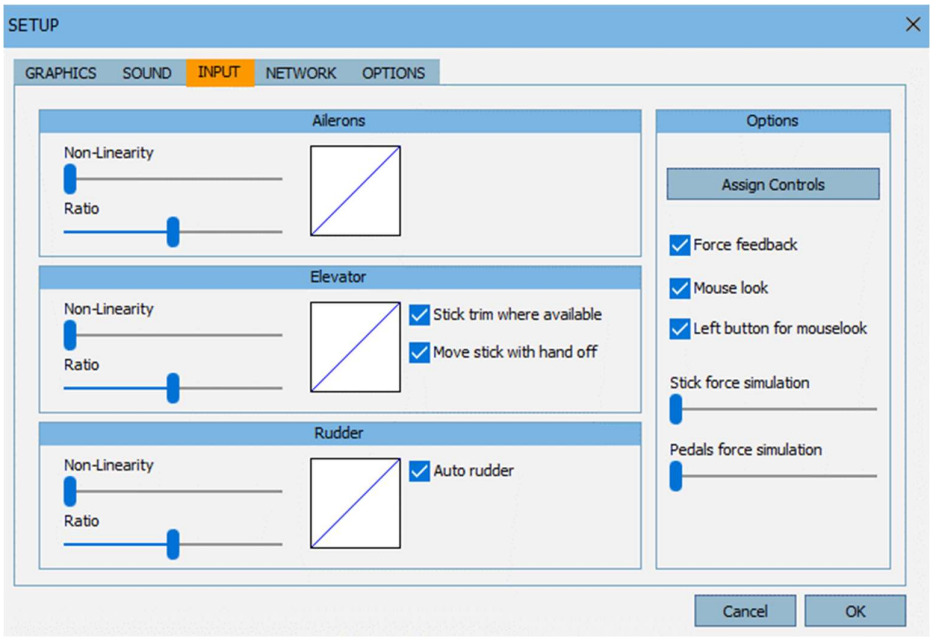
You can choose non-linearity and ratio for all three plane axes. The graph on the right shows the input device to control surface mapping when you move the sliders.

Non-linearity

Higher values produce less responsive commands in the center of your device, however maximum deflections remain the same.

Ratio

Higher values produce more responsive commands, but saturate before you reach maximum deflection. Lower values produce less responsive commands and also lower maximum deflections.



Stick trim where available

Some planes have a button on the stick to trim the plane to the current speed. Check this option to enable that. Otherwise, if left unchecked, the more common lever trim is used.

Stick centres with hand off

Pilot stick is centred because of airflow when the right hand is not holding it, for example when dropping water or raising gear.

Auto rudder

Enable automatic rudder (this can be set during the flight).

Force feedback

Recommended for force feedback devices. Has no effect when using non-force feedback devices.

Mouselook

Used to control cameras with mouse. You should disable this option or enable “left button for mouselook” when using mouse to control the pilot stick.

Left button for mouselook

You will have to press left mouse button to control cameras with mouse. Use this option when using mouse to control the pilot stick.

Stick force simulation

With this option Condor can use lag in command response to simulate pilot stick forces. Higher values produce more lag. Lag also increases with plane speed. This option can also be used to smooth out jerky input of some joysticks.

Note: It's not useful for force feedback sticks, so set those fully to the left.

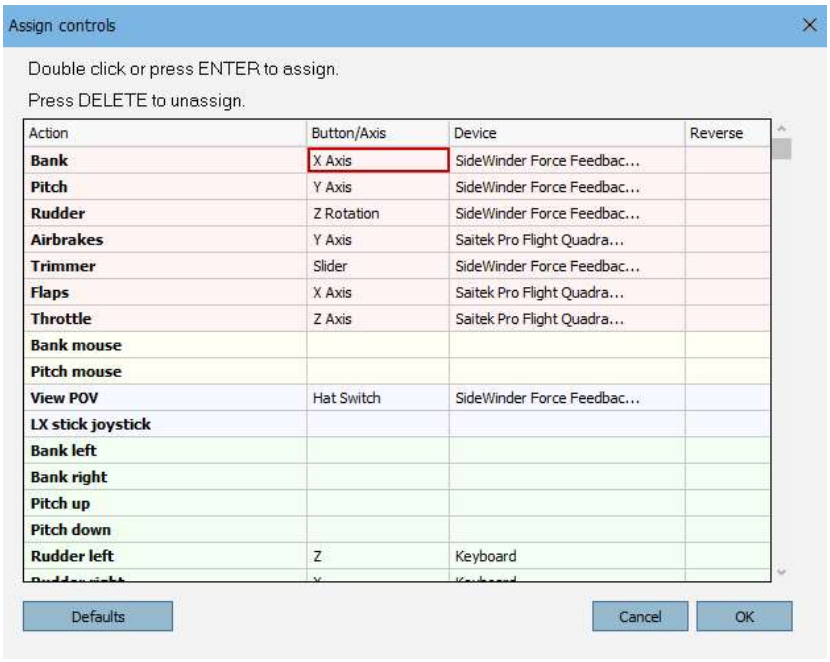
Pedals force simulation

This is similar to Stick force simulation. Set fully left for FFB pedals.

Assign controls

Pressing this button allows you to reassign every control in Condor from default buttons/axes to your custom buttons/axes.

Note: DO NOT replace the Condor 3 controls.ini file with the Condor 2 one as the control definitions are different and this would make Condor unplayable.



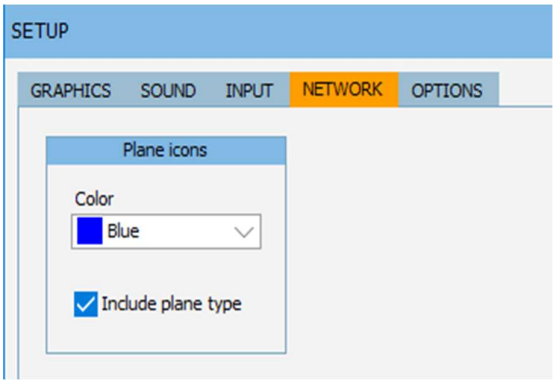
2.5 Set network options

Color

You can select a color for plane icons. Plane icon is textual information of the plane that is shown in game along with the plane.

Include plane type

Include plane type in plane icon text



2.6 Using VR devices

Condor supports the use of VR headset devices. We have started with the most common types, Oculus Rift and Meta Quest 2/3, and other devices are possible by using compatibility apps downloaded from the internet.

Oculus Rift and Meta Quest 2/3

Before getting a Meta Quest headset, it is important to check that your computer is sufficiently powerful to use it. The Meta website has a system requirements page. Go to:

https://www.meta.com/en-us/help/quest/articles/headsets-and-accessories/oculus-link/requirements-quest-link/

Using Quest with Condor is easy. Get your Quest setup correctly with the Quest sensors and position yourself at

the correct height etc.

Then start Condor and tick the Oculus Rift checkbox in Setup.

HTC Vive and other devices

Similarly, the vive website has a system check app. Go to

https://www.vive.com

To use Vive with Condor you must use the Revive compatibility layer app available from

- https://github.com/LibreVR/Revive

Installation steps:

- Install SteamVR (which Vive users will have anyway) Install Oculus Home without doing initial setup
- Install Revive
- Install Condor and copy the content of Revive\Revive folder into Condor folder (x86 and x64 Revive injectors and their related folders)

The first three steps are the usual Revive install routine, unrelated to Condor.

To run Condor:

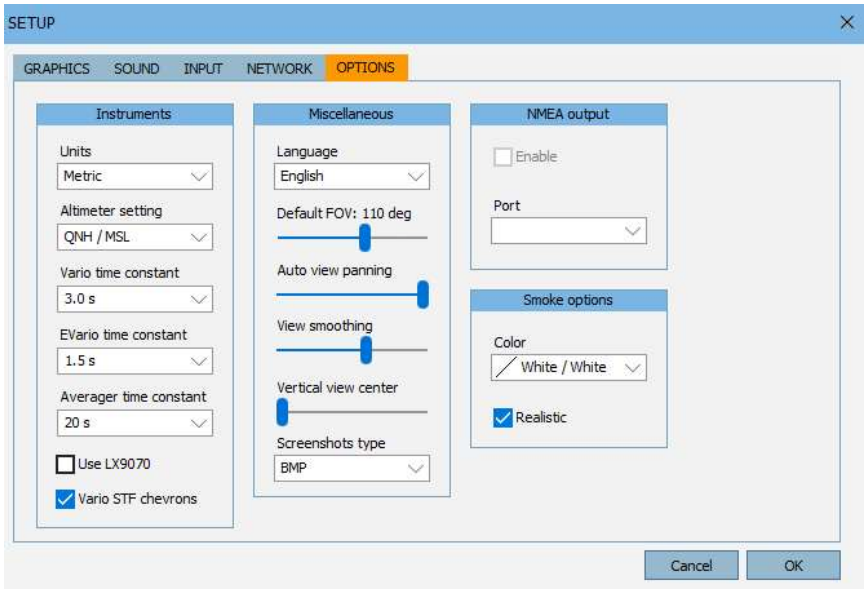
- Start SteamVR
- In the SteamVR dashboard pick the Revive tab
- Drag and drop Condor to ReviveInjector_x64.exe (we have 64bit machine/OS)
- Fly

Note: It may be required to set MSAA to zero for Vive.

2.7 Set other Condor simulation options

Units

Select units (metric, imperial or Australian) used in menus and in game



Altimeter setting

Select QNH or QFE altimeter setting.

Vario time constant

Select pneumatic variometer time constant. Lower values indicate shorter response times, higher values indicate longer response times.

EVario time constant

Select electronic variometer time constant. Maybe the best solution is to set a fast pneumatic variometer and a

slower electronic variometer.

Averager time constant

Select averager time constant. Averager is a special variometer with very long response time that “averages out” small variations in vertical movement and reports “average” lift.

Use LX9070

The option is available in the XC version of Condor 3.It replaces the Condor flight computer with an LXNav 9070 flight computer.

Vario STF Chevrons

Displays the speed to fly vario display with chevrons instead of the bar display.

Language

This option will be made available in the future, for the time being Condor is only in English.

Auto view panning

Condor can pan your view direction according to plane movement direction. The lowest value results in straight forward view – no panning, higher values result in more panning.

Default FOV

Sets the Field Of View of the camera. If you have multiple monitors, this will affect the offset of the side monitors

View smoothing

The level of camera movement smoothing.

Vertical view center

You can set the pitch of the pilot’s view in F1 camera.

Screenshots type

Select between JPG and BMP format for screenshots taken during the game. Select BMP for higher quality, but much bigger images.

NMEA output

You can enable NMEA output to one of your serial ports and connect a Palm, PocketPC or other navigation hardware that supports NMEA.

Smoke options

You can set the wingtip smoke parameters

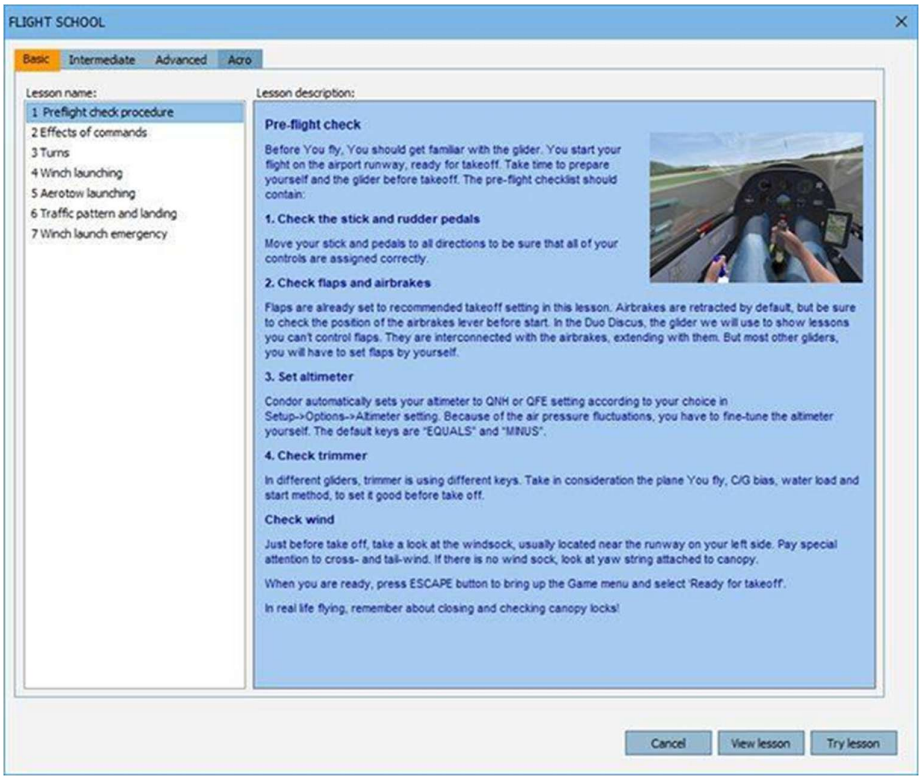
The Color box sets the colors of the left/right smoke plumes

3 Flying lessons

The purpose of flight school is to provide all necessary information to teach you how to fly, how to soar and how to compete in soaring.

Flight school is based on lessons. After you read lesson description you can view the lesson with “View lesson” button. The instructor will guide you through the lesson with comments on top of the screen. When you feel ready, you can try the lesson yourself by clicking “Try lesson” button.

The lessons are divided into five groups:



Basic

The basic level will teach you how to fly. It is recommended to start with the Basic level even if you feel it’s too easy for your knowledge. The reason for this is that the basic lessons will also teach you the keys and commands that are essential to fully exploit Condor.

Intermediate

Weather is the motor of soaring flight. The main purpose of intermediate level is therefore dedicated to teach you how to use weather for soaring.

Advanced

Here you will learn how to use your knowledge of soaring to successfully take part of competitions. Good soaring techniques are essential but not all you need to be fast. This lesson will therefore also teach you how to optimize your flight in lift and between lift and how to use modern instrumentation to navigate and round turnpoints efficiently.

Acro

Acrobatic lessons for advanced pilots.

Custom

Custom lessons.

3.1 How to best use flight school

Flight school consists of practical lessons. The textural information of the lessons that follows is also included in the simulator itself. You should read the text and follow all the lessons as they not only provide information about soaring but also information about using Condor.

Basic – Pre-flight check

You start your flight at the airport runway, ready for takeoff. Take time to prepare yourself and the glider before

takeoff. The pre-flight checklist should contain:

1. Check the stick and rudder pedals
   Move your stick and pedals to all directions to be sure that all of your controls are assigned correctly.
2. Check flaps and airbrakes
   Flaps are already set to recommending takeoff setting. Airbrakes are retracted by default, but be sure to check the position of the airbrakes lever before start.
3. Check trimmer
   Trimmer is set to neutral position on default. Depending on your C/G setting you may want to trim your glider up or down.
4. Check wind
   Take a look at the windsock, usually located near the runway on your left side. Pay special attention to cross- and tail-wind.
5. Set altimeter
   Condor automatically sets your altimeter to QNH or QFE setting according to your choice in Setup->Options->Altimeter setting. Because of the air pressure fluctuations, you have to fine-tune the altimeter yourself. The default keys are “EQUALS” and “MINUS”.

When you are ready, press ESCAPE button to bring up the Game menu and select ‘Ready for takeoff’.

Basic – Effects of commands

Use elevator to change the sailplane's pitch.

Use ailerons to change the sailplane's bank.

Use rudder pedals to change the sailplane's yaw.

Basic – Turns

To turn, deflect ailerons and rudder to the direction you want to turn. Try to keep the yawstring centred. You will also have to pull the stick gently backwards to prevent the nose from dropping.

When you reach 30 degrees of bank, centre ailerons and rudder, but maintain backward pressure on the stick. The glider now turns with a constant rate. Try to keep bank and pitch constant by applying small corrections with the stick.

Slightly before you reach the desired direction, apply ailerons and rudder to the opposite direction of the turn. You will also have to release the stick gently forward to prevent the nose raising. When the wings are level, your nose should point to the desired direction. Center all commands.

After you master normal turns with 30 to 45 degrees of bank, try some steeper turns. Steep turns require more airspeed and a lot more backward pressure on the stick. You can also practice S-turns to improve your coordination of commands.

Basic – Winch launching

Winch launching can be hazardous if the plane and the pilot are not well prepared, so be sure to make a good pre-flight check first.

With controls centred, press ESC and select “Ready for takeoff”. The wings will level and the winch will apply throttle. The glider will start to accelerate quite fast. Maintain wings level and when the speed reaches some 80 km/h, gently pull the stick to pull of and gradually climb into a steeper angle.

For most gliders the speed in steady climb should be around 110 km/h (60 kts). Maintain constant speed with wings level.

The climb angle will slowly become less steep as you reach the top of the climb. When the vertical speed drops to below 1 m/s (2kts), pull the release handle. Gear up and you are ready to soar.

Basic – Aerotow launching

Again, make a good preflight check to prepare the plane and yourself for towing.

Press ESC and select “Ready for takeoff”. The towplane will start its engine and taxi in front of your glider. The wings will level and towplane will apply throttle. The glider will start to accelerate. Maintain direction and try to keep the wings level. This can be quite tricky as the commands are less responsive at low speeds.

When the speed reaches some 80 km/h (45 kts), gently pull the stick to lift the glider of the ground. Try to follow the towplane some 1 – 2 m (3 to 6 feet) above the ground until the towplane starts to climb. In aerotowing, the towplane should be located at your horizon or slightly above.

When turning, try to keep the same angle of bank as the towplane. Apply small but prompt corrections and follow the path of the towplane. If anything goes wrong, release immediately.

The towplane will tow you to your task starting point and then try to find thermals nearby. When you reach the desired altitude, the towplane will rock the wings, which is a sign you should release. Gear up and you are ready to start soaring.

Basic – Traffic pattern and landing

In soaring, traffic pattern is very important as the gliders don’t have a second chance like motor planes if anything goes wrong. So traffic pattern should be your standard practice even if landing out.

When you start traffic pattern, you should be located parallel to the landing point some 300 – 500 m (yards) from the runway, around 200 m (600 feet) above the runway. At this point you should check that landing gear is down and then fly downwind parallel to the runway. Maintain at least 90 km/h (50 kts) throughout the pattern. In turbulent or unpredictable conditions add 10 to 20 km/h (5 to 10 kts).

Traffic pattern should ideally look like rectangle from above. The task is to adapt the position of the two following turns so as to fly your final approach with half airbrakes open and land at the beginning of the runway. This, of course, takes some practice to master, especially in windy conditions.

When you approach the runway in the final approach, always try to fly on the line of the ideal glide angle, that is the angle with half brakes open that finishes at the beginning of the runway. This means that when you are low, you will retract the airbrakes to reach the ideal line as quickly as possible and vice versa. When you are on the ideal line, just keep airbrakes half open and maintain the speed.

When you are 5 to 10 m (15 to 30 feet) high, slowly pull the stick to stop the glider some 50 to 100 cm (2 feet) above the runway and then try to maintain that altitude for as long as possible to reduce the landing speed. When the speed is reduced, the glider will land by itself. Be careful to maintain the wings level when rolling out.

Basic – Winch launch emergency

Sometimes things just like to go wrong.

During a winch launch, cable sometimes can break, leaving the pilot with low speed, low altitude and nose pointed into sky.

When this happens at the beginning of the launch (up to 50 meters), push stick forward, make sure that airspeed is at least 90km/h and not dropping, and land ahead.

When this happens above about 100 meters(300ft), push stick forward, make sure that airspeed is at least 90km/h, and not dropping. Then do gentle, about 30 degrees change of course to the downwind side of runway. After this maintain straight flight for couple of seconds, and turn back against the wind about 210 degrees until flying along the runway. Then land, but remember about tailwind, so use more airbrakes, because ground speed is higher.

When cable break happens above 150 meters, just keep calm, keep airspeed, and do tight landing circuit, with first two and last two turns are connected, so it is actually two 180 degrees circuit.

In this lesson, the second case will be flown.

Intermediate – Thermal soaring

Thermals are vertical columns of rising air that is warmed from the hot areas on the ground like fields, villages or slopes facing the sun. They have roughly round cross-sections with diameters from 100 to 500 meters (The visual indications of thermals are cumulus clouds that form when the rising air cools down below dew point and the water vapour starts to condense. When the reservoir of warm air at the ground is exhausted, the lift starts to weaken and finally the cloud dissipates and the cool air starts sinking.

In windy conditions the thermals are usually inclined and are moving with the wind at the same time. So a good place to find thermals on a windy day is downwind of thermal generators. You circle in inclined thermals almost as if they were not inclined as the wind shift is the same for your glider and for the rising air itself.

In Condor you can visualize otherwise invisible thermals by pressing the default H key. Updrafts are colored red and sink is colored blue. Still air is white. Try to find thermals in the early stages of development – under small, developing cumulus clouds or even if no cumulus cloud is formed yet. Avoid old, dissipating cumulus clouds as you will likely find only sink below them.

When the air is very dry or if we have too low temperature inversion layer, no cumulus clouds will form, but that doesn't mean there are no thermals, there are – they are called "blue thermals", but they are far harder to find. Thermal soaring is usually the main source of lift in soaring and very long distances can be covered by circling in one thermal and gliding to the other. The better pilot will find stronger thermals and climb faster to reduce the overall task time.

Intermediate – Ridge soaring

Ridge lift is generated when the wind blows towards a mountain ridge. The air is deflected upwards in the front part of the ridge but sinks back down at the lee side of the ridge. In ideal conditions the wind is strong, and the ridge is long and perpendicular to the wind direction.

The lift extends vertically about two times the height of the ridge, in ideal cases even more. When we fly below the ridge top, it is usually best to fly close to the ridge, but when we are higher, the area of best lift shifts slightly towards the wind. We avoid the lee side of the ridge since sink and turbulence can be expected.

When flying along the ridge we must search for areas where the terrain is concave. In such areas the lift is stronger as the air speeds up because of the air flux conservation.

Very long ridges can be flown in ideal conditions. Flights over 1000 km (500 miles) have been flown using exclusively ridge lift.

Intermediate -Wave soaring

Wave lift can be found in special conditions at the lee side of the mountain ridges.

If the wind is blowing perpendicular to a long ridge, then on the front side of the ridge the air will rise and normal ridge lift can be expected. The air will then sink at the lee side. If the atmosphere is very stable and the wind is strong, the air will rebound upward once again. This upward swing is called wave lift. The height of a wave lift can surpass the height of the ridge lift in front of the ridge and often reaches 5000, sometimes even 15000 meters.

Intermediate – Upslope winds

Upslope winds are formed at the sunny sides of the slopes. The air is heated and therefore rises up the slope all the way to the top of the ridge.

Upslope winds are usually not very strong, but are quite consistent and predictable. Glider pilots can fly long distances by just following the ridges. At northern hemisphere, we look for east facing slopes in the morning, south facing slopes at midday and west facing slopes in the evening.

Intermediate – Outlanding

Sometimes there is no chance to land on airfield. Ability to safe landing the glider in terrain is vital to make cross-

country flying safe.

When conditions are deteriorating, it is good to think about terrain that is below glider. It is best not to fly between mountains or big forests at less then 500m, as sudden sink can leave glider without a safe option for landing.

Below 300 meters above the ground, there should be potential outlanding field chosen.

Best fields should be plain, without obstacles and aligned with the wind, with at least 250m length and 50m width. If there are buildings or trees on the side, where landing is planned, another 200m should be added to minimum field length. Landing maneuver is similar to airfield one and downwind leg is last good moment to have a good look at chosen place. It is crucial to plan landing so final leg is against wind, and if we are too high even for full airbrakes, sideslip maneuver should be considered.

If outlanding happens in hilly terrain, landing direction should be always done uphill, and with little more speed. It may be good idea to purposely put one wingtip on the ground on last moments of rolling, so the glider will turn about 90 degrees and stay safe from rolling back.

Advanced – Starting task and navigation

The task you set in the flight planner should be flown as fast as possible. The time starts running after a specified period of time – "Race in" time, set in flight planner. After takeoff, you should try to quickly gain height to start the task as high as possible. In the upper left corner of your screen you can see when the race will start.

When the race starts, you must round the starting turnpoint. You should pass through the turnpoint sector, drawn in red color on your Flight Computer screen 1. Ideally you should already be in the starting sector when the time starts running.

You can navigate to the next turnpoint in three ways:

1. Using Flight Computer screen 2. The black dot on the screen shows the direction of the next turnpoint. When the dot is in the center of the screen, you are flying directly towards the turnpoint. This screen also shows various data related to the next turnpoint: bearing, heading, distance, VMG – velocity made good, TTG – time to go and ETA – estimated time of arrival.
2. Using moving map on Flight Computer screen 1. You can estimate your direction from the plane icon drawn on the moving map. The next turnpoint sector is coloured red.
3. Using task helpers – default J key. The turnpoints are visualized as vertical stabs. The stab of the next turnpoint is colored red and yellow while other stabs are colored in red and white.

In addition to normal FAI sectors you can also set "Window" type of turnpoints. To round this type of turnpoint you must fly through a window of specified width and height. The orientation and altitude of the window is also set in flight planner. If you are not using task helpers you should use Flight Computer screen 3 to correctly fly through the window. The red dot must be brought to the center of the screen. That means that you are at the correct height and that you are flying towards the window. However, to fly trough the window in the right direction, you must also get the blue vertical line to the screen center. This line shows your relative position to the window direction centerline.

You complete the task by rounding the final turnpoint.

Advanced – MC theory

When trying to maximize your cross-country average speed, you come to the question of how fast to fly between thermals. You can fly fast to reach the next thermal as quick as possible, but you will lose a lot of height that will have to be gained back in the next thermal. On the other hand, you can fly slowly and preserve your height, but you will loose too much time to reach the thermal.

The problem was solved by Paul McCready and his theory is called MC theory. It says that the optimal speed to fly between the thermals is the same as the speed of best glide when flying trough sinking air with vertical speed that is equal to the rate of climb in the next thermal. Sounds complicated?

Today we luckily have computer instruments on board of every modern glider that show us how fast to fly. There is

one important thing that the pilot must estimate himself though: the expected rate of climb in the next thermal. This rate of climb is usually called MC setting. If we expect 2 m/s climb, we set the MC to 2.0 and the computer will output the optimal speed to fly.

One would expect that the optimal speed to fly remains constant till we change the MC setting. It is indeed the case in still air. But if we fly through the air that moves either vertically or horizontally, then the optimal speed will change. But the pilot has nothing to worry about as the computer does the job – the pilot only follows the given speed.

We can switch from vario to "speed to fly" with the default RIGHT CTRL key. The vario needle will then show if we are flying too fast or too slow. If the needle points up, we are flying too fast and vice versa. To relieve the pilot from watching the vario all the time, the sound signal is also emitted. If we are too fast, the tone is high, if we are too slow, the tone is low and if we have the right speed, the vario becomes quiet.

Advanced – Final glide

When circling in the last thermal of the task, the pilot usually asks himself how high to climb. This is of course important for him to reach the airfield. But when racing, the height of departure from the last thermal has also a big influence on the time it takes to reach the finish point.

Again, MC theory does the job. We set the MC to the rate of climb we currently have. The computer will assume that when leaving the thermal, you will fly with the speed that corresponds to that MC setting. Given the estimated speed, the computer can compute the estimated glide ratio and as it also knows the distance to the finish point it can also compute the optimal height to leave the thermal.

Our final glide computer is found on the Flight Computer screen 2. The red dot shows the height at which we will cross the finish line if we will fly with the speed that corresponds to the current MC setting – assuming the air will be still in our final glide. If the dot is below the screen center, we are higher that required and vice versa.

Advanced – Flaps, water and improving speed.

Cross country racing is game against nature and opponents that is played on three levels.

Level one is skill and handling. This is how well you fly a sailplane, how smooth turns are or how much time does it take to find a thermal under the cloud. Basic and intermediate lessons are teaching this. You can also adjust glider to individual style of flying using center of gravity position. Moving it forward makes glider more 'nose heavy' and also stable. It means that it's easier to handle but less maneuverable. Moving CG backward, to position 'tail heavy' makes glider more agile but also harder to control.

Level two of soaring is skill and experience. This layer is about situational awareness. How fast glider should fly between clouds, what cloud should give lift and what place is better to avoid. Intermediate and advanced lessons were about this. Racing gliders are making this more complex with possibilities of taking water ballast and using flaps. Having plan for next 5 minutes is mandatory if one wants to be successful on cross-country flight.

Level three is risk management. This cannot be taught. Is it better to stay in weak lift, or to go for that nice cloud just 15kms away? A pilot who flies too aggressively is going to land out often, or find himself low and with only weak lifts to use. A pilot who flies too "safe" will waste time on thermalling often, when keeping himself high.

As stated racing gliders have possibilities of using flaps and water ballast. This is new, after flying Duo Discus.

Making glider heavier with water makes it fly faster, while sink is also bigger. In fact, glide ratio is not changing, just speed increases. This is good for cruise flying, allowing to cover the same distance in less time. However heavy gliders are more difficult to handle, and are not so good in thermals or other conditions that require to maneuver or fly slow. During flight, you can drop water. 'W' key opens and closes valves of water tank. It takes several minutes to empty all water from glider. Of course it is one way – you cannot gain water during flight!

Flaps are surfaces at the trailing edge of wings that are deflecting up or down. Deflecting flaps up ('f' key), decreases both lift and drag coefficients – increasing glider's performance at high speed and decreasing the low speed one. Flaps down ('v' key) are better for low speeds. Usually, the lowest possible position of flaps is not improving glide ratio at all, but allows glider to fly slower. This is useful for landing or very tight thermals.

Last but not least – the most advanced and sophisticated device onboard is not the Flight Computer, not variometer but the pilot's brain. Use it.

Acro – Stalls and spins.

Stall is what happens when the glider is flown below minimum speed. The angle of attack is increasing, but the lift coefficient is not. When the glider passes the critical angle of attack, lift drops. the last warning for the pilot about this, are wings shaking (buffetting).

If the stick is not pushed forward fast enough, glider loses its lift, the nose goes down with a tendency for a wing to drop and the possibility of an inadvertent spin

Spin is what happens when the rotation is not stopped fast enough. Fast autorotation of glider, ailerons becoming unresponsive and rapid altitude drop are making spins dangerous if not stopped. To stop the glider spinning, push rudder opposite to the spin direction and the stick slightly forward. When rotation stops, get rudder neutral and pull from the dive. Do it fast so that the glider does not overspeed, but gently to avoid control loss.

Spins are happening to inexperienced pilots when thermalling or making turns during landing circuits. Accidental spin at low altitude is extremely dangerous.

Acro – The Loop

To fly a loop, start a 45 degree descent to gain speed. Take the runway below as a reference of your flightpath. When you reach 200 km/h (125 kts), level your plane.

Start to pull the stick. Nose is raising and speed is dropping. You have to reach the top of the loop before your speed is too slow. Check your g-load to not crash the plane. Finish your loop with the plane leveled. That is all.

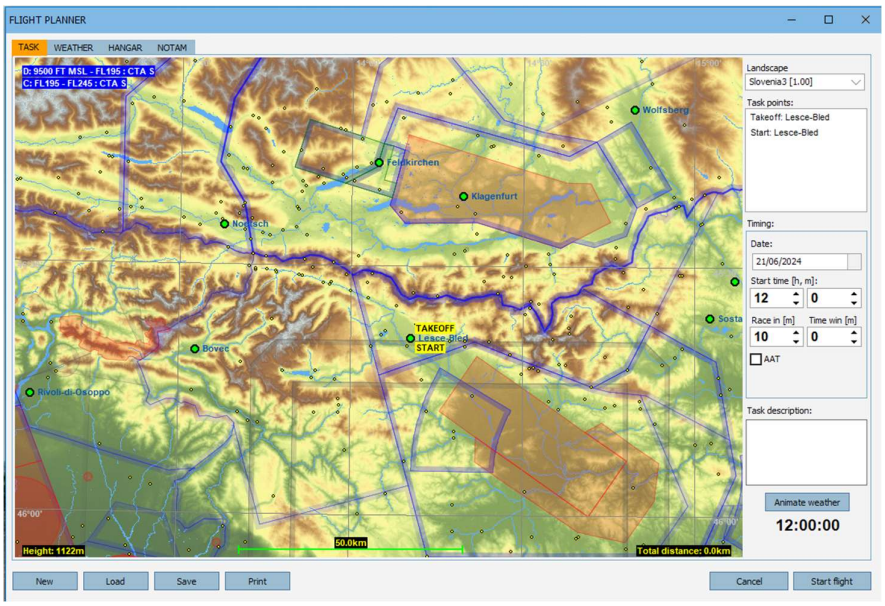
When navigation helpers and acro box options are enabled, you can enable virtual cube that you should fit aerobatics in by pressing the 'J' key .

4 Flying alone

Free flight or single player mode starts with Flight planner, where you define every aspect of your flight. When you define your flight plan, you can save it to file and load it later. You don't need to manually save your last flight plan as it saves automatically and then loads it the next time you enter Flight planner.

4.1 Planning a goal for your flight: TASK tab

In this tab you define your flight task. You do this by selecting your take-off airport and then continue adding turnpoints with the mouse. One way to stop adding points is to select your start or takeoff point again. Another way is to bring up the popup menu with right click and to select Finish task.



When the task is defined, you can move turnpoints by dragging them to a new position. If you want to insert a turnpoint, just hold CTRL and drag an existing turnpoint to a new position. Another way is to bring up the context menu with right click and selecting Insert. If you want to remove a turnpoint, select Remove from context menu. You can change the properties of selected turnpoint by selecting Properties from the context menu.

Condor uses two sector types that you can assign to turnpoints: classic type and window type. If you select classic type, the turnpoint rounding will be successful if you fly through the sector zone. You can specify sector radius, sector angle, minimum and maximum height. Window type sector is actually a window-type rectangle that has to be flown through for successful turnpoint rounding. You can specify its center altitude, width, height and azimuth. Azimuth is the direction in which the pilot has to fly through the window.

Note: It's quite difficult to fly through window type sectors, especially without 3D task helpers enabled. It's therefore recommended to use classic type sectors for beginners.

Setting a remote airstart point

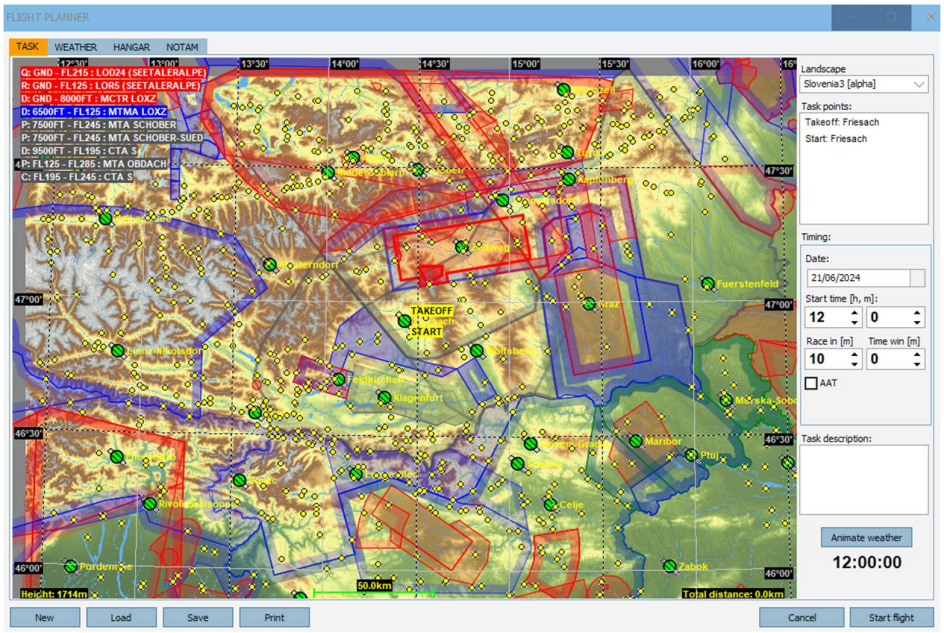
In Condor 3 this feature has been added so that you can have an airborne start at a predetermined point. The main purpose is to allow repeats of the same exercise when under training, for example practising circuits without having to repeat the takeoff and landing each time.

To use, make a task in the usual way. Set the launch method to "Airstart" in the NOTAM tab. Then move the takeoff point to your desired location. The direction the plane will be pointed is towards the start point, and the altitude is set in the NOTAM tab: Aerotow/airstart height.

To restart in an online competition, you have to land safely at the nearest airport to the airstart location, less than 500m from the runway centre line.

Airspace management

Condor 3 includes real airspace with Slovenia 3. As you can see, it can be quite complicated. For this reason it is possible to disable each airspace when you define your task.



Point the mouse at the airspace you want to disable and right click. A menu will appear with the option to enable or disable the airspace.

The airspace will then be deactivated in Condor and you can fly into the disabled airspaces without penalty.

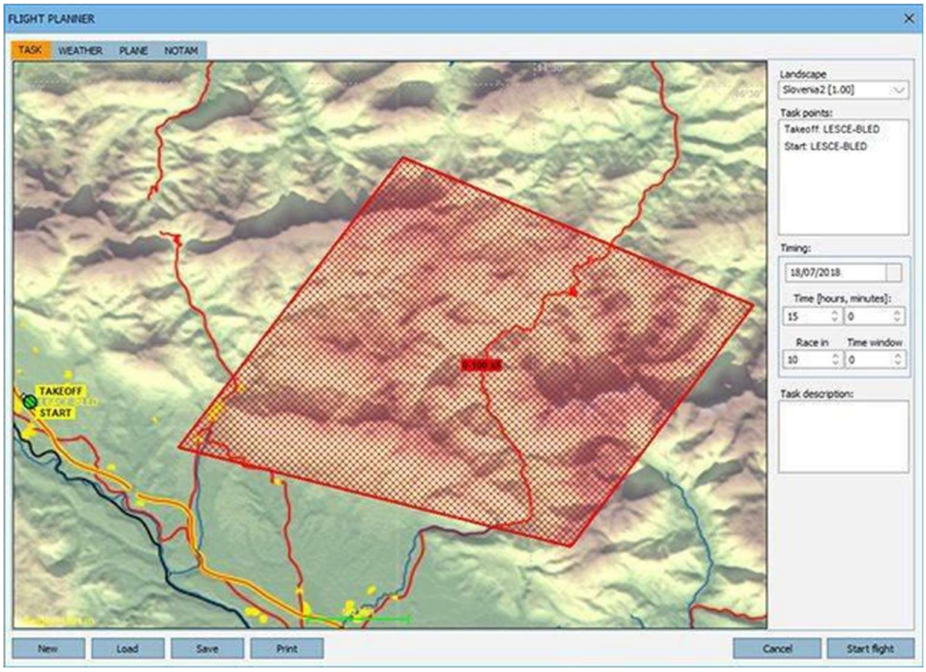
Note: This is not the same as hiding the airspace in the view popup!

Note 2: Third party add-on landscapes may be supplied without any airspaces defined. Contact the landscape author and request they add the airspaces.

Penalty Zones

Condor also allows you to specify Penalty zones. These are user defined areas in the airspace that are prohibited to enter. If the pilot enters one of these zones, he gets penalty points.

You define a new penalty by clicking New -> Penalty zone from the context menu that you bring up with mouse right click. Then click on the map three more times to finish the penalty zone. When the zone is defined you can drag its corners with your mouse. To change the properties of the penalty zone you first have to select it by moving the mouse inside the zone. Then bring up the context menu and click Properties.



Here you define the bottom and the top of penalty zone and amount of penalty points that the pilot gets every minute when flying in the zone.

To delete the penalty zone you first have to select it and then click Delete from context menu.

Start time

Here you specify the day (local solar) time of the simulation start (hours, minutes).

Race in

Here you specify how long after last tow the race starts (minutes).

Time window

The pilots can start the task in the specified time window after the race starts. If you set it to 0, the start will be regatta type – all pilots start at the same time.

Task description

Here you can write a description of the task. Especially important if you will be hosting this task online later so other pilots can understand it.

Shortcuts:

- Zoom in/out: press SHIFT key together with left or right mouse click to zoom in/out.
- Insert turnpoint: press CTRL key and drag the selected turnpoint to insert a new turnpoint after the selected turnpoint.

Custom landscape maps

You can create or download custom landscape maps for the scenery area.

Just put a custom bitmap with the same dimensions as original LandscapeName.bmp file to Condor/Landscapes/LandscapeName folder (LandscapeName is the actual name of the scenery).

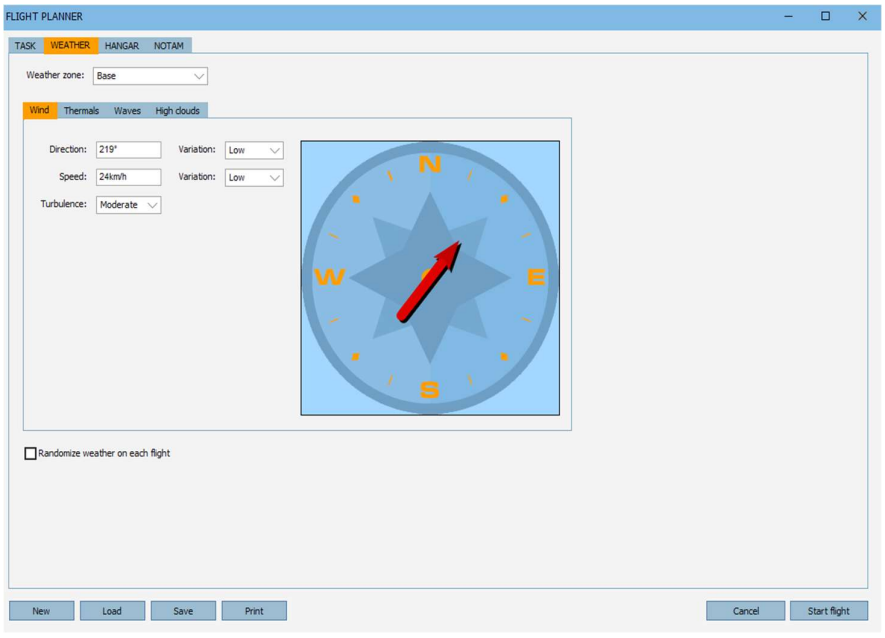
In Flightplanner, right click, select Maps and choose your preferred custom map. The map used in flight planner will also be used on your Flight Computer navigational screen.

4.2 Controlling the soaring conditions: WEATHER tab

This tab allows you to define weather for your flight. You can choose one of the Weather presets in the lower left corner. If you choose Custom, you will be able to change all weather settings manually.

Wind panel

Click on the wind rose to select wind speed and direction. Hold CTRL key to get more course directions and speeds. The wind you define in this way is synoptic wind and defines general wind speed and direction. Condor then computes wind speed and direction according to altitude, terrain etc.



Direction variation

Here you specify the amount of daily general wind direction variation.

Speed variation

Here you specify the amount of daily general wind speed variation.

Turbulence

Here you specify the general amount of mechanical turbulence caused by wind. Mechanical

turbulence is then computed according to this setting, wind speed, terrain etc.

Note: In addition to wind shift, wind also influences slope and wave updrafts.

Thermals Panel

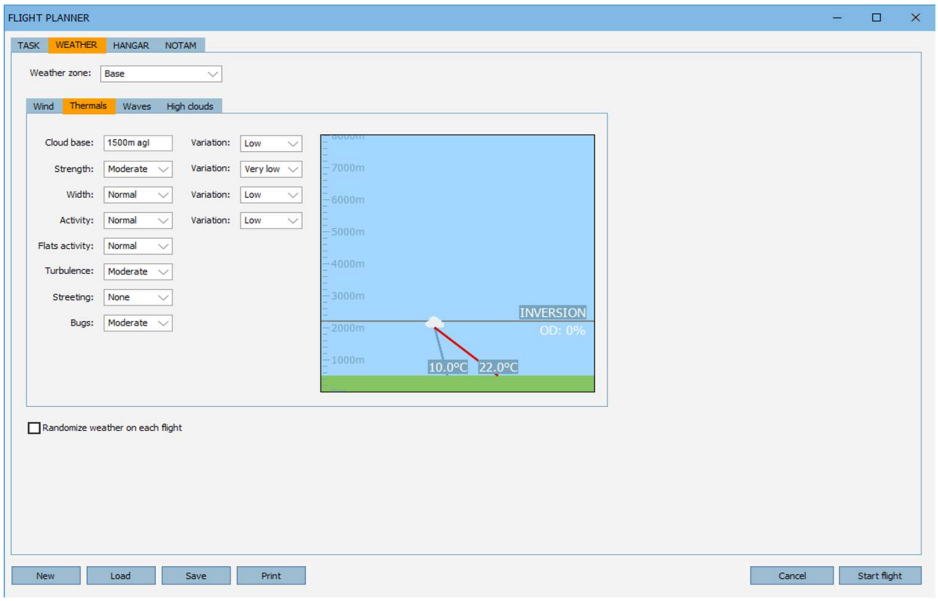
The image shows a graphical representation of cloud development. The cloud base is dependent on surface temperature and dew point. You can alter temperature and dew point by dragging them left or right. The cloud base changes accordingly. You can also change the height of the inversion layer (subsidence inversion) by dragging the label up and down. If the inversion layer is above cloud base, cumulus clouds will form. If you set the inversion layer below the cloud base, only blue thermals will form.

Note: Thermals have some persistence and will not stop immediately after reaching the inversion height.

Just below the inversion line is the overdevelopment setting. As you make the inversion height greater than the cloudbase, the clouds will get bigger. Bigger clouds have a greater chance of producing rain, and very large overdeveloped clouds will also have thunder and lightning.

Cloud base variation

You can specify the spatial variation of cloud base. If the variation is low, the clouds will have nearly equal cloud base height. If the variation is high, cloud base heights will be more scattered.



Strength

Here you specify general strength of the thermals. The strength also depends on cloud base height. The higher the cloud base, the stronger are the thermals.

Strength variation

Here you specify the strength variation between individual thermals. If the variation is low, all thermals will have nearly equal strength. If the variation is high, strength difference between thermals will be high.

Width

The width of the thermals.

Width variation

Width variation of the thermals.

Activity

The activity (number) of thermals.

Activity variation

Activity variation of the thermals.

Turbulence

Here you specify the turbulence caused by thermals. Thermal turbulence also depends on thermal strength.

Note: The spacing of thermals depends on cloud base height. Lower cloud base causes more frequent thermals and vice versa.

Flats activity

In mountainous areas which adjoin flat land, it is common for there to be thermals in the mountains, but none on the flat land. This setting lets you inhibit flatland thermal activity.

Streeting

When there is a reasonable strength wind, thermals can form into long lines downwind from the source(s). This is called cloud streeting.

Bugs

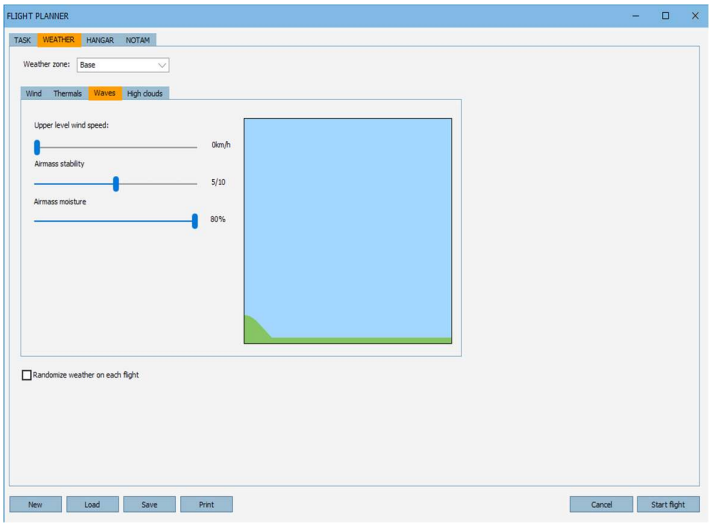
Sets the bugs accretion rate. More bugs on the wings degrade the performance. Bugs can be cleaned by using the bugwipers which are available in Condor 3 XC for some planes.

Randomize weather on each flight

On every flight, the weather will be randomized within the weather preset limits.

Wave Panel

With the right conditions and mountains to trigger, lee waves are formed downwind. This panel allows you to set up those conditions.



Upper level wind speed

Sets the wind speed above the inversion level.

Airmass stability

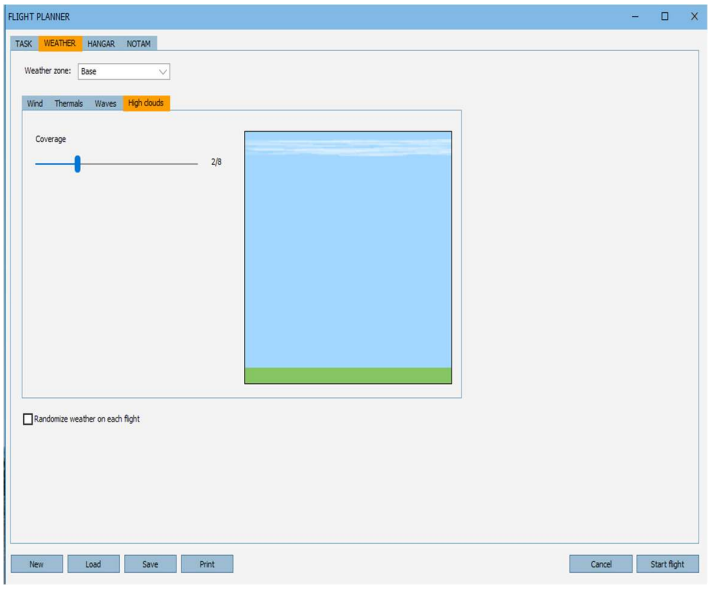
A more stable airmass gives stronger waves.

Airmass moisture

With more moisture, lenticular clouds will form. With low moisture, there will still be wave, but more difficult to locate and soar.

High clouds panel

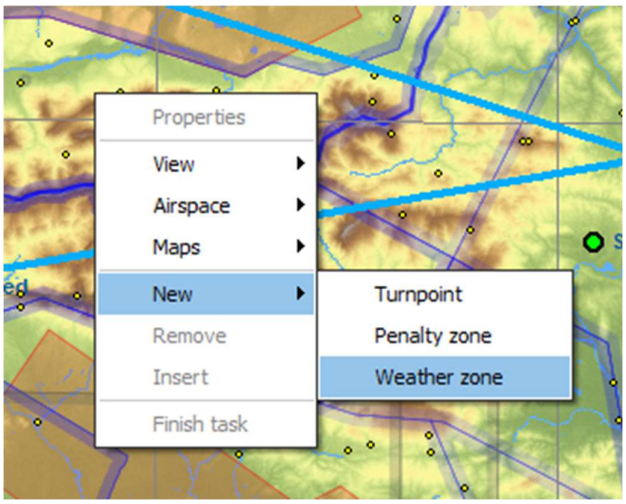
The high clouds (or cirrus) can be set with this control.



4.3 Weather Zones

New in Condor 3 are Weather zones.

Zones are created by drawing them in the flight planner window. Right click on the map and a box will appear.



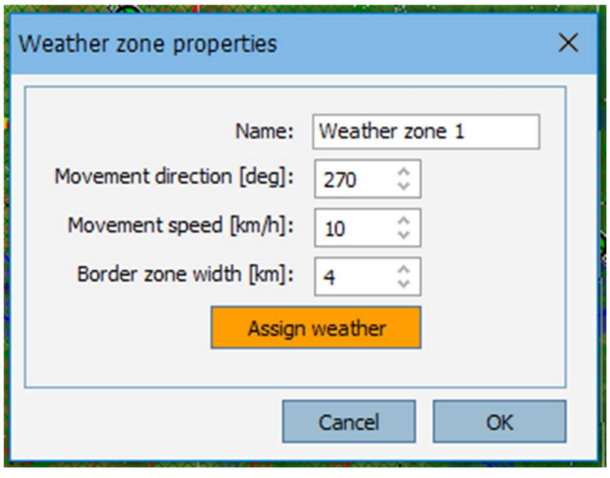
The base weather is the weather for the whole scenery. It It can be overridden by any of the weather zones.

Weather zones can be overlapping, in which case, Zone 1 has priority over zone 2, Zone 2 has priority over Zone3 and so forth..

Each zone will move during the task at a speed and direction selected in Properties.

The Border between zones smoothly transitions the different conditions from one zone to another.

The Zones have full control of all their weather parameters as previously described.



4.4 Glider selection and set-up: HANGAR tab

In this tab you choose the glider and alter its settings. Condor is supplied with a small selection of gliders, and there are many more available on the website for purchase and download.

Plane class

Here you define FAI competition class. Classes are not handicapped, except the "All" class and Club class which are handicapped.

Plane type

Here you define the type of the glider.

3D view

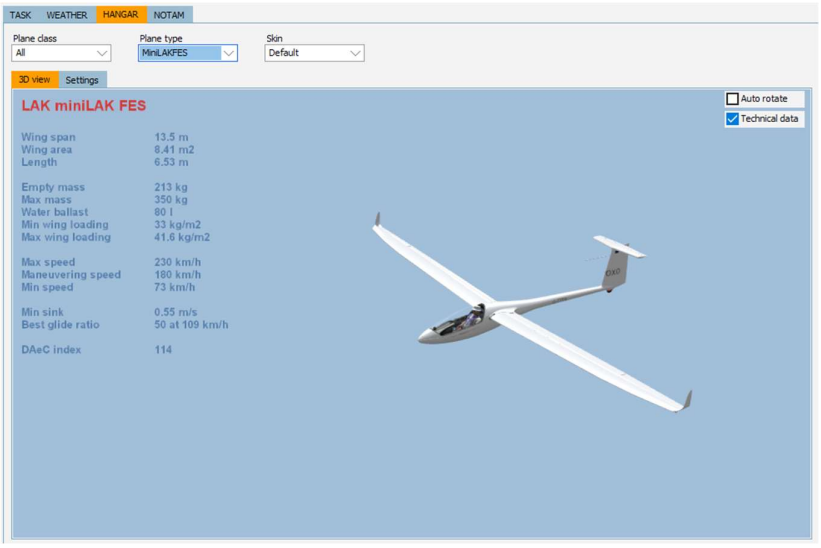
You can rotate and zoom the glider by dragging with left or right mouse button.

Auto rotate

Here you choose if the glider rotates automatically.

Technical data

Show basic technical data.

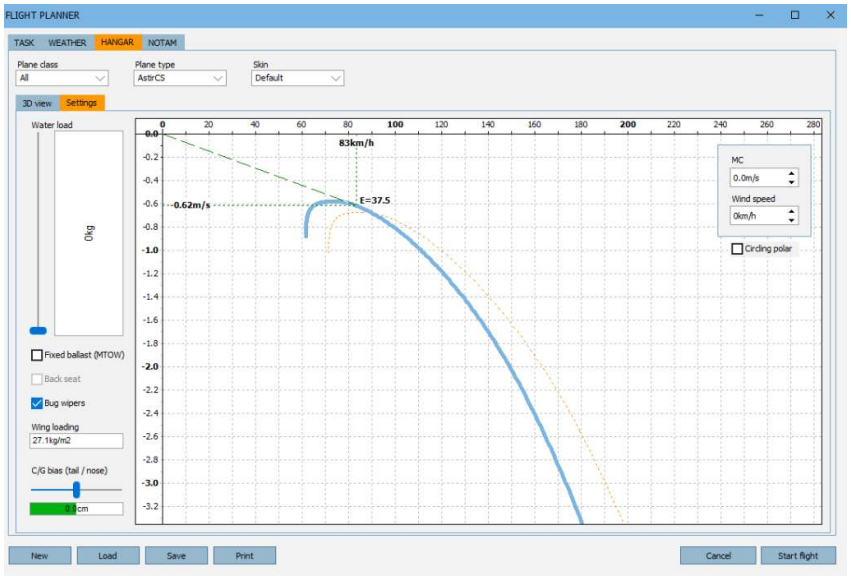


Settings

In this sub-tab you can see the speed polar of your glider. The thick blue line represents the polar with current water ballast amount. The dotted lines represent the polars for no water ballast and for full water ballast respectively.

Water load

Here you specify the water load amount. The speed polar changes accordingly. Please note that when Club class is selected, water is not allowed. If you would like to fly club class planes with water, you must select them from All class.



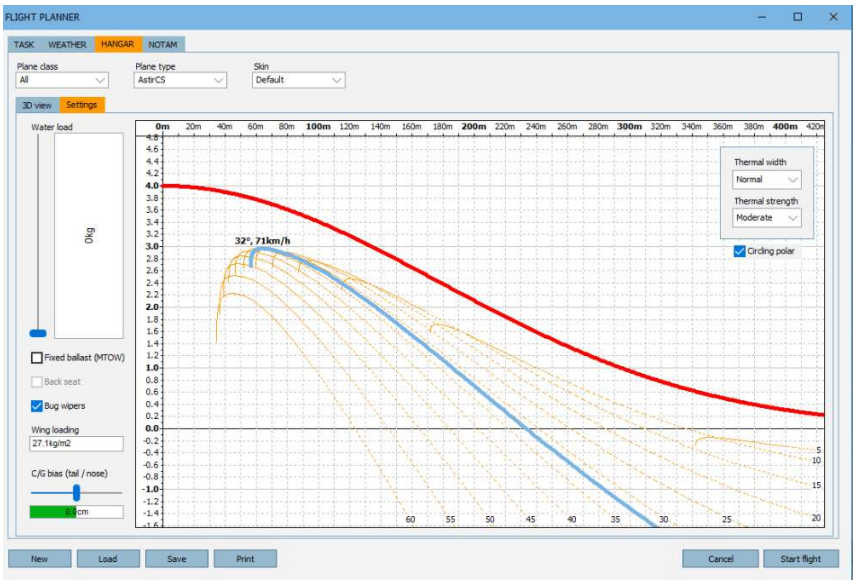
Fixed ballast / Two pilots (MTOW)

For single-seaters, this allows to set the plane weight to MTOW, if this is not possible with full water-ballast.
For 2-seaters, also lets you choose if there is a pilot in the rear seat.

The wing loading box will show the wing loading according to your selections.
The value will be green if it's below the maximum value set in the NOTAM tab, red otherwise, in which case starting the flight will not be possible.

Circling Polar

Check the box on the right and the display changes to the circling polar.This shows the optimum bank angle and speed to use for different thermal size and strength at current wing loading.



Back Seat

For 2-seaters, lets you choose to fly the glider from the back-seat.

Bug Wipers

When gliders are in flight, they accumulate bugs on the leading edge of the wings. These bugs degrade the performance of the glider. All gliders in Condor collect bugs. Some have bug wipers to clear away the bugs and thereby restore the original performance.

So, during flight, take a look at the wings occasionally to check for bug accumulation if if it's bad, activate the bug wipers. Default key is “,”

There are speed limits for bug wipers. They only operate between 50 and 125km/h (IAS - 27 to 67 knots). If you operate them above 150 km/h (81 knots) they will be damaged and you won’t be able to use them in this flight.

Note, not all planes have bugwipers, so with those you have to accept the performance loss.

C/G bias

Here you specify the relative position of your plane’s centre of gravity (C of G). The influence of this setting on performance is very small. The more important effect is glider handling.

MC

This setting does not influence your flight in any way. It’s provided to visualize the effect on optimal glider speed.

Wind

See MC.

Note: For more information on glider speed polars and settings see Flight school's advanced lessons.

Skin

Here you define the skin of the glider. Some are supplied with Condor, and you can also make your own design.

Making custom skins

Some pilots like to have custom graphics on the tail fin, but the standard Competition number (CN) and Flag would obstruct that. To fix this, its possible to disable the flag and CN from displaying.

Simply name your skin with -CN to disable the CN and -FL to disable the flag e.g. Myskin-CN-FL.dds

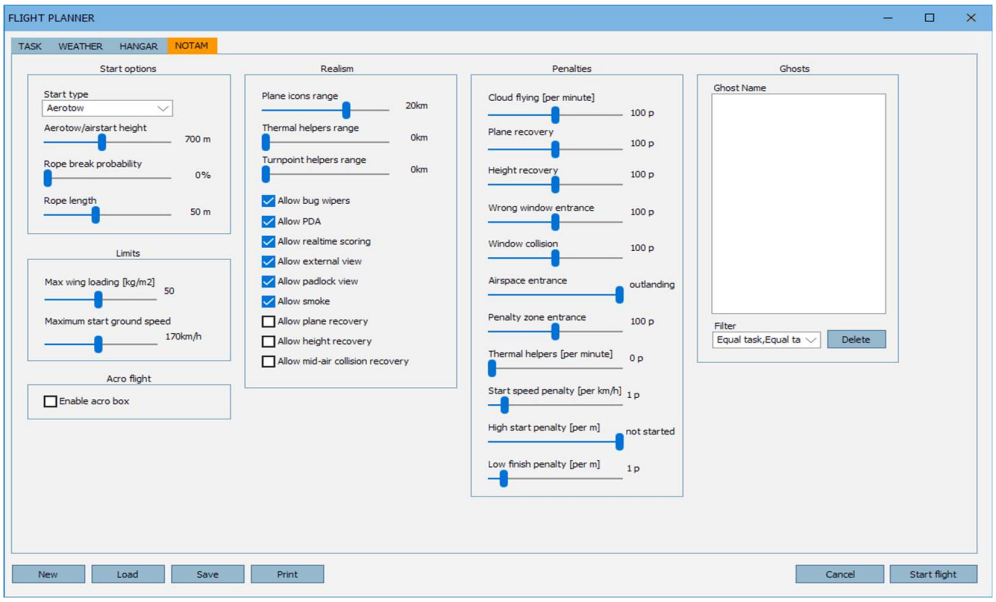
Read more about skins and how to use them on the Condor website *(www.condorsoaring.com/forum).*

4.5 Flight settings: NOTAM tab

In this tab you define various flight options.

Start type

Choose from aerotow start, winch start or airborne start.



Aerotow/airborne height

Specify the height of the aerotow or the starting height when starting airborne.

Rope break probability

Specify the probability of the rope break during winch launch.

Rope length

Adjust the length of the aerotow rope between towplane and glider. Long tow ropes are easier to fly for beginners.

Max wing loading

Adjust the maximum wing loading for the task. This will limit the quantity of water that can be put in the water ballast (Hangar tab).

Max start ground speed

Adjust the maximum ground speed at which you may cross the start line

Plane icons range

Select how far you see icons of other planes. To turn icons off, move the slider all the way to the left.

Thermal helpers range

Select how far you can see thermal updrafts as visible puffs. To turn off thermal helpers, move the slider all the way to the left.

Turnpoint helpers range

Select how far you can see turnpoints as vertical stabs and other visual task indicators like penalty zones. To turn off turnpoint helpers, move the slider all the way to the left.

Allow Bug wipers

Check this checkbox to allow the use of bug wipers on modern competition gliders. With this option disabled, no-one will be able to use them.

Allow PDA (Flight Computer)

Check this checkbox to allow the use of Flight Computer in the cockpit of modern competition gliders. With this option disabled, you will also have to make a photo (screenshot, key “S”) of each turnpoint from the turnpoint sector. Your left wing and the base of the turnpoint pole must be visible in the photo.

Allow real time scoring

Check this checkbox to allow pilot to display the real time scoring during the race.

Allow external view

Check this checkbox to allow the pilot to use external cameras.

Allow padlock view

Check this checkbox to allow the pilot to automatically pan the view in direction of other pilots.

Allow smoke

Check this checkbox to allow the pilot to use smoke trails on wingtips.

Allow plane recovery

Check this checkbox to allow the pilot to recover the plane from structural damage.

Allow height recovery

Check this checkbox to allow the pilot to gain 500 m of height instantaneously.

Allow midair collision recovery

Check this checkbox to allow the pilot to recover the plane damage after mid-air collision.

Penalties

Penalty points are directly deducted from player score. You can specify the number of penalty points imposed for various infringements.

Cloud flying

Specify the number of penalty points for every minute flying in clouds.

Plane recovery

Specify the number of penalty points for recovering damaged plane

Height recovery

Specify the number of penalty points for height recovery

Wrong window entrance

Specify the number of penalty points for wrong direction of window type turnpoint rounding.

Window collision

Specify the number of penalty points for collision with turnpoint window borders.

Penalty zone entrance

Specify the number of penalty points for entering penalty zone. You also get penalty points when flying in penalty zone according to penalty zone properties setting.

Thermal helpers

Specify the number of penalty points for every minute of using thermal helpers.

Start speed penalty

Specify the number of penalty points for every km/h above the maximum ground speed.

High start penalty

Specify the number of penalty points for every metre above the maximum start altitude.
Move the slider to the right to disallow starts above maximum start altitude.

Low finish penalty

Specify the number of penalty points for every metre below the minimum finish altitude.
Move the slider to the right to disallow finishes below the minimum finish altitude.

Acro flight Enable acro box

Check this checkbox to see acro zone and ground marks.

Ghosts

Ghosts are recordings of your or other people's flights. In this panel you can select ghosts to escort you during your flight.

Filter

You can filter out the ghosts with different flightplan settings.

Note: Technically ghosts are flight track files (.ftr). You can save your flight track in debriefing screen.*

Click Start flight to start the flight.

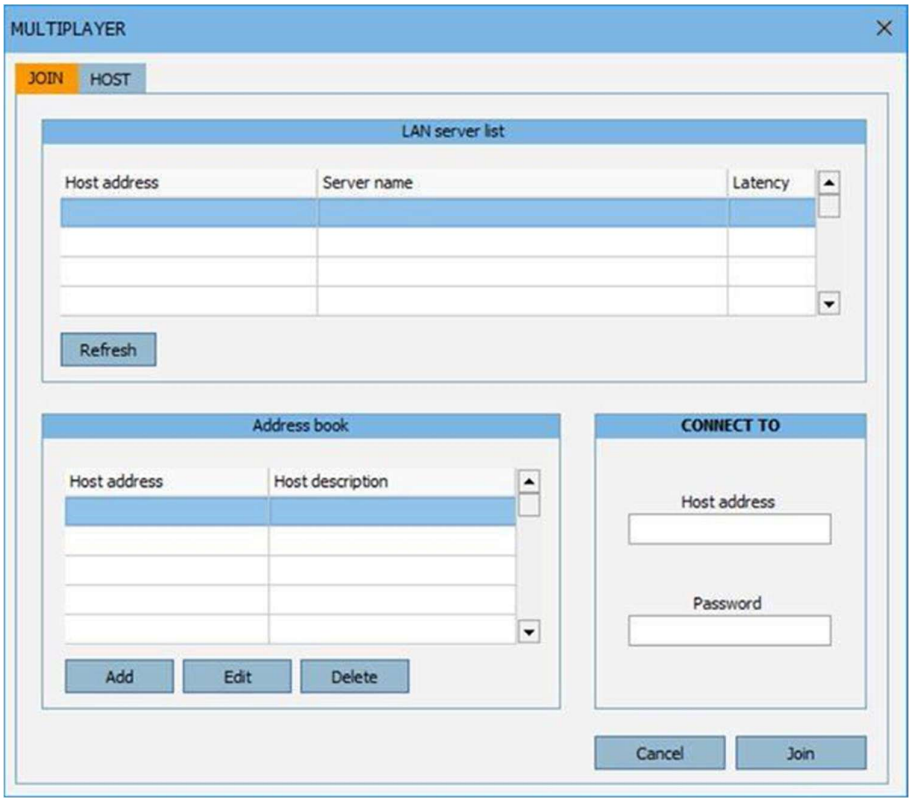
5 Multiplayer - flying with other pilots

Multiplayer allows you to fly or compete with other pilots using a LAN or Internet connection. You can join an existing Condor server or you can host a game yourself.

5.1 Join a multiplayer flight

LAN server list

If you would like to connect to a LAN server, you can use LAN server list to see the servers currently running on your LAN. Just click refresh to populate the list. Double click on the server to connect.



Address book

Address book is used to store server addresses that you often connect to. You can store LAN or internet servers. Double click on the server to connect.

Connect information

To connect to a new server, enter host address in the “Host address” field and click Join. Host address can be an IP address or a URL address. To connect to servers that are password protected, enter the password in the “Password” field.

Note: If for some reason a LAN server does not appear on the “LAN server list”, try connecting to it by explicitly entering host address in the “Host address” field.

When you join a server, you will automatically receive the flight plan from the server and enter Flight planner. The settings in Flight planner are controlled by the server and can not be changed, except for your plane settings.

Note: Only planes from server defined plane class can be selected. If server creates a teamplay race, you must also set your team in Planes tab.

In the Multiplayer tab you can see the list of connected players and chat with them. Click Start flight to start the flight.

5.2 Radio

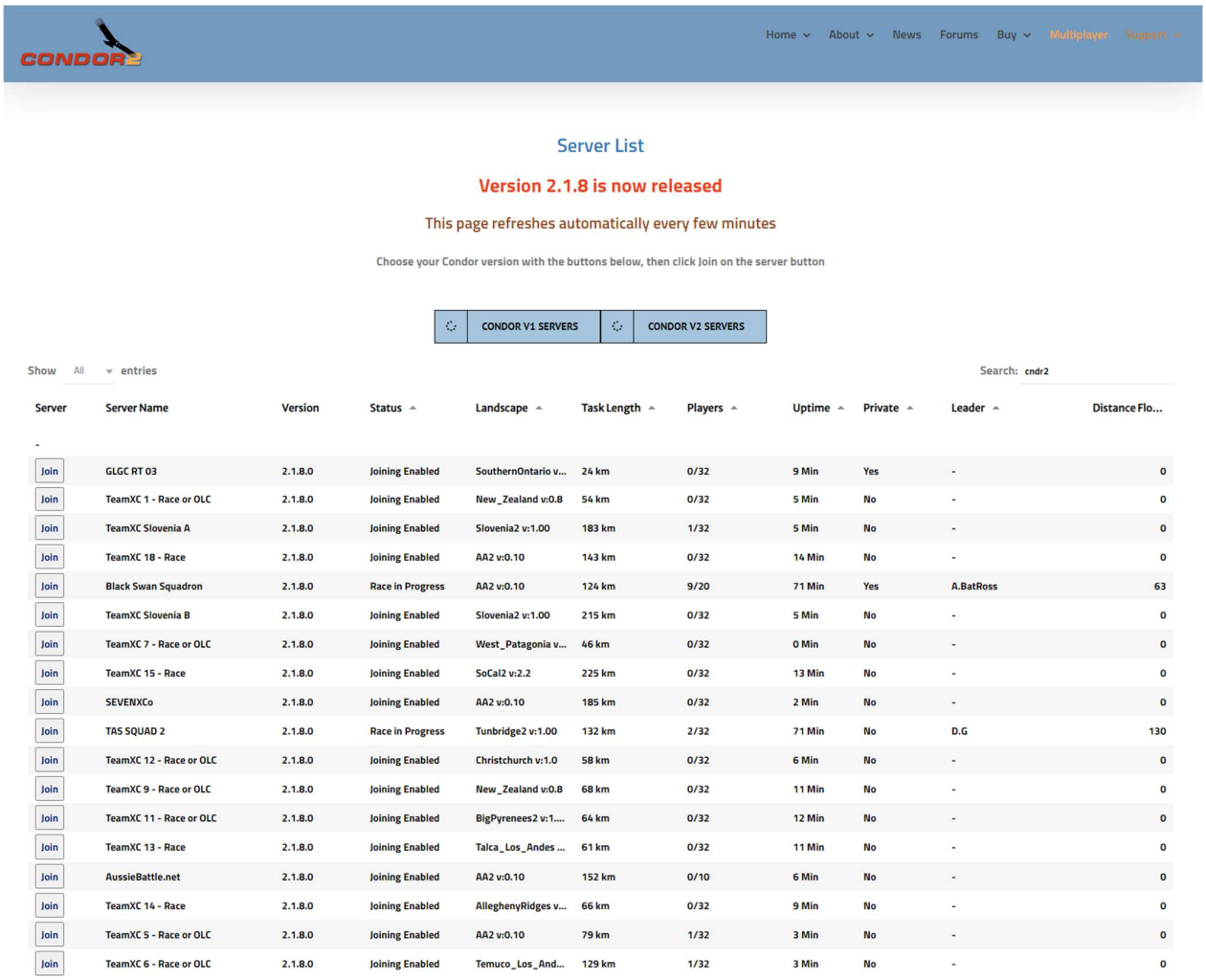
Condor 3 in Multiplayer has “radio” communication with the other pilots on the server. There are 50 frequencies available for use.

At startup, the radio is set to 123.50.
The frequency can by adjusted by using the “Radio frequency up” and “...down” keys (default==' and #).

Sound is always on and the volume is adjusted in the usual way. To talk, press and hold your PTT key. this can be mapped to the keyboard, or to a button on your joystick.

Advice: Please behave respectfully to other users on the radio. Server admins have the control and are able to ban you from the radio.

5.3 Internet flights



Server	Server Name	Version	Status	Landscape	Task Length	Players	Uptime	Private	Leader	Distance Flo...
-										
Join	GLGC RT 03	2.1.8.0	Joining Enabled	SouthernOntario v...	24 km	0/32	9 Min	Yes	-	0
Join	TeamXC 1 - Race or OLC	2.1.8.0	Joining Enabled	New_Zealand v:0.8	54 km	0/32	5 Min	No	-	0
Join	TeamXC Slovenia A	2.1.8.0	Joining Enabled	Slovenia2 v:1.00	183 km	1/32	5 Min	No	-	0
Join	TeamXC 18 - Race	2.1.8.0	Joining Enabled	AA2 v:0.10	143 km	0/32	14 Min	No	-	0
Join	Black Swan Squadron	2.1.8.0	Race in Progress	AA2 v:0.10	124 km	9/20	71 Min	Yes	A.BatRoss	63
Join	TeamXC Slovenia B	2.1.8.0	Joining Enabled	Slovenia2 v:1.00	215 km	0/32	5 Min	No	-	0
Join	TeamXC 7 - Race or OLC	2.1.8.0	Joining Enabled	West_Patagonia v...	46 km	0/32	0 Min	No	-	0
Join	TeamXC 15 - Race	2.1.8.0	Joining Enabled	SoCal2 v:2.2	225 km	0/32	13 Min	No	-	0
Join	SEVENXCo	2.1.8.0	Joining Enabled	AA2 v:0.10	185 km	0/32	2 Min	No	-	0
Join	TAS SQUAD 2	2.1.8.0	Race in Progress	Tunbridge2 v:1.00	132 km	2/32	71 Min	No	D.G	130
Join	TeamXC 12 - Race or OLC	2.1.8.0	Joining Enabled	Christchurch v:1.0	58 km	0/32	6 Min	No	-	0
Join	TeamXC 9 - Race or OLC	2.1.8.0	Joining Enabled	New_Zealand v:0.8	68 km	0/32	11 Min	No	-	0
Join	TeamXC 11 - Race or OLC	2.1.8.0	Joining Enabled	BigPyrenees2 v:1....	64 km	0/32	12 Min	No	-	0
Join	TeamXC 13 - Race	2.1.8.0	Joining Enabled	Talca_Los_Andes ...	61 km	0/32	11 Min	No	-	0
Join	AussieBattle.net	2.1.8.0	Joining Enabled	AA2 v:0.10	152 km	0/10	6 Min	No	-	0
Join	TeamXC 14 - Race	2.1.8.0	Joining Enabled	AlleghenyRidges v...	66 km	0/32	9 Min	No	-	0
Join	TeamXC 5 - Race or OLC	2.1.8.0	Joining Enabled	AA2 v:0.10	79 km	1/32	3 Min	No	-	0
Join	TeamXC 6 - Race or OLC	2.1.8.0	Joining Enabled	Temuco_Los_And...	129 km	1/32	3 Min	No	-	0

Joining an online flight is much simpler than LAN flight, because we host a server list at http://www.condorsoaring.com/serverlist/

Open the link using your pc browser and the serverlist will be displayed.

Click on “CONDOR V3 SERVERS” to have the list display only those servers which are hosting Condor 3 flights. When the list refreshes, you can choose whichever you want and click on the JOIN button. This will start Condor 3 and you can then continue and set up your chosen plane, then enter the sim.

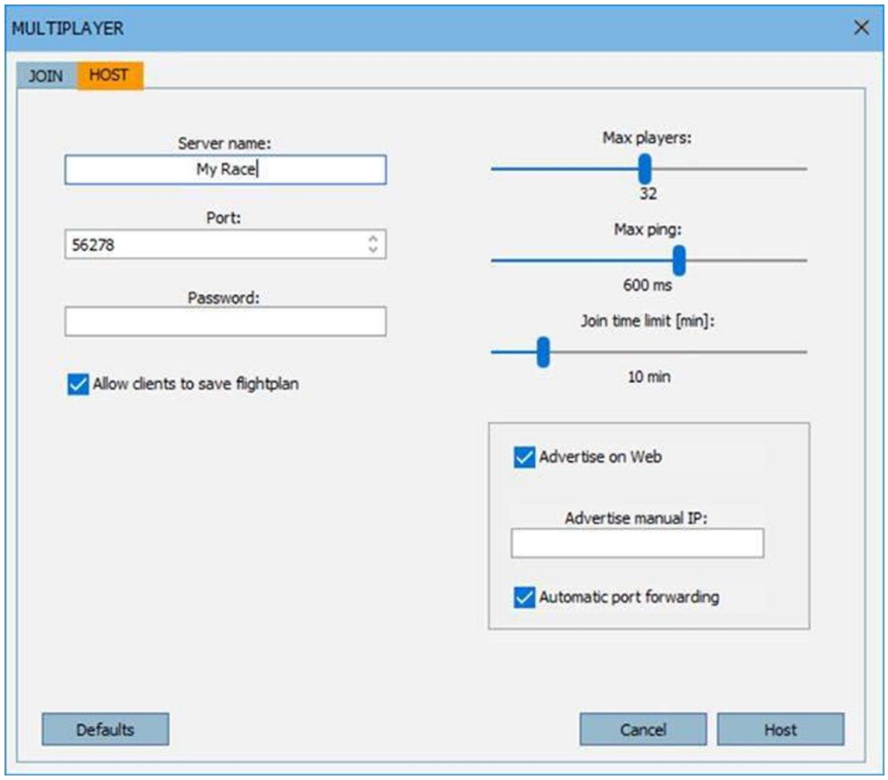
Note: Remember to check that you have the landscape needed for that flight before joining.

Hosting a flight for others to join

Hosting a server can require a high amount of bandwidth. This is usually not a problem on LAN connections. But if you intend to host an internet game, be sure to have a fast and reliable ISP connection, especially if you expect a lot

of pilots to join.

Note: When you host a game, players from LAN or from internet can connect at the same time.



Server name

Here you specify your server name (not address), that is visible to connecting players.

Port

Set the router port that the server will use to host the game.

Password

Set the password if you wish that only players that know it can connect to your server.

Max players

Set the maximum number of players that can connect to your server. More players require more bandwidth. Setting the slider all the way to the right allows unlimited players. Be careful with this, as it will be possible to exceed your bandwidth and make Condor unplayable for the connected pilots.

Max ping

Set the maximum ping to prevent players with bad internet connection to spoil the party by warping.

Join time limit

Here you specify how long new players can connect to game (minutes). This option is only used in multiplayer.

Advertise on web

Here you specify if the server description is advertised on the Servers list of the Condor website.

Advertise manual IP

If your IP address is not correctly propagated to the Servers list, you can manually enter the IP that will be advertised on the Servers list.

Note: By default, Condor uses port 56278. Do not alter this setting if you don't need to. For more information on ports, firewalls, NATs etc. visit Condor's website at www.condorsoaring.com.

When you click Host, you will enter Flight planner. Define the flight plan for the hosted game as you would in free flight mode. There are, however, some changes in NOTAM tab.

Max towplanes

Set the maximum number of towplanes.

Teamplay

In teamplay, every pilot will be part of a team and the winning team will be the one with the highest score. The team score is computed as an average of scores of all players within the team.

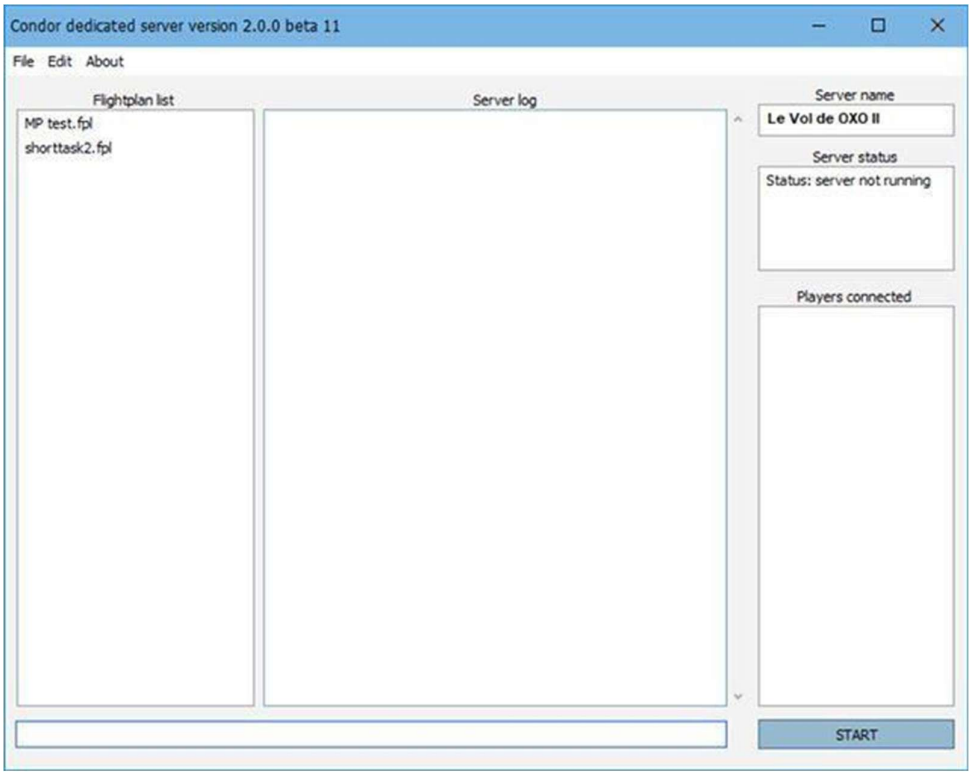
Number of teams

Here you set the number of teams. If you don't want to use teamplay, drag the slider all the way to the left. Click Start server to start the flight.

5.4 Stand alone server

Dedicated server is a standalone executable and a part of Condor installation. The purpose of dedicated server is to host Condor multiplayer games on a standalone PC (Win 2000, Win XP or Server 2003).

Dedicated server is designed to cycle a list of flight plan files (*.fpl), defined and saved with Condor's flight planner.



Setting up a flightplan list

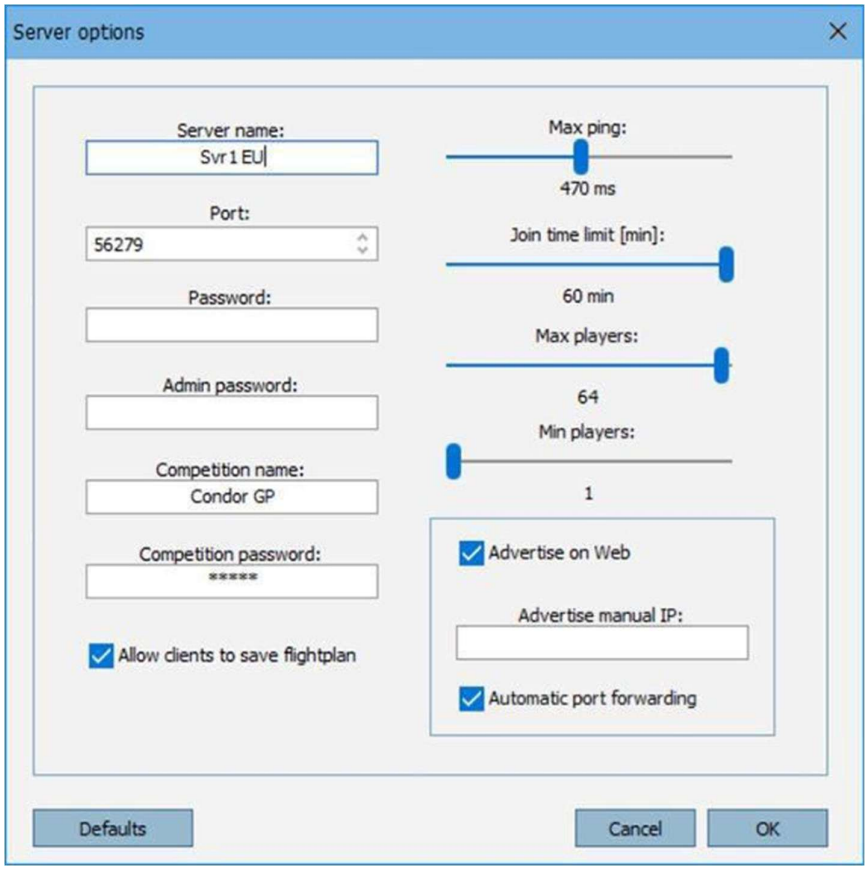
To setup a flight plan list, add flight plans from the context menu by right-clicking the 'Flightplan list' and choosing 'Add flightplan'. The order of flightplans in the list can be changed by dragging them up or down. Individual flightplans can be deleted with 'Delete flightplan' command from the context menu.

The flightplan list can be saved to flightplan list format (*.sfl) and loaded later. Only *.fpl references are saved to this file format, so moving flightplan lists to another computer is not wise.

Server options

The settings are similar to the normal server setup. There are three additional options:

Admin password: Here you set the dedicated server administrator password. If other clients know this password, they can become administrators with .admin dot command.



Competition name: Official competitions can be registered by contacting us by email at condorteam@condorsoaring.com). Such competitions can be shown separately on the web server list.

Competition password: Password protection for official competitions.

Running the server

The server is started and stopped with START / STOP button. When the server is running, you can enter admin commands and chat messages to the input line in the bottom of the screen. Press ENTER to send the message.

When the 'join in' time is over, the server automatically proceeds to then next flightplan in the list if the number of players drops below minimum player count, set in the Server Options dialog (Edit menu).

The server log is saved to CondorDedicatedLogFile.txt file in Condor /Logs folder.

5.5 Configuring your router

To host online races, it is necessary for your internet router to be correctly configured to allow access via numbered ports.

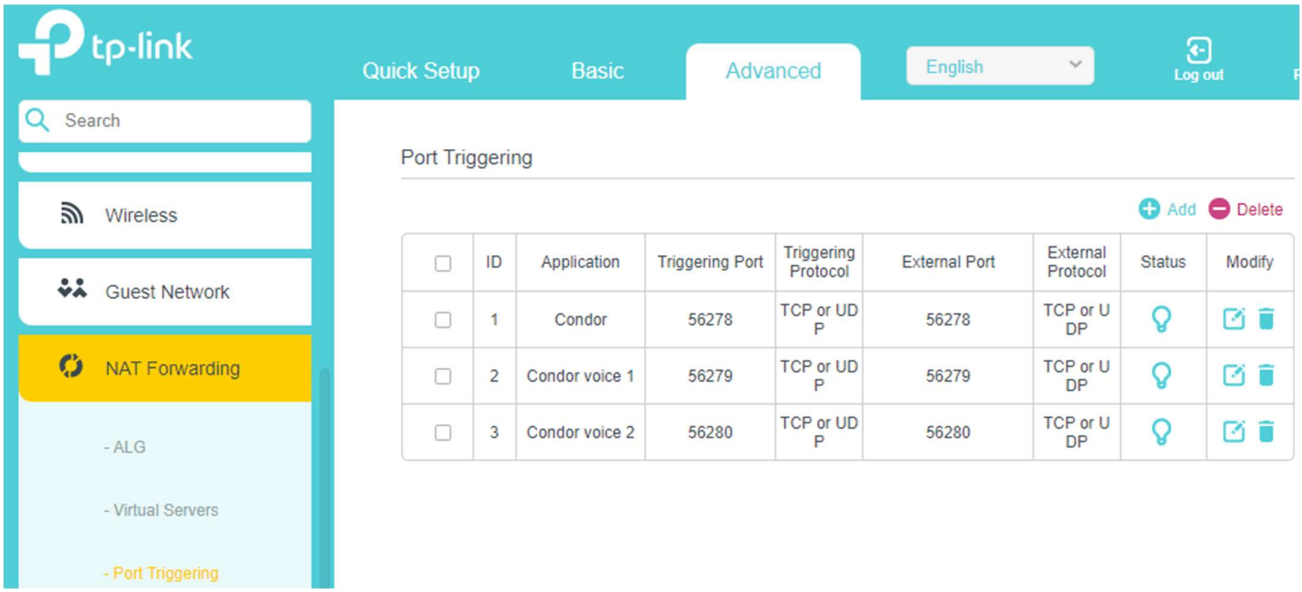
Note: Port forwarding is only needed if you host an online server.

The ports used by Condor 3 are by default, 56278, 56279, and 56280. All of these are required to be open to have full Condor 3 functionality.

If you decide to use different ports, please ensure they are not conflicting with other application functions first, then enable 3 sequentially numbered ports. e.g. 57000, 57001, 57002

Note: We strongly recommend that you configure your router manually to open these ports, because UPnP is both insecure and unreliable.

There are many different routers used across the world, and we can only show one example here. For further help please ask the community in the Condor forum.



Example:-

Possible problems with hosting

Unfortunately, for some internet connections it is not possible to host races. This is caused by the ISP using Carrier Grade Network Access Translation (CGNAT). This means that your public IP address is shared with other users, and the server cannot uniquely contact you. There is nothing we can do to get round this.

The solution for you is to ask your ISP to disable CGNAT on your line, or ask for a Fixed IP address connection.

5.6 Racing Online

Over the years we have seen many questions about racing rules.

1. Is it possible to land and then be relaunched?
   Yes

2. If yes, is there a particular place where I need to land?

Nearest airport to the launch location, or launch airfield if aerotow or winch are used as per FAI annex A 7.2.1

3. If airstart away from the airfield is used, can I still land and relaunch

Yes, at the nearest airport to the launch location

4. Is there a limit to how many times I can relaunch?

Yes, it is 3 launches on a competition day as per FAI annex A 7.3.1. The first airstart already counts as the first launch, so 2 restarts from the airfield are allowed.

5. If the start gate is closed can I still land and relaunch?

Yes, but your racetime will start running from the time the start gate closed

6. Will my penalties reset if I restart the task? If yes, all of them or just some of them?

Penalty for starting high and starting too fast resets on crossing the startline again, unless it is a regatta.

7. If I have already turned the first turn point can I still go back, land, relaunch and restart the race?

Yes, but you have to land and restart from the airfield. Note the maximum of 3 launches on a competition day.

8. Can I start and restart the race if the startgate is already closed?

Start yes (not previously crossed the startline for a valid start), Restart no.

9. What happens if I cross the finish line below the minimal altitude or above the maximal altitude?

Below minimum altitude: Depending on task settings either not finished, or penalty points
Above maximum altitude: Not finished.

6 Multicrew

Condor 3 introduces a major new feature which allows you to have dual pilots in a 2-seater glider.

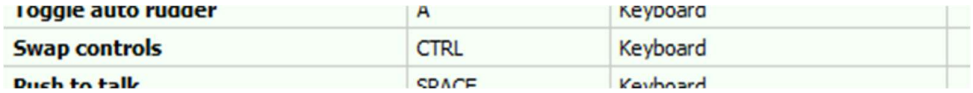
The two pilots can connect locally over a LAN, or remotely over the internet. For internet operation, it's vital that both connections are high speed and have low Ping values.

One pilot is designated as “P1”, “pilot in command”, or Instructor, and he has control over which pilot is flying the glider.

P1 pilot hosts, or joins a multiplayer server with “2 pilots” enabled. P2 pilot then joins the same server and requests to enter the P1 plane.

P1 then can either deny or accept the request.

Once the sim is entered, there is full time audio between the two pilots so they can discuss the flight etc. Pilot 1 has control over who is in control of the glider, and he can pass control to the Pilot 2 using the Swap controls key.



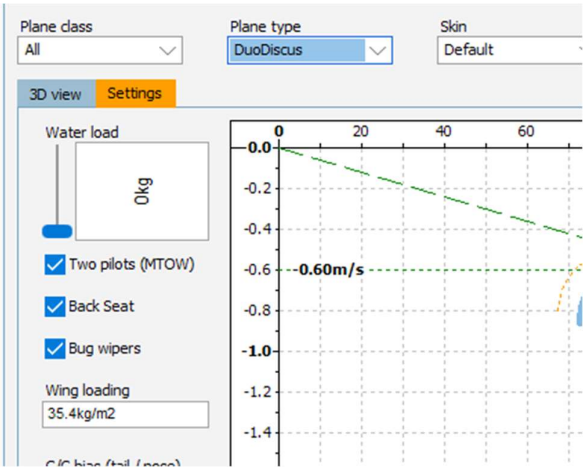
When P1 wants control returned, he uses the swap controls key again.

Note: The server to host a Multicrew flight must be using the Dedicated Server (DS) app (CondorDedicated.exe) which you will find in the Condor folder. It's not possible to use the self hosting in Condor.

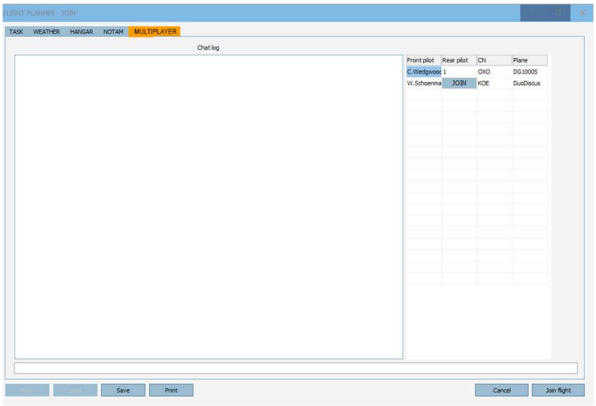
6.1 Hosting the flight as P1 or Instructor

It is similar to regular multiplayer.

- Join the server.
- Go to Hangar and select your 2-seater.
- In settings, select Two pilots, and then choose your seat.
- Now you wait for the student to join and request access to the other seat. When he does, you will get a popup asking to accept or refuse him in the P2 seat. If you accept, then he will be joined, and all you need to do now is click Start flight and both of you will enter the sim.



6.2 Joining a flight as P2 or Student



- Join the server.
- Don't select a plane, go straight to the MULTIPLAYER tab
- You should see yourself and the P1/Instructor shown in the table. There may be other pilots there too.
- To join your instructor in the plane, click on Join
- The instructor will then accept you into the plane and enter Condor simulation on both your and the instructor's PC.

Control of the glider will initially start with the P1/Instructor, and he will pass control to you when he needs.

Note: To avoid bad consequences, it is good practice to always tell the other pilot when control is passed across:

"I have control"

"You have control"

7 Instruments

7.1 Air Avionics Aircontrol display

Display of the radio frequency, altitude and pressure setting.

7.2 LZ FES controller

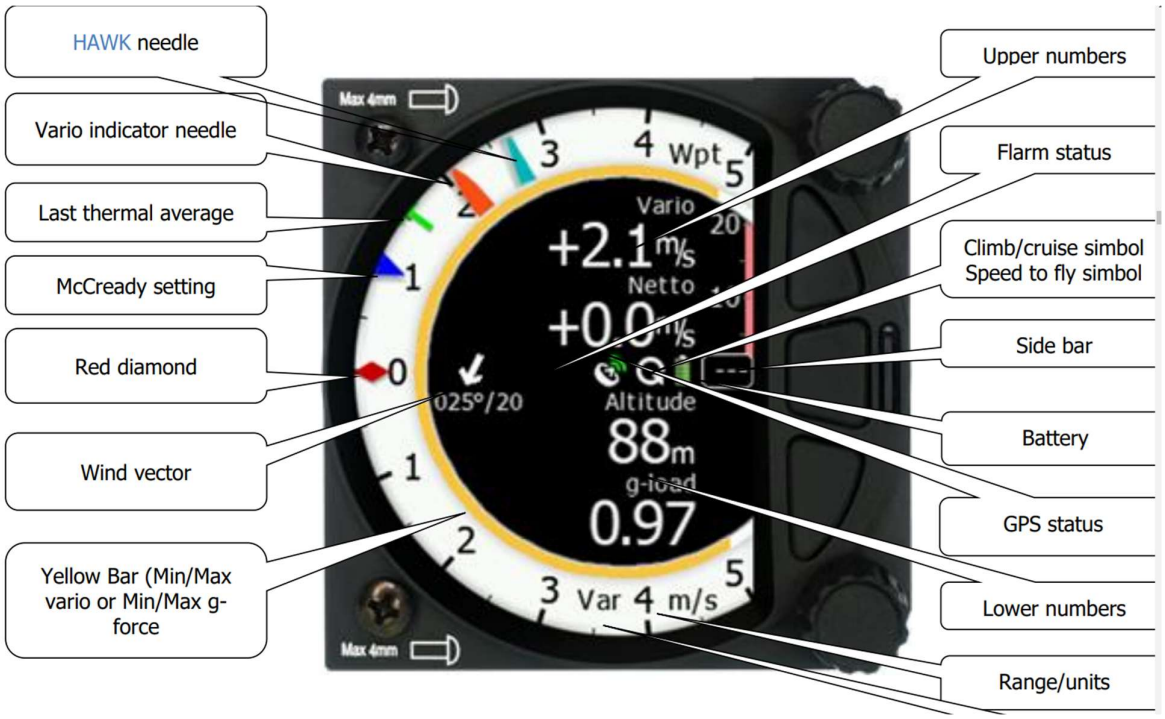
This is the motor controller for gliders with the FES motor system.

It controls the deployment and speed of the propeller. The display shows the current draw, the propeller RPM, and the remaining battery power.

7.3 ILEC motor controller

Controls the the motor deployment, starting, and speed.

7.4 LXNav S10



In Condor the telltales on the scale are:

Green T: Current or last thermal average

Red diamond: This thermal 30 second average

Blue triangle: MC setting

Hawk

If you have the HAWK addon there will be two needles displayed, and the HAWK wind display page will be available.

The large dark blue arrow is the instantaneous wind and the light blue or white arrow is the average wind.

Red needle is the standard Total Energy, and Light blue is the Hawk processed value.

The variometer audio can be connected to TE or Hawk. See the Condor Setup page to select that.

For detailed information on the S10, please see the LXNav website at https://gliding.lxnav.com/

7.5 LXNav V8

In Condor this is the same as the S10, but without the volume controls. usually its used in conjunction with an S10 to have a different display showing.

7.6 FLARM

FLARM is a collision/proximity warning system.

The instrument in Condor is driven by code supplied by FLARM which replicates their detections and alarms.

The circle of lights show the direction, and the vertical bar shows the relative altitude.

When there is an alarm, the display flashes red and there are audible alarm sounds.

For further information please go to https://www.flarm.com/

7.7 Flight computer

Most planes in Condor have a flight computer with a moving map and calculations to assist you in executing your soaring flight. To make it easier to see, you can zoom in on the panel by holding the “Panel zoom”key (default=Y).

The Condor Flight Computer has 3 screens. The screens are selected by using the “LX stick up / flight comp up” and “LX stick down / flight comp down” keys. (default=NUMPAD 8 & 2)

To zoom in/out use the “LX stick left / flight comp zoom out” and “LX stick right / flight comp zoom in” keys (default=NUMPAD 4 & 6)

To change the display of the map and airspace use the “LX stick / flight comp mode left” and “LX stick / flight comp mode right” keys (default=NUMPAD 7 & 9)

Glide screen

Select this to display a moving map with your turnpoints.

The next turnpoint (or start/finish zone) is displayed in red, and will turn green when you pass through it. If the turnpoints have altitude limits, they will be marked as text in the zone. Start will turn yellow to indicate you are inside the zone.

There are 3 types of zones: The start zone will be red (Start not armed), Yellow (Start armed), Green (Start successful), Normal turnpoints: Red (Active turnpoint), Green (Turnpoints that have been turned, or still have to be turned). AAT sectors: Red (Active turnpoint sector), Yellow (Sector armed), Green (Sectors that have been turned or still have to be turned).

Airspace is shown in blue, red or green. A popup will be displayed and alarm will sound if you infringe the airspace.

The vertical red line at the top of the screen shows the heading to the next selected turnpoint.

The horizontal red line at the right side shows the above/below glideslope to the selected turnpoint. Note that this does not account for any obstacles such as hills, mountains and tall trees which may obstruct your path.

Lower left is a wind arrow, and the wind direction/strength.

Lower right is the map zoom level showing the width of the map display in km.

At the bottom of the screen is the digital data panel.

Dis is the distance to the selected turnpoint

DH is your current altitude above (or below) the turnpoint

GS is ground speed

DDH is the estimated height above the turnpoint at which you will arrive.

E is the currently achieved Glide ratio

ReqE is the glide ratio needed to reach the turnpoint

The values change as you cycle through the turnpoints using the “Flight computer next TP” and “Flight computer prior TP” (default=PgUp and PgDn)

Information Screen 2

The red line shows the direction to the next turnpoint. When the line is in the centre of the screen, you are flying directly towards the turnpoint.

tTime is the task time. The time since you started the task.

tSpd is task average speed.

hAGL is height above ground.

TTG is time to the selected turnpoint, taking MC into account.

GS is ground speed.

tDelta is your delta to the arrival time in an AAT. If it is negative you arrive too early, if it is positive you will arrive too late.

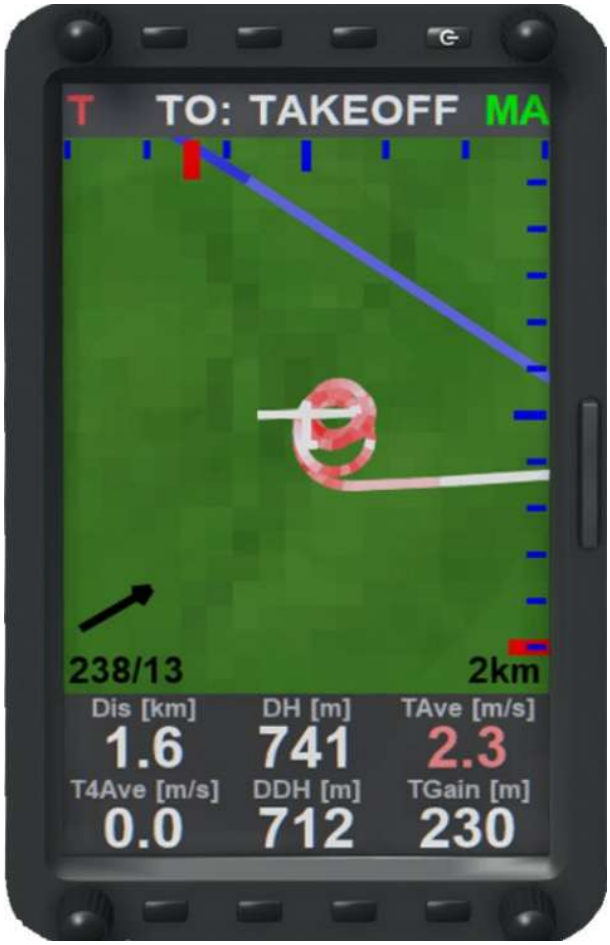
With the “Flight computer next TP” and “Flight computer prior TP” keys (default=PgUp and PgDn) you can calculate time and arrival height spanning multiple waypoints. The top of the screen shows which TP you are calculating to.

On the map, the turnpoints are numbered, and the Takeoff(T), Start(S), and Finish(F) are similarly labelled.

Thermal Screen 3

The thermal helper will be displayed with a coloured track.

The thermal helper shows your flight with a trail in different colors to represent vertical speed, which can help you centre a thermal or locate wave.



Red is climbing, blue is descending.

Dis is the distance to the selected turnpoint

DH is your current altitude above (or below) the turnpoint

DDH is the estimated height above the turnpoint at which you will arrive (or above minimum altitude if it is set).

TAve is the average climb rate in this thermal

TGain is height gained in this thermal

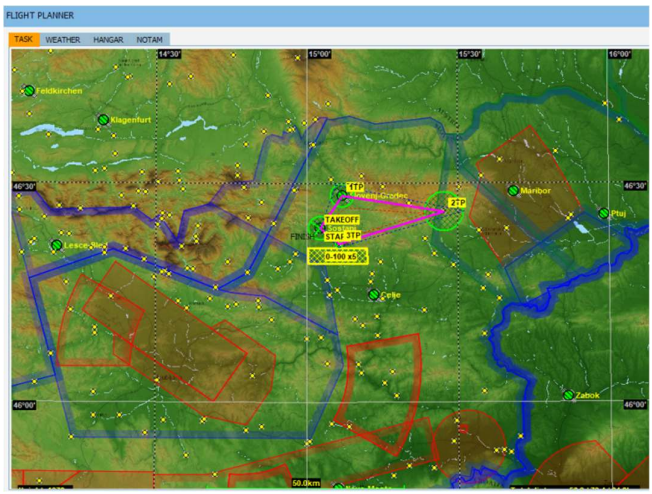
T4Ave is the average of the last 4 thermal climbs

Airspace

Each landscape can have an airspace file. These are open source and usually supplied by the landscape designer.

Sections of the airspace can be disabled in the flight planner, and this is the recommended procedure.

The airspace file can be edited to add or delete airspace sections. Refer to the Internet on how to do that, but this is not recommended for most users because airspace is checked in multiplayer tasks and you will be blocked if you have a different airspace file to the task server.



Airspace is displayed in the flight planner and on the Flight Computer. Airspace colours depend on airspace class. Airspace which extends down to the ground is shaded in red.

BLUE is Class C and D

GREEN is Class E

RED is all other airspace

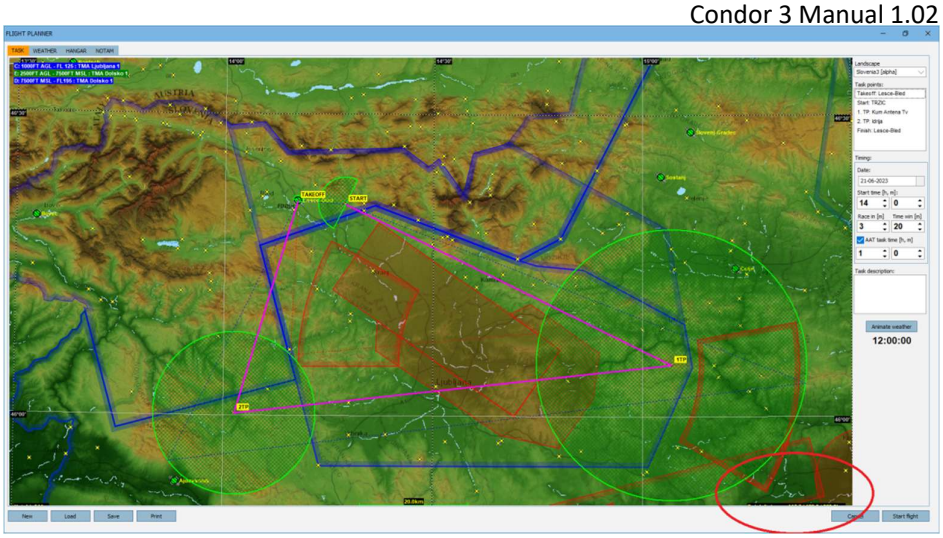
Penalty zones

These are shown in yellow on the flight computer.

7.8 Using the Flight Computer to fly an Assigned Area Task (AAT)

The goal of an AAT task is to fly the highest average speed, just like a normal racing task. However the way this average speed is calculated differs from a racing task in that the exact routing is not given to the pilot in advance. The routing is something you have to come up by yourself. You are given a couple of “assigned areas” and a minimum time in which to visit all areas in the correct order and return to the finish.

Your average speed is calculated via the optimum distance you cover using straight lines between the furthest point in each assigned area divided by your actual time over the task. Note that if you fly shorter than the minimum time your distance covered will be divided by the minimum time, not your actual time. So you will lose average speed by being too early.



The preparation starts in the flight planner window. Have a good look at the weather, the area you are flying in and the plane you will be using. With this information try to estimate the average speed you are going to be able to fly. On the right side of the task window in the flight planner you will see the AAT task time also known as T-min. This is the minimum time your distance will be divided by. The distance you should plan to fly is thus your estimate of the average speed times the T-min. For example, if you estimate you will fly 100 kph and the T-min is 1:30 you should plan to fly 150 km.

To plan your route you can drag the magenta lines in the AAT sectors by holding down shift and moving the turnpoints with the mouse. In the bottom right of the map you will see the task distance changing. To help you plan, there are dotted blue and red lines. The blue lines will give you the maximum possible distance, and the red lines minimum distance. If possible, choosing a route that avoids airspace and mountains will in general give you the fastest possible speed.

As a general rule you want to make sure that you finish as close as possible, but later than, the T-min. This makes sure your final glide, where you usually fly at high speed is the largest possible part of your flight. To ensure you can fine tune your arrival time, plan some “wiggle room” in the last sector. If you arrive early because you are flying faster than planned you can extend your flight further into the sector to have some extra distance. If you come up late you can turn sooner to be as close as possible to T-min.

Once you are satisfied with the placement of your individual turnpoints it is time to start flying. Your individual turnpoints are automatically set as the flight computer turnpoint targets. All calculations the flight computer does are via the individual turnpoints as planned in the flight planner.

An AAT task starts just like a racing task by crossing the start line at the correct height after the window opens. As soon as you cross the line your T-min counter will start counting down. You can use the Info screen of the flight computer to see how long you have been flying and at what average speed. While flying you have to estimate if the distance you are planning to fly is still ok for the average speed you are achieving. Use “Flight computer next TP” and “... prior TP” (default= PGUP and PGDN) to scroll through the turnpoints and look if the distance remaining is still sufficient, or maybe a bit much. If you think you need to adjust one of the turnpoints press the "Move AAT turnpoint" key (default=right SHIFT), “move AAT point“ will show on the screen. Then use the “Flight computer next TP” and “... prior TP” buttons to select the desired turnpoint then move it with the LX STICK UP/DOWN/LEFT/RIGHT keys (default=NUMPAD 2, 4, 6 &8). Once you are done press the the "Move AAT turnpoint" key once again
The distance and glide information will change in real time using the new position of the turnpoint targets.

Once you enter a sector you have to decide when it is time to turn. A sector you enter will turn yellow, and you will get a message in the chat. This arms the “Handheld advance TP” button (default /). When you press this button navigation will advance to the next turnpoint. Note that this action cannot be undone. Pressing this button does not affect your scoring. The scoring will always calculated via the most optimal route. So if you accidentally press it too early, you can still fly further into the sector if you want.

Once you are on the way to your final sector it is time to start fine tuning. On the info screen of the flight computer you can find tDelta. This is an estimate of your arrival time compared to the T-min. If you arrive early this will be negative. If you arrive late it will be positive. The number takes into account your MC setting and still air to the

finish via the turnpoint targets. The goal is to have this number be a few seconds positive when you have a DDH to the finish of 0. That is the most optimal point to turn your last sector.

A few tips:

- If your final glide goes very well and you see that you finish a few minutes early, don't worry. Just fly to the finish conservatively and finish early. Your time will be divided by the T-min anyway so there is no way to improve your average speed any more. It is best not to mess up and finish later than the T-min as that will drop your average speed.
- If your average speed is low, but you see it is increasing it might be beneficial to fly longer than the T-min and try to improve your average speed. This can happen if, early in the task you get low and have to climb in a weak thermal, but find superb conditions further into the task.
- Try to plan your flight so you can fly shorter or longer than your planned route. You might misjudge the weather. If you turn sectors early in the task too short there might not be enough distance in the remaining sectors to get your task time over T-min. Or if you fly too far in the early sectors, you may go over T-min and you have no way to take a shortcut.
- Most of the time it is best to be as close as possible to, but above T-min. Your final glide will almost always increase your average speed because you don't have to climb any more. By making this part of your flight the biggest possible part of the flight you will usually get the highest average speed.
- Try to fly courses that are as straight as possible. Flying a large arc through a sector will increase the ground distance you cover, but the calculation of your distance is only taken on straight lines between a single point in each sector.

8 LX9070 Flight computer

If enabled in setup – options, it takes over from the Condor Flight Computer in all planes which have the Flight computer on the panel. The separate flight computer attached to the cockpit side is not affected.

The LX9070 has additional features to the Condor Flight computer and is worth investigating for those.

The 9070 is exactly the same as the real life instrument. We suggest you use the LX9070 manual from the LXNav website.

https://gliding.lxnav.com/

To use the LX9070, you must enable it in Setup - Options

Note: The LXSim from the LX website is different and does not integrate with Condor.

It opens automatically. After it is loaded, you can move it to a second screen if you have one, where it will display the same as the LX9070 in the glider.

When using the LX9070 in the Tsk, Wpt or Apt screens, pressing the LX "Enter" key will bring up a menu list which gives access to all the functions usually performed by the 8 buttons set around the LX display screen.

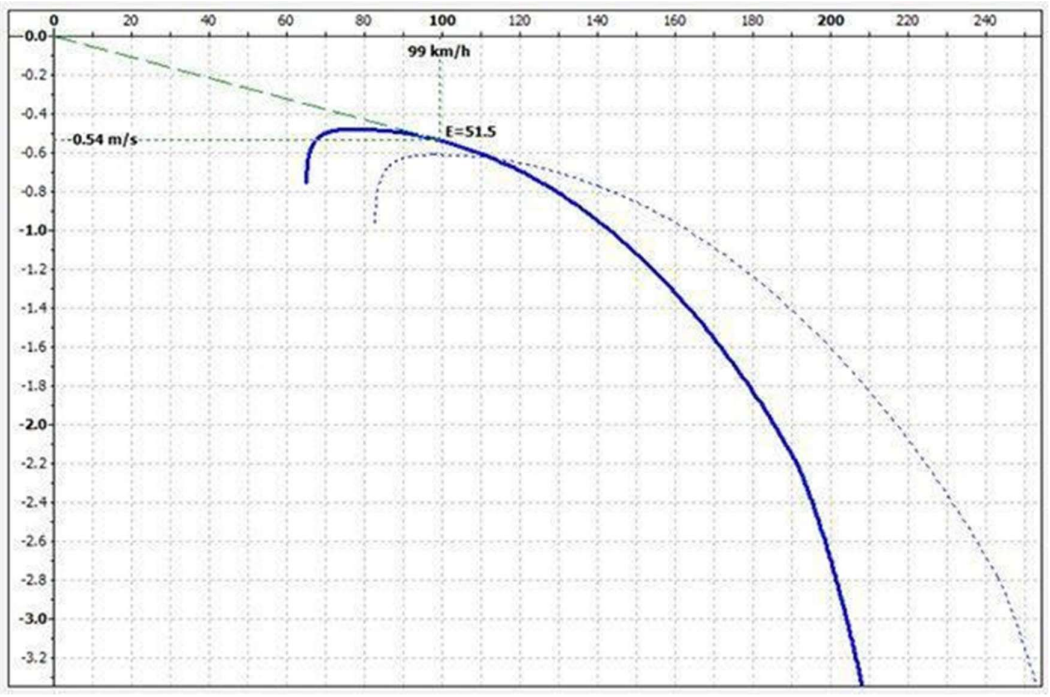
9 Soaring theory

Introduction to soaring

Soaring is one of the purest forms of flying. It uses no internal power sources, only energy from the moving air, just like soaring birds. In still air, the sailplane sinks slowly to the ground, but if the air is rising, the sailplane is rising with it. The true beauty of soaring is trying to understand natural phenomena that cause vertical air currents which allow the sailplane to stay aloft.

There is, however, some energy needed to bring the glider high enough to start using those air currents. Today, the most common form of launching a sailplane is aerotowing. With aerotowing, the sailplane is connected to a motored towing plane with a tow rope.

Sailplane performance



Speed polar

The performance of the sailplane is best described with the speed polar. The speed polar is a graph of speed vs. vertical speed.

There are several important points on the speed polar:

Minimum speed

The point of minimum speed is the leftmost point on the polar curve. A sailplane can not fly below minimum speed, because it can not produce enough lift to counteract the weight of the sailplane. Minimum speed should be as low as possible as it means shorter landings and lower radius of circling in thermals.

Minimum sink

The point of minimum sink is the topmost point of the polar curve. If the glider flies at this speed, it will have the lowest sink speed. Obviously, the minimum sink speed should be as low as possible and it should be obtained at lowest speed as possible.

Best glide

At specific speed, called speed of best glide, the glide angle is the shallowest. If the glider flies at this speed, it will fly the furthest. We can get best glide angle by drawing a tangent to the polar through the origin of the axis system.

Glide ratio

The ratio between speed – v and sink speed – w is called glide ratio – E:

$$E = v / w$$

From a diagram of forces it can also be shown that glide ratio is ratio between lift force – L and drag force – D.

$$E = v / w = L / D$$

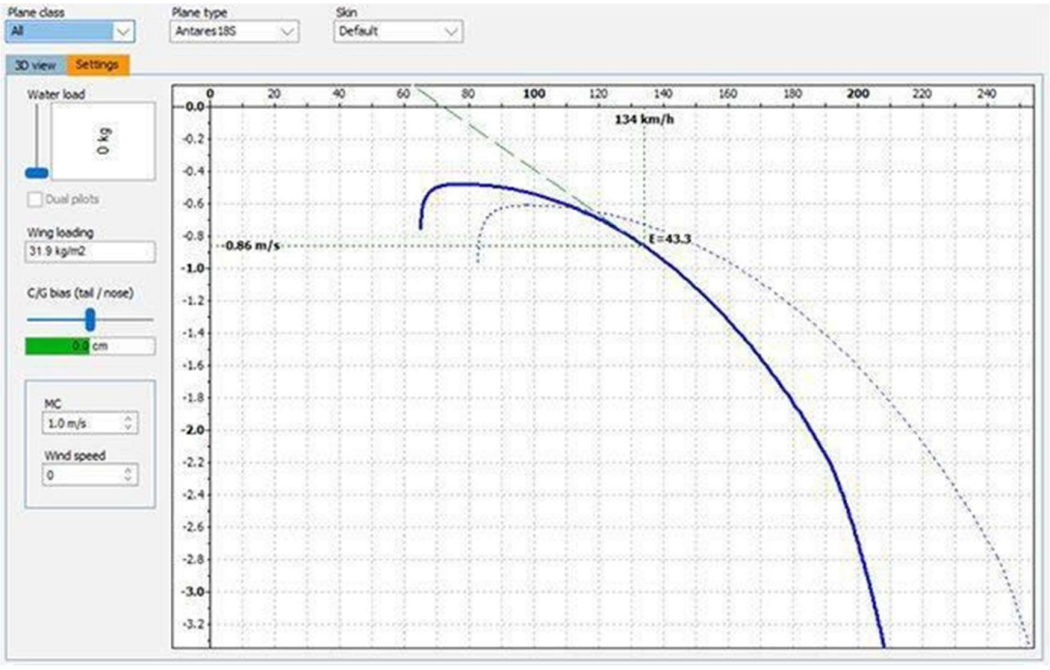
We can get the glide angle from glide ratio as follows:

$$\tan(\theta) = E$$

Typical glide ratios of modern sailplanes range from 40 to over 60. That means that in still air the sailplane will fly 60 kilometers from 1000 m height before it will reach the ground.

MC theory

When flying between updrafts, soaring pilot has to decide how fast he will fly. If he is flying only to stay aloft, then he might choose the speed of best glide to cover as much distance as possible. This will give him the greatest chance of finding another updraft. But if he is flying cross country or in a competition, he will want to achieve the highest possible average speed.



So he might fly as fast as possible to the next thermal – but this will not give him the highest average speed as he will lose a lot of time gaining height again. He might fly with the speed of best glide – again he will not have the best average speed. This time, he will lose too much time to reach the next thermal. The optimum speed is somewhere in between.

To find the optimal speed, Paul McCready (1956 world champion in a Breguet 901) invented the “optimal speed

theory", later known as MC theory. According to this theory, to compute the optimal speed between updrafts, you need three things:

– the speed polar of your glider

– the vertical speed of the air that you are currently flying through and

– the expected rate of climb in the next updraft

The speed polar is known and the current vertical air speed can be measured by instruments. Today, using modern electronic equipment, these parameters are automatically entered into the flight computer. The pilot only has to enter one more value: the expected rate of climb in the next updraft. Usually, this value is called MC value or simply MC. The output from the flight computer is the optimal speed to fly to achieve the highest average speed.

Graphically, the speed to fly is found by drawing the tangent to the polar from the point of expected rate of climb.

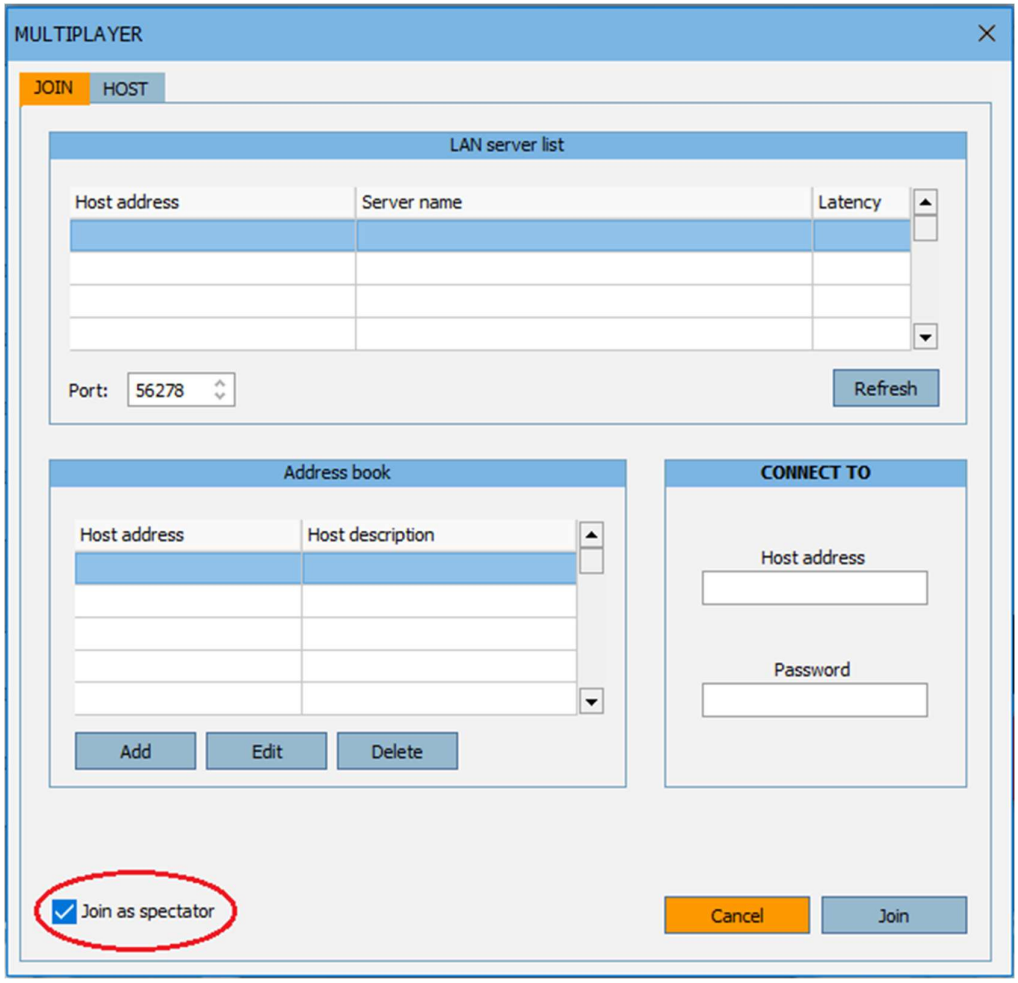
Finding optimal speed to fly

We are expecting to climb 1 m/s at the next updraft and we can see that the optimal speed to fly is 134 km/h. It can also be shown that the average achieved speed is the point where the tangent cuts the speed axis, in our case around 72 km/h.

10 Spectator mode

Spectate! allows you to watch online Condor races. It is a way to do live commentary, or just watch a race, or your favourite pilot. It is also a useful training tool to do flight training or cross-country coaching. You are even able to join a server as spectator even after the jointime has expired.

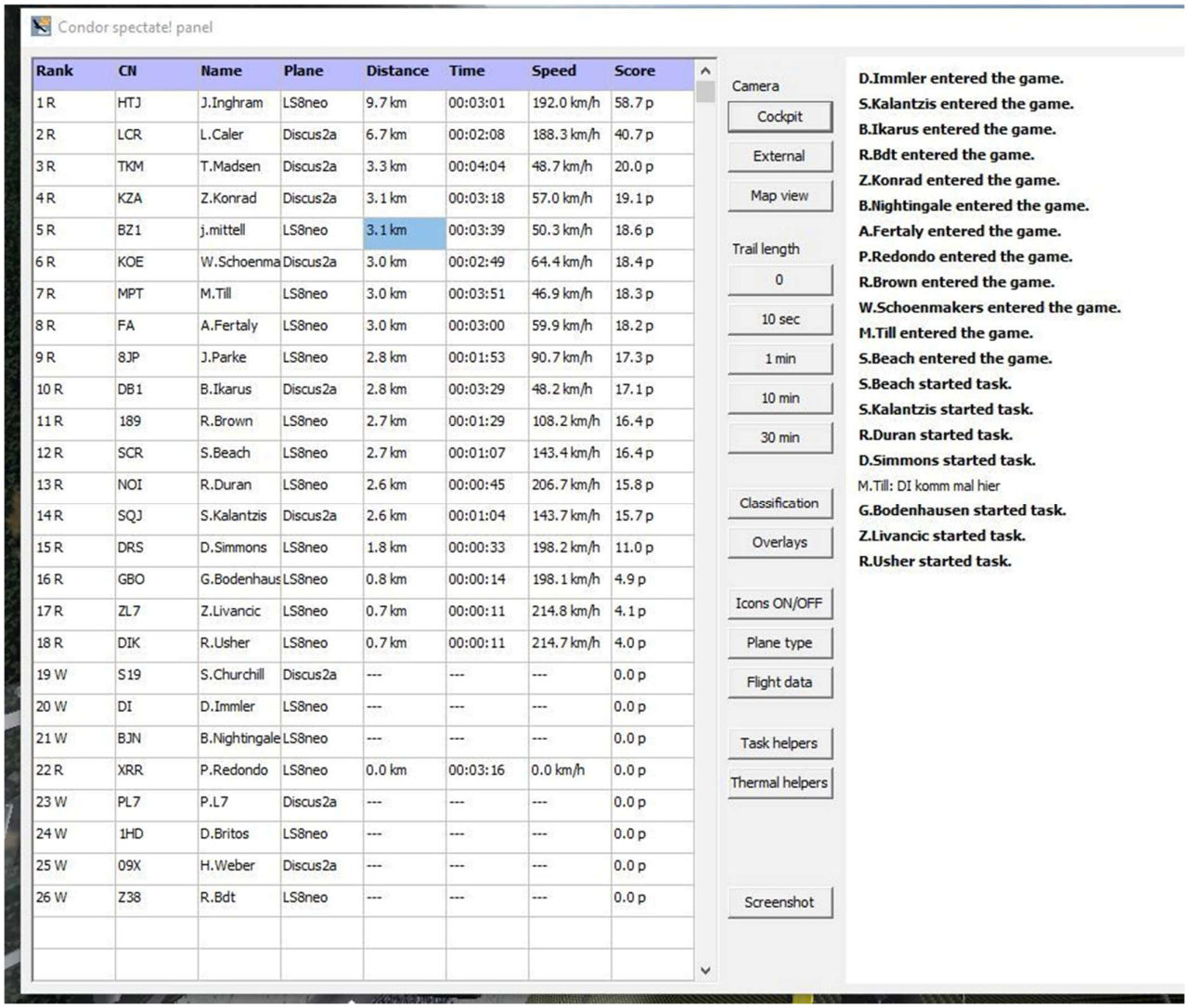
You can use Spectate! on any server in the serverlist (You still need the password if the server is private). You can also join servers as spectator from your address book or by manually entering the server address in the field in the multiplayer window in Condor. To join as Spectator, tick the checkbox “Join as spectator”.



Note: That the host may have limited the number of spectators or turned off the ability to use spectate.

After you join you can see the task information like you would see if you join as a player. Selecting a plane has no effect except that if you choose a plane without Flight Computer (like the Grunau Baby or SG38) you will not see the Flight Computer of other players.

When you click on Join flight, Condor will load and a new window will open.
This is the Spectate! Panel. This allows you to Control the display in Condor.



Ranking

Here you see a list of all connected pilots. Clicking on a pilot in the list will switch the camera to this pilot. You can sort the lists by the different columns by clicking the blue labels at the top.

Cockpit

Shows the selected pilot's cockpit view .

External

Shows the selected pilot's external view .

Map view

Shows a top down view centred on the selected pilot.

Trail length

Turn on trails behind the pilots. You can select different lengths. Each pilot will have his own colour.

Classification

Turns on the on-screen classification table in Condor.

Overlays

Removes the chat and bottom information bar from the screen.

Icons ON/OFF

Turns off the glider labels.

Plane type

Toggles the glider type display in the labels.

Flight data

Toggles between distance, altitude, speed and climb rate in the labels.

Task helpers

Turns on the turnpoint helpers (always shown at maximum range, independent of the FPL NOTAM settings)

Thermal helpers

Shows thermal helpers when enabled by the task setter in the NOTAM tab.

Screenshot

Takes a screenshot

Camera area

Area displays the in game chat. It is also used to move the in game camera around. Controls are the same as in game. Left mouse button to pan the camera, right mouse button to move the camera forwards and backwards.

JSON output

Condor (when connected in Spectate! mode) can act as a HTTP server on localhost, serving JSON files with data about all pilots in the race. The default port for HTTP requests is 8080, but can be changed with the Spectate.ini file which should be put to the Condor\Settings folder. The content of the Spectate.ini file is as follows:

[General] Port=8081

Usage:

http://localhost:8081/selectedPilot

http://localhost:8081/allPilots

The JSON data can be used in software like OBS Studio to create real time overlays about the selected pilot or all pilots.

Example output (carriage returns are added for clarity)

{
“ID”:”3103807898?,
“CN”:”JD”,
“RN”:”F-CTJD”,
“firstname”:”Jean-David”,
“lastname”:”Thoby”,
“country”:”France”,
“plane”:”Ventus3-15?,
“latitude”:”45.53.345N”,
“longitude”:”013.53.071E”,
“altitude”:”118?,
“speed”:”70?,
“heading”:”268?,
“vario”:”0.02?,
“playerstatus”:”Warmup”,
“rank”:”1?,
“score”:”0.0 p”,
“penalty”:”0.0 p”,
“averagespeed”:”—“,
“dist”:”—“,
“time”:”—”
}

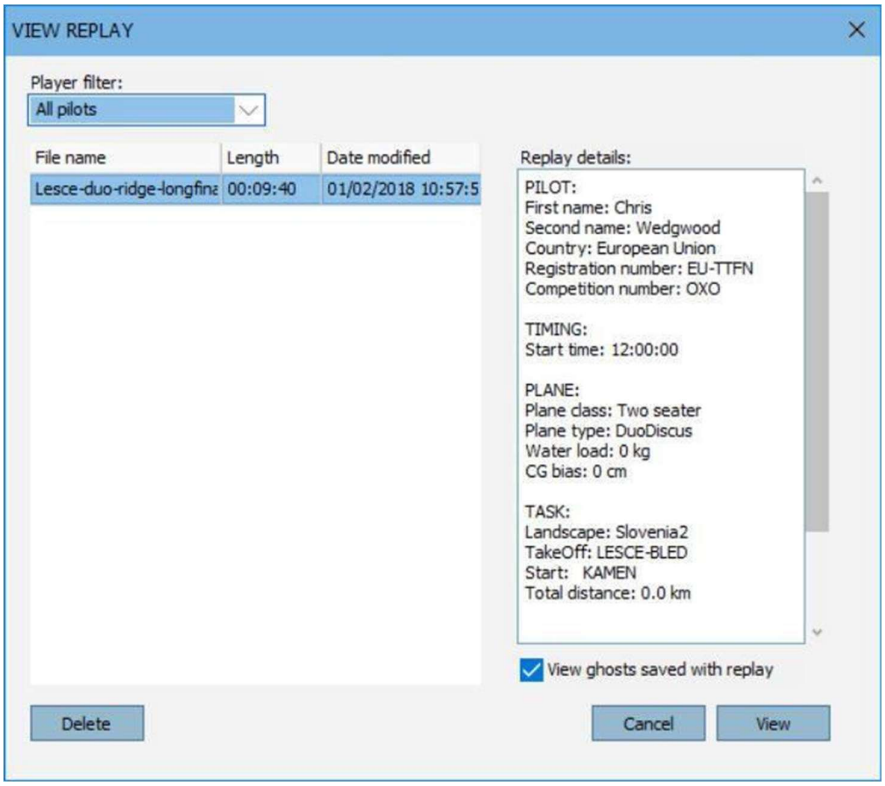
11 Flight Replay

Every flight can be saved and viewed later. You save the replay of your flight in debriefing room after flying. Replay files have the extension 'rpy' and are saved in the Documents/Condor/Replays folder of your virtualstore.

Note: Currently, multiplayer flights can not be recorded.

You can also get replays from other pilots, put them into your Documents/Condor/Replays folder and view them. To view a replay, click on View replay in the main menu.

Before you can change views when viewing a replay, you have to toggle replay camera/manual camera with the F9 key



Player filter

Only replays from selected pilot will be shown. If you want to view a complete list of replays in the folder, then specify 'All pilots'.

File name

Filtered list of *.rpy files in /Replay subfolder.

Length

Length of the replay.

Replay details

Replay details.

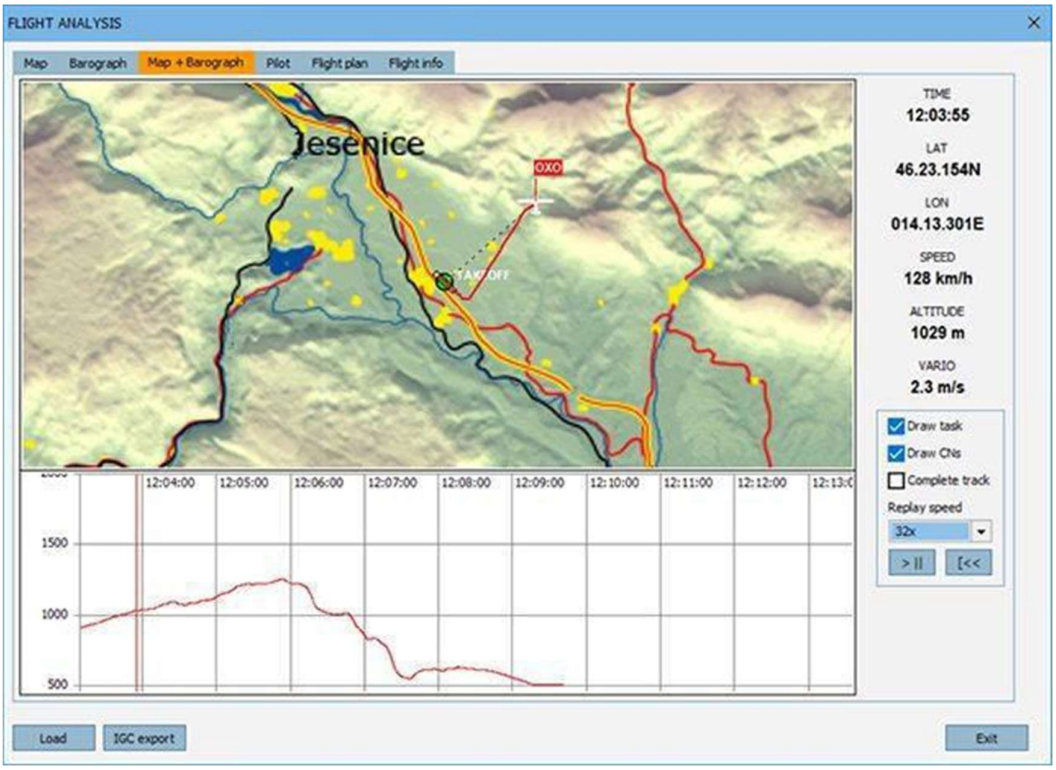
View ghosts saved with replay

View ghosts that were saved with replay.

Click View to view the selected replay.

11.1 Review and analyse your performance

You can analyse your flight by clicking ANALYSE FLIGHT from the DEBRIEFING menu or analyse saved flights by clicking FLIGHT ANALYSES in the main menu.



When entered from the DEBRIEFING menu, the Last Flight is already loaded (LastTrack.ftr). When you enter ANALYSE FLIGHT from the main menu, you first have to load your saved flight by pressing the load button and select a flight track file. Every time you load a file it is added to the window. So you can compare the track to other tracks. The menu has several tabs with different information stored in the flight track file. Barograph, Pilot info, Flight info and the Flight plan. If you press the play button the plane icon will move along your flight path.

Flight track files

You can save your flight to a flight track file (*.ftr) by clicking the SAVE FLIGHT TRACK button in the DEBRIEFING window that is visible after you exit your flight. If you forgot to save your flight track, you can use the 'LastTrack.ftr' file that is automatically overwritten every time you exit a flight. So if you need it, don't enter and exit an other flight without making a copy of it. Flight track files are stored in the Documents\Condor\FlightTracks folder of the current Windows User. They can be shared with other pilots or used as ghosts. They can also be used as a proofing tool for successful task completion or record flights.

IGC files

If you would like to export flight tracks to IGC format to view them with an external IGC file viewer, click IGC export in the FLIGHT ANALYSES menu.

Flight analysis options

When you right-mouse-button click in the window you can zoom and select different moments in the flight.

Draw task

Draws the task legs, turn points and sectors.

DrawCNs

Draws the competition number(s) of the glider(s).

Complete track

Draws the complete track. The track you already travelled is drawn with a thicker line.

12 In-game commands

Command	Parameters	Description
.d	-	delete last replay comment
.team	Red, Lime, Yellow, Blue, Fuchsia, Aqua, White, Black	Changes the current team (before race start)
.admin	Password	Add client to DS admins
.towinfo	-	Debug cmd if towplane doesn't start
.password	Password	Sets DS password
.listids		lists IDs of all players
.kick	ID or CN	kicks player from server
.stopjoin	none | minutes | inf	sets stop join time
.start	-	Starts launching

13 Simkits and UDP outputs

Condor features streaming of data like instruments readings and plane data to external applications which can use this data to move instruments and 3D motion platforms.

Condor natively supports Simkits hardware (www.simkits.com) and additionally provides generic UDP output for custom built instruments and cockpits.

Simkits support

Currently, four instruments are supported:

- airspeed indicator
- altimeter
- electronic variometer
- compass

Variometer data is sent out as »attitude_bank« parameter because some older Simkits controllers (SIC) don't support variometer natively. Just plug the variometer to attitude indicator connector.

Simkits.ini

Simkits output is enabled by setting »Enabled=1« parameter in the »Simkits.ini« file found in the Condor\Settings installation folder:

```
[General]
Enabled=1

[ScaleFactors]
 Vario=5
 Airspeed=1.944
 Altimeter=1
 Compass=1
```

With »ScaleFactors« you can calibrate the instruments so they correspond to actual values.

13.1 Generic UDP output

Condor can stream data to external applications using UDP protocol.

UDP.ini

UDP output is enabled by setting »Enabled=1« parameter in the »UDP.ini« file found in the Condor installation folder:

```
[General]
Enabled=1

[Connection]
Host=127.0.0.
Port=55278

[Misc]
SendIntervalMs=1
ExtendedData=0
ExtendedData1=0
```

```
LogToFile=0
```

In the same file host address and port are also set. Send rate is controlled by SendIntervalMs parameter which specifies the time interval between two consecutive data packets. Some additional parameters are available if ExtendedData or ExtendedData1 are enabled. The output can also be logged to file for debug purposes by setting the »LogToFile=1« parameter.

UDP Packet data

The data packet is an ASCII stream of 'parameter=value' pairs with the following parameters

Note: all values are floats with '.' as decimal separator

*: available only if ExtendedData=1 in UDP.ini
**: available only if ExtendedData1=1 in UDP.ini

Parameter	Value	Units
time	in game display time	decimal hours
altitude	altimeter reading	m or ft
vario	pneumatic vario reading	m/s
evario	electronic variometer reading	m/s
nettovario	netto variometer value	m/s
integrator	integrator value	m/s
compass	compass reading	degree
slipball	slip ball deflection angle	rad
turnrate	turn indicator reading	rad/s
yawstringangle	yawstring angle	rad
yaw	yaw	rad
pitch	pitch	rad
bank	bank	rad
quaternionx	quaternion x	/
quaterniony	quaternion y	/
quaternionz	quaternion z	/
vx	speed vector x	m/s
vx	speed vector x	m/s
vx	speed vector x	m/s
rollrate	roll rate (local system x)	rad/s
pitchrate	pitch rate (local system y)	rad/s
yawrate	yaw rate (local system z)	rad/s
gforce	g force factor	/
height *	height of cg above ground	m
wheelheight *	height of wheel above ground	m
turbulencestrength *	turbulence strength	/
surfaceroughness *	surface roughness	/
hudmessages *	HUD message text	separated by ;
flaps **	flaps position index	0=most negative to MAXFLAPS-1
MC **	MacCready setting	m/s
water **	Water ballast content	kg

14 Using Condor with an external Flight Computer

XCSOAR

Connect Condor to XCSoar running both on different devices via internet/wifi connection

1. Install HW VSP3 – Virtual Serial Port.
   http://new.hwg.cz/files/download/sw/ver … _3-1-2.exe(http://new.hwg.cz/files/download/sw/version/hw-vsp3s_3-1-2.exe)
2. You can choose standalone installation (without Server/Client option)
3. Condor device (computer) and XCSoar device (Computer/Android phone/Kobo Mini) must be connected to same WiFi network /router
4. Note IP address of XCSoar device e.g. 192.160.0.12
5. In XCSoar FLY mode go to Config / Devices / Edit Device e.g. Device A Port: select TCP Port
   TCP Port: 4353 (note this number if different because you have to enter it into TCP Client in HW VSP3)
   Driver: Condor Soaring Simulator

   Note: You must select the “Condor Soaring Simulator” in the device list (Config/Devices/Edit/Driver) in order to have correct altitude readings.
6. Start Condor, go to Setup > Options > NMEA Output and check number of the last existing COM port (e.g. COM4). Exit Condor.
7. Start HW VSP3, go to Virtual Serial Port tab and set:
   Port name: COM5 (Choose COM number higher than the last existing one in step 5)
   IP Address: IP address of Computer / Android / Kobo Mini on WiFi network (e.g. 192.168.0.12)
   Port: 4353 (port from XCSoar device A configuration)
8. Click “Create COM”, leave HW VSP3 window in the background.
9. Start Condor, in Setup > Options enable NMEA output and choose virtual com port (e.g. COM5 created in step 6)
10. Start flight!
11. Next time you want to fly, you only need to start HW VSP3, go to Virtual Serial Port tab and click “Create COM” before starting Condor.

Additional maps for XCSOAR can be found at: https://www.xcsoar.org/download/maps/

A flight plan converter for XCSoar, LK8000 and SeeYou as well as speed polars for Condor gliders can be found at

https://www.condorutill.fr/