J'Adore PicaSim!

A superb — and free — flight simulator for slope soaring.

[Chip Kaye](#)

François Cahour's Quartz model in flight in PicaSim.

Flight simulators are, of course, no substitute for the natural-world pleasures of RC soaring. But they **can** be loads of fun to fly and can serve as an excellent, risk-free training tool. With PicaSim you will be able to put in stick time easily wherever/whenever to refine your existing piloting skills or develop new skills and the related muscle memory needed for true piloting fluency without thinking. As one personal example with many, **many** crash-free hours of practice I was finally able to crack the code on the previously disorienting inverted rudder control!

PicaSim introduced me to RC soaring in general and the marvels of slope in particular. Living in New England where much of the otherwise wonderful slope terrain is rendered unflyable by heavy tree cover, PicaSim has been my constant partner and most reliable flying locale (NOTE: Terence C. Gannon's delightful column *In The Air: Is great flying right on your doorstep?* from last month is an inspiration so I am ***not*** giving up!) I first learned of PicaSim through the wonderful video tutorial (Video 1) immediately below from Steve 'Surfimp' Lange flying his influential Le Fish design — seeing this I was instantly and completely hooked with slope soaring, aerobatics and PicaSim:

Video 1: Intro to R/C Slope Aerobatics with PicaSim.

First released in 2013, PicaSim began life earlier as the popular *Slope Soaring Simulator* (SSS), both developed by the generous and productive Danny 'Mr. Rowl' Chapman. Over time PicaSim has seen steady improvement with new features, planes and flying locales and is available on desktop for Windows (and MacOS by using Windows emulation software like *PlayOnMac*) or as a mobile app for both iOS and Android. I fly the desktop version which is entirely free to download and use but can be supported with a small donation on the *RowlHouse* website which I'd encourage for all who use it regularly. The two mobile apps are available through their respective app stores either as a free/limited version or for a nominal cost for the full/unlimited version (see *Resources*, below, for links to all of these sites).

For slope enthusiasts in general and particularly if you enjoy aerobatics, ultrabatics and VTPR, PicaSim truly stands apart from the competition. While major commercial simulators focus broadly on features and support for powered flight, they are generally limited for wind-powered flight. PicaSim though has gliders and slope soaring in its DNA. Many folks, myself included, feel that PicaSim's features, flight performance and glider and wind modeling for slope are second to none.

While a comprehensive tutorial on PicaSim's extensive features and configuration options is beyond the scope of this article (see related links below under *Resources*), here we will have a brief overview of the features that make PicaSim so special: *Gliders*, *Flying Sites* and *Customisation*. That said, while these technical details and features indeed make for a robust, customizable system, the true joy is in resulting excellence of PicaSim's slope soaring experience.

Setup and Configuration

Assuming you have downloaded and installed PicaSim and configured your radio transmitter as the controller (see related links below under *Resources*), at program startup you will be presented with the main screen. Here you will find access to PicaSim's useful Help system notes (`?` icon at bottom) and choice of PicaSim's two modes of operation: `Free-Fly` and `Challenge`.

Figure 2: Main startup screen.
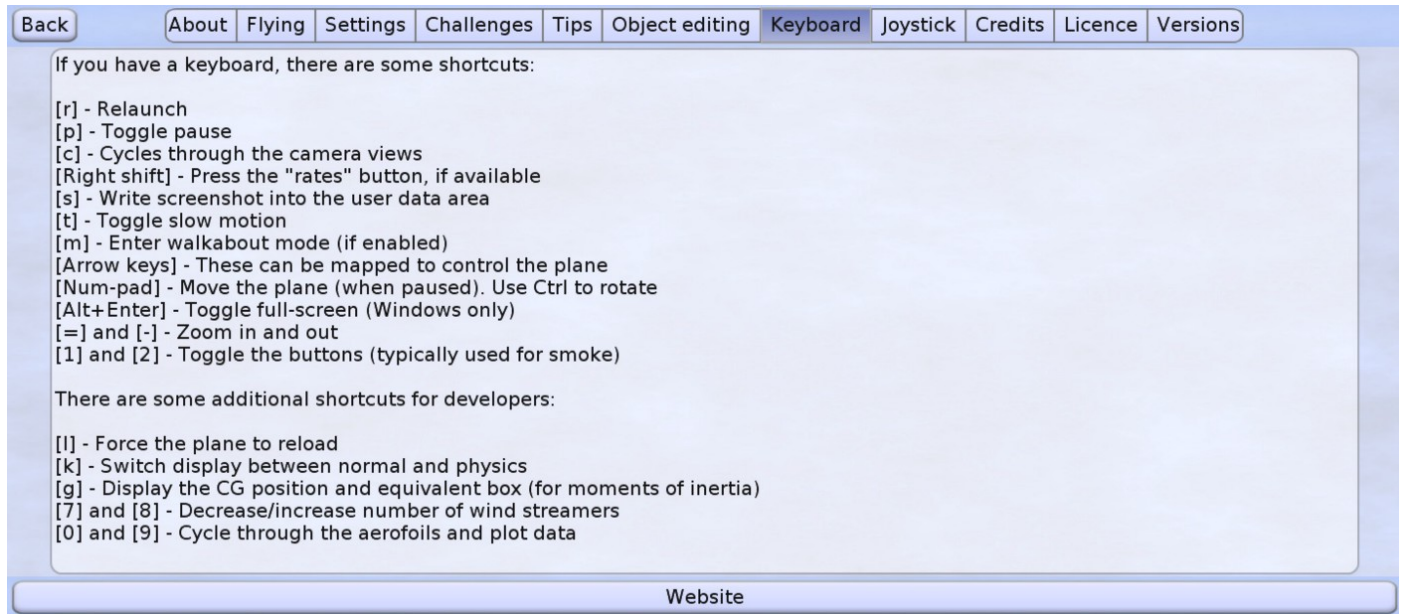
Figure 3: Help system displaying useful Keyboard short cuts

The `Challenge` mode offers a variety of training and contest flying scenarios (thermal duration, F3F racing, gated courses, mountain racing, etc.) which can be great fun. Here though we will be focusing on the `Free-Fly` mode whereby you can choose your own combinations of glider, flying site and other configurations.

PicaSim's configuration sysem is where you can set all manner of options for your glider and flying scenario and is accessed using the `Gear` icon displayed on both the startup screen (Figure 2) or the main flying screen (Figure 4).

Figure 4: Main flying screen with access to PicaSim configuration and walkabout features.

The configuration page includes a set of tabs across the top giving you access to a variety of program feature groups including `Aeroplane` and `Scenery` for tuning your glider and flying site which we will discuss in more detail later. Generally it will be these two tabs along with `Options 1` and `Options 2` you will use to set your own preferences. Each of the tabs can be viewed as an abbreviated 'Simple' set of options to get started or as an expanded set of all possible options by using the `Advanced` button at the bottom of the screen.

PicaSim also smartly provides the ability to save and load your own custom configurations through the `Save…` and `Load…` buttons at the bottom of the configuration page (see *Customization*, below, for details).
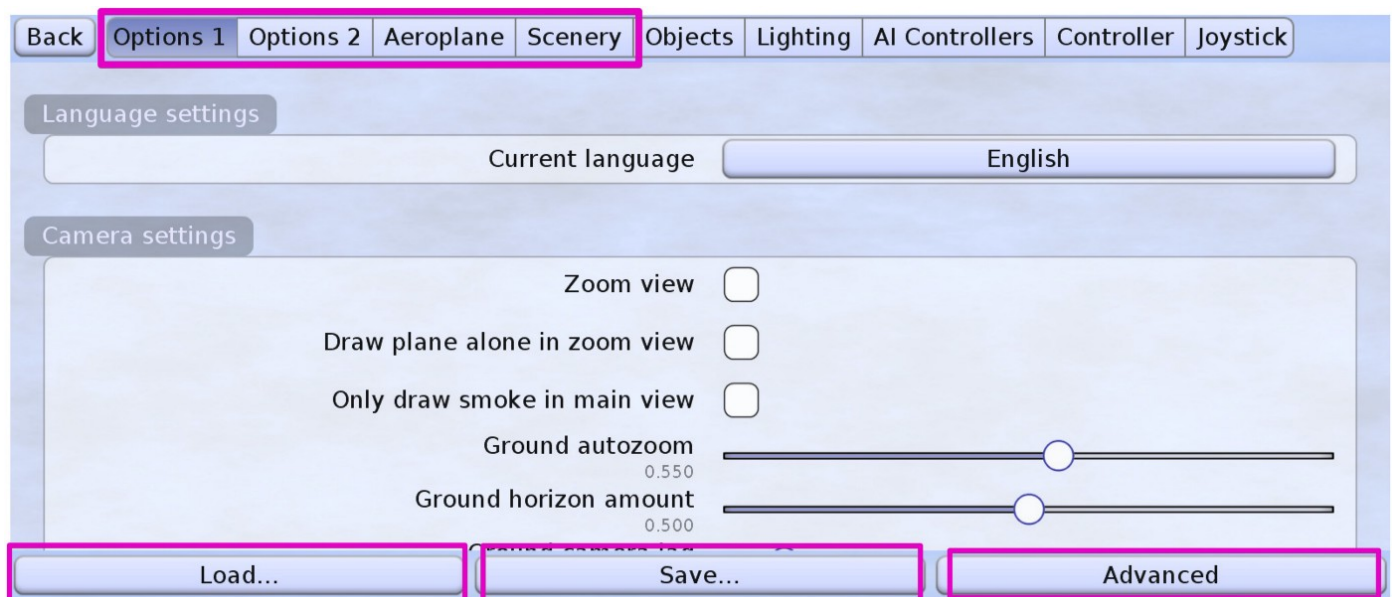

Figure 5: Configuration page.

Gliders (aka `Aeroplane`)

Out of the box PicaSim includes a large variety of glider types and models — slope, F3F, DLG, motor and scale gliders, for example — and among them are a number of well-known slope designs including *Le Fish* (Steve Lange),

Dreamflight Weasel (Michael Richter), *Quartz* (François Cahour), *Quark* (Island Models), *Phase 6* (Chris Foss) and others. In general these and all of PicaSim's models have been painstakenly tuned to best approximate their real world counterparts, but as we'll see they can be further tuned and customized to match your own preferences.
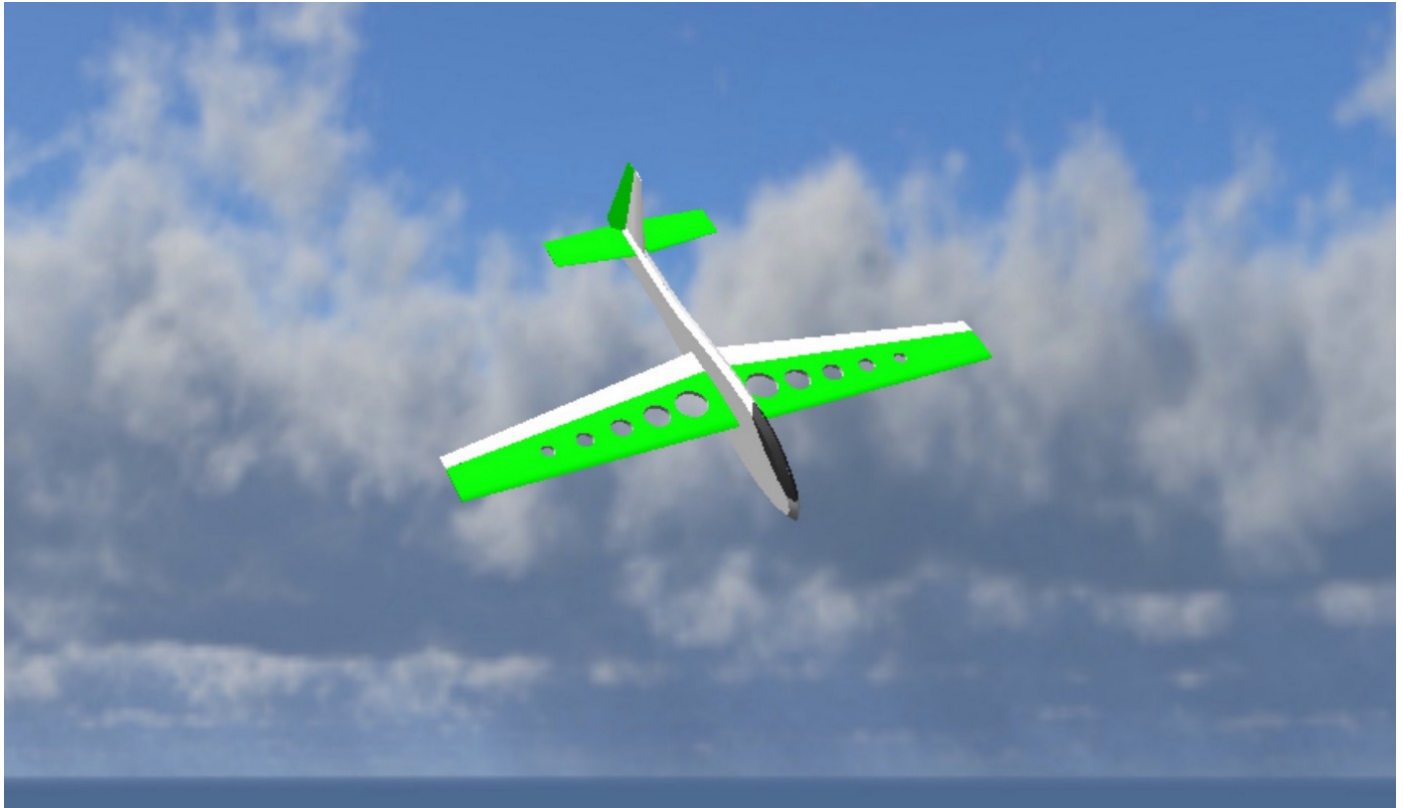
Figure 5A: Le Fish Ultralight (design: Steve Lange)

Figure 5B: Dream-Flight Ahi (design: Michael Richter)

Figure 5C: Quark (design: Island Models)

Figure 5D: Trapeze (design: Paige Anderson)

Beyond PicaSim's included models, new models can also be created and added to the system. The process for creating new models (see *RowlHouse Customisation* page in *Resources*, below) is quite involved, but anyone can take advantage of models created by others. Recently RCGroups member *Bishop_1* created an excellent version of the *Dream-Flight Ahi* which can be easily downloaded (see also *PicaSim Ahi* in Resources) and added to PicaSim for anyone interested as shown in the following video.

Dreamflight Ahi for PicaSim

Figure 6: Tutorial on installation of the Dreamflight Ahi.

The default configuration for each glider is modified through the config page `Aeroplane` group tab. The group's many options are broken up into several sections and below we see the first `General settings` section which provides quick access to the primary flight and airframe tuning features. Here you have the ability to add and adjust ballast and modify the size, mass and drag of the airframe giving you a great deal of control to customize the flight characteristics to your own preferences or even to create what effectively is a different model—for example, ever flown a 3m *Le Fish*?
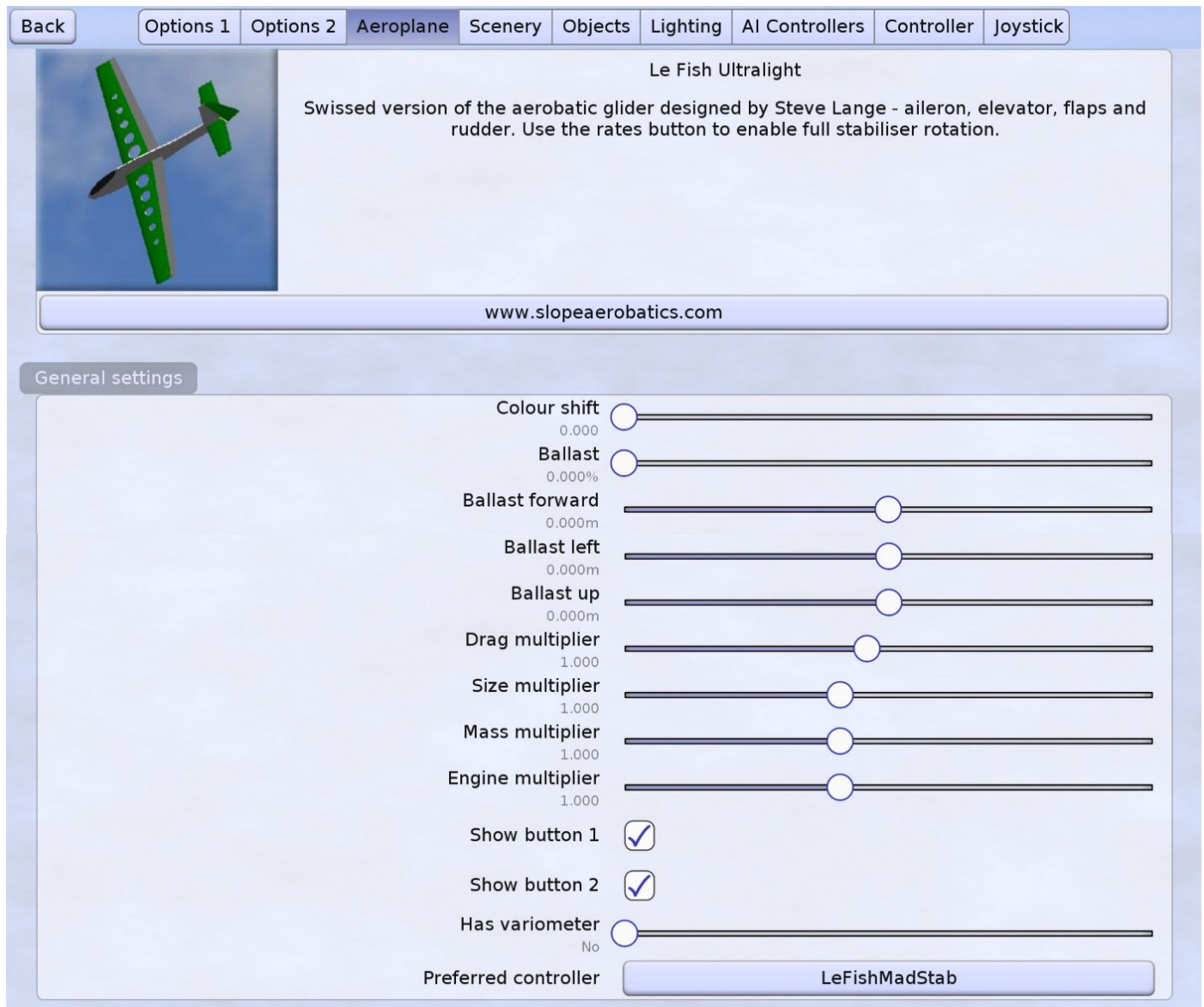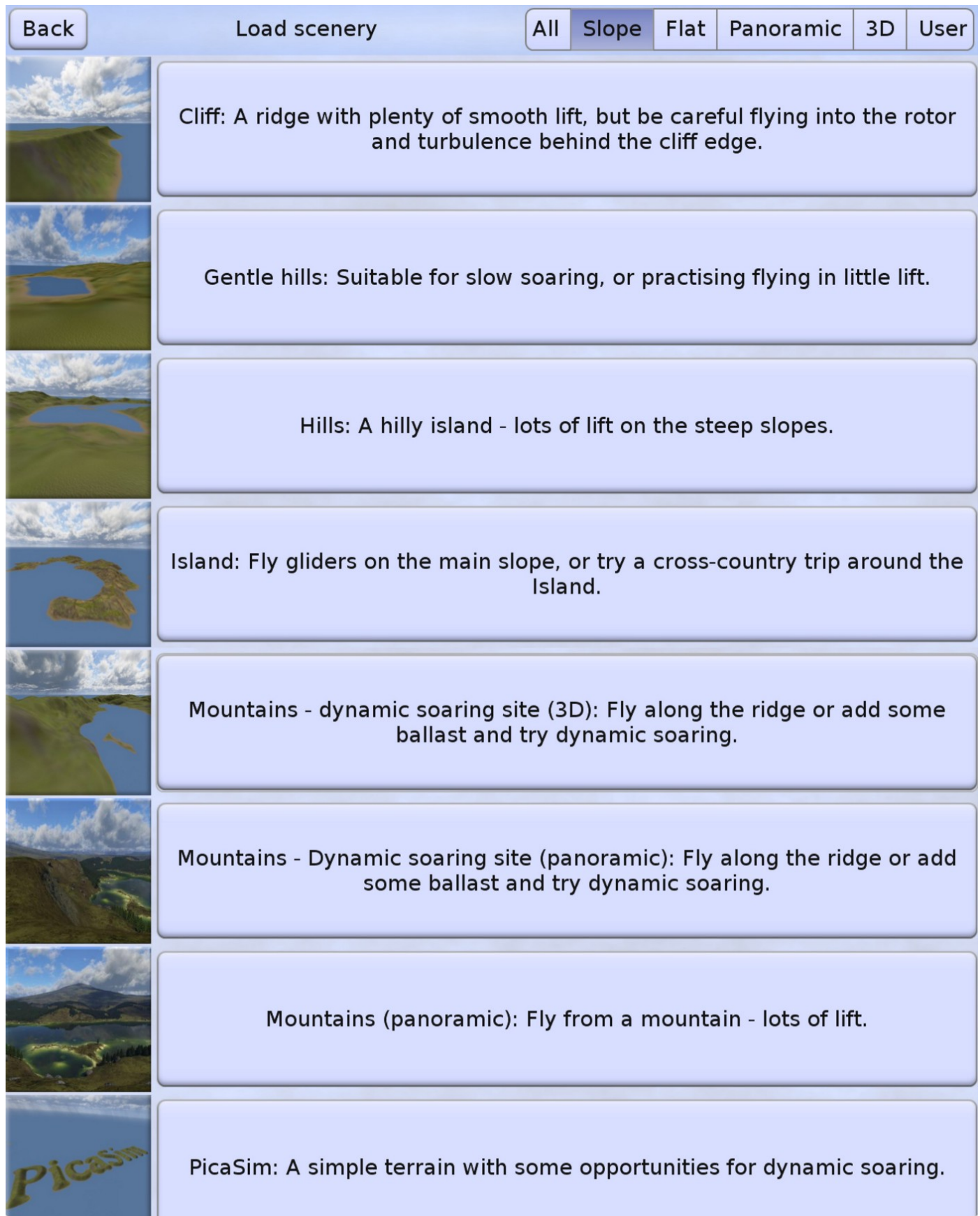
Figure 7: General glider configuration settings.

Flying Sites (aka `scenery`)

To my mind, PicaSim's many slope flying sites are perhaps it's greatest strength. Below you can see a number of the many sites which can be accessed throught the `Load…` button (Figure 5) on the configuration page `Scenery` tab. Using the tabs shown at the top right of the `Load scenery` screen you can view all of the flying sites or choose a subset including `Slope` as shown below or `User` which will display your customized flying sites

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2021-07-15, 17:09

created with the `save…` button (Figure 5).

The `cliff` site first on the list is a great place to start and seems to be especially popular as seen in many PicaSim YouTube videos where it is featured. But don't let that obscure the enormous variety of slope gliding experiences contained in the other options as described below (Figure 8).

Back | Load scenery | All | Slope | Flat | Panoramic | 3D | User

Cliff: A ridge with plenty of smooth lift, but be careful flying into the rotor and turbulence behind the cliff edge.

Gentle hills: Suitable for slow soaring, or practising flying in little lift.

Hills: A hilly island - lots of lift on the steep slopes.

Island: Fly gliders on the main slope, or try a cross-country trip around the Island.

Mountains - dynamic soaring site (3D): Fly along the ridge or add some ballast and try dynamic soaring.

Mountains - Dynamic soaring site (panoramic): Fly along the ridge or add some ballast and try dynamic soaring.

Mountains (panoramic): Fly from a mountain - lots of lift.

PicaSim: A simple terrain with some opportunities for dynamic soaring.

Figure 8: Selection of slope flying sites.

Of special interest for selecting flying sites is PicaSim's *Walkabout* feature. Clicking the walking-figure icon (Figure 4) puts you into a mode whereby you can use the right stick on your transmitter to move throughout the selected scene to find new slopes to fly. Once you find a new spot you can immediately begin flying as the program will automatically configure the wind direction to blow directly into the slope. And if you like the new slope position you can save it as part of your user configuration by using the `Save…` button (Figure 5).

As with the `Aeroplane` tab discussed earlier, the configuration page `Scenery` tab is broken up into several sections. Below we see the first `Wind settings` section which provides quick access to the primary parameters for controlling wind and lift. In particular the `Wind speed`, `Wind bearing` (for off-axis wind direction), `Turbulence amount` and `Rotor tendency` parameters allow you to dial in anything from near perfect conditions — great for practicing new aerobatic manoeuvres without fighting the wind — to near impossible conditions — great for honing your skills and saving your fleet from disasterous flying in sub-optimal conditions in the real world.

Figure 9: Flying site wind configuration settings.

Customization

Once you have dialed in settings for any of the configuration screen tabs, you can save it as a `User` configuration to be loaded at any time. Below we have customized the standard `cliff` flying site by dialing down the values `Wind speed` and `Turbulence amount` (the values shown happen to be standard settings I use for flying the *Le Fish Ultralight* model). Once you are

happy with your own settings you can click the `Save…` button at the bottom of the screen.
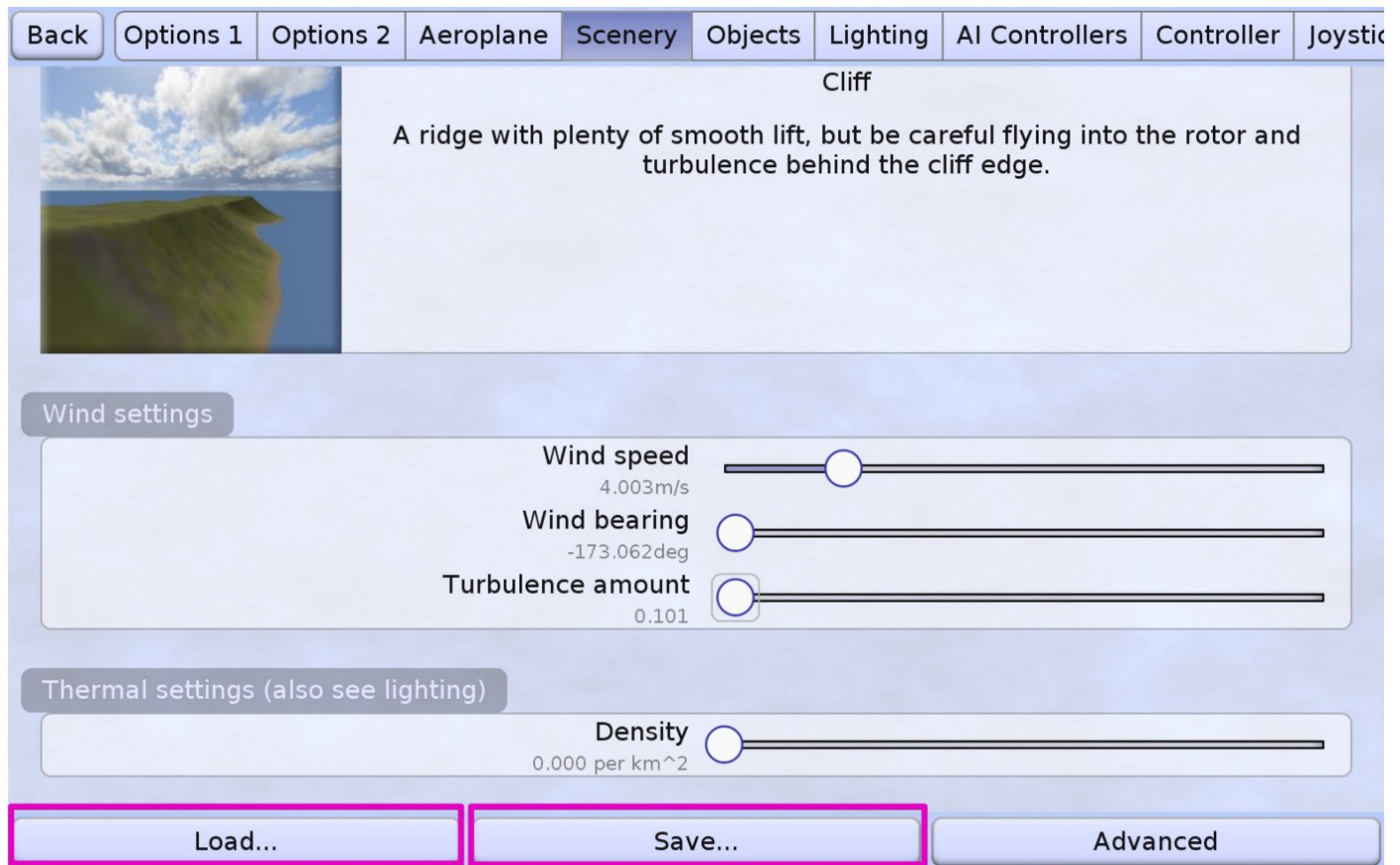
Figure 10: Customized "Cliff" configuration, ready to be saved.

Here we see the display after clicking `Save…` above. In this example I am naming my custom `cliff` configuration as `my_cliff`.
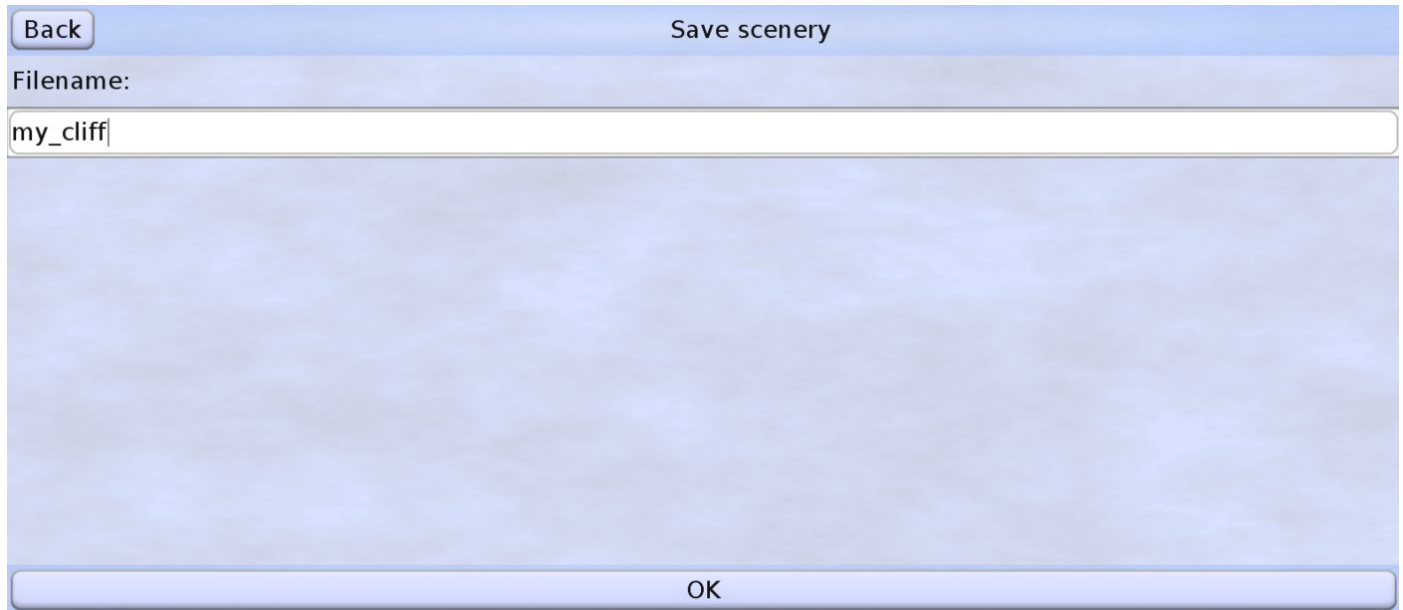
Figure 11: Saving 'my_cliff' configuration on the 'Save… button screen.

And here we see the display after clicking the Load… button above. By selecting the User tab at the top right we are presented with only our custom configurations for easy access, in this case the my_cliff configuration saved above.

Figure 12: Loading custom 'my_cliff' configuration on the 'Load…' button screen

Note again this Save… and Load… functionality applies to all of the

configuration page tab groups so you can save custom settings for all of PicaSim's configurable options.

Finally, going beyond the main wind settings in the example above, the following video demonstrates how you might use more advanced `Scenery` parameters to develop a highly customized flying site. In this example I am configuring the standard `cliff` site to approximate a flying site based on a remarkable video of Eric Poulain flying his iconic Excalibur design on a low 2m slope directly on a beach in France (see *VTPR de Plage* in *Resources*, below).

PicaSim config for "VTPR de plage"

Video 13: Customizing a flying site to match it's real-world counterpart.

End Note

With this very brief overview of PicaSim my sincere hope is that it might spur your curiosity enough to give it a try — you may well be surprised at just how useful and fun it can be to fly virtually! And I would invite anyone to post to my RCGroups thread *Documenting PicaSim for Slope and VTPR* (see *Resources* below) with your questions and — hopefully — your PicaSim experiences ahead. Cheers.
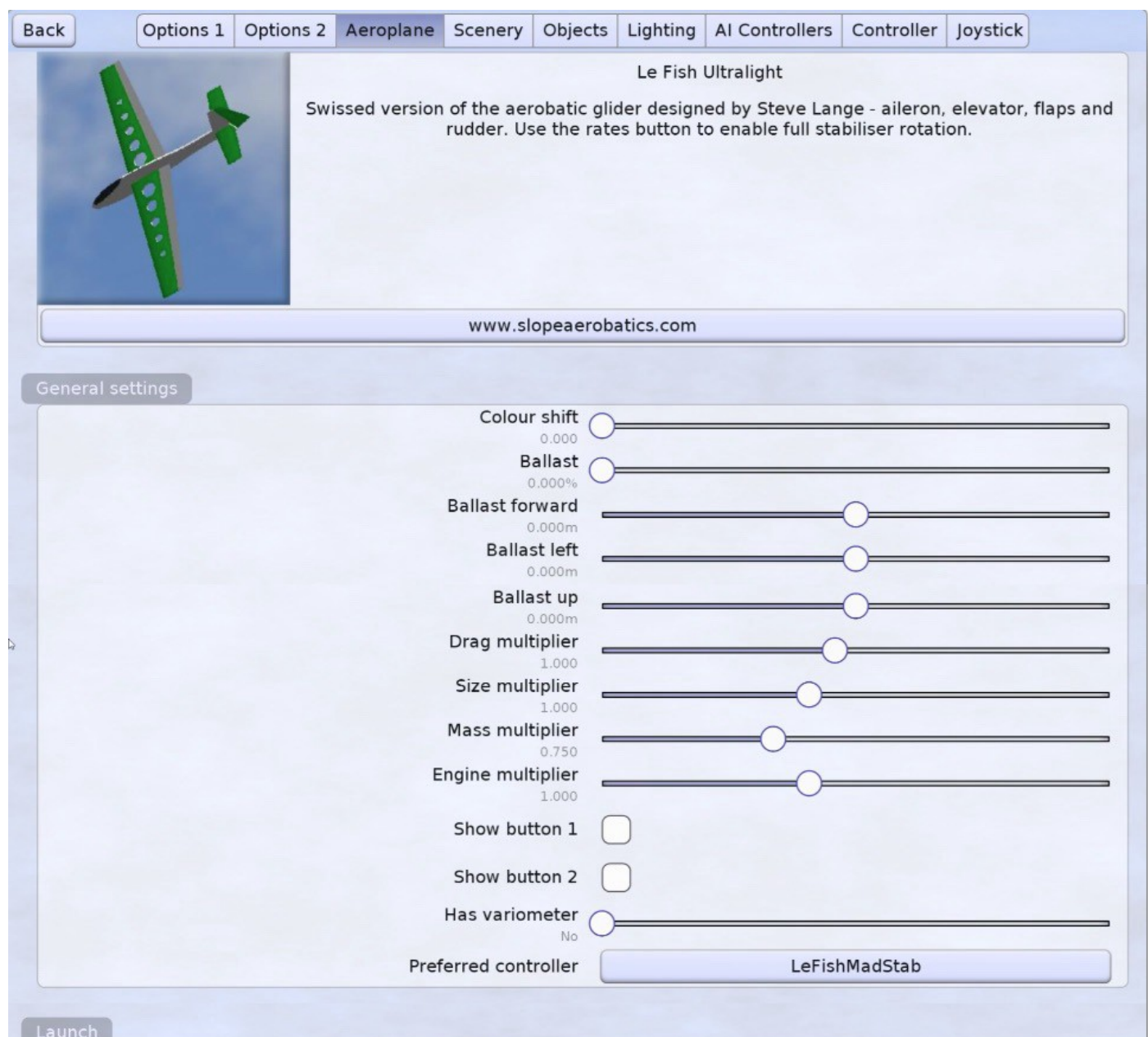
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Resources

Below are a few resource links to help get you going with PicaSim and later perhaps to dive deeper into it's more advanced features and configuration.

- [The Official PicaSim website](#)
- [Downloading PicaSim](#)
- [Free *PlayOnMac* software for running PicaSim on Mac](#)
- [Glowing words about PicaSim from François Cahour](#)
- [RCGroups thread — *Documenting PicaSim for Slope and VTPR*](#)
- [RCGroups post — *PicaSim Ahi model files and installation*](#)
- [RCGroups threads search for 'PicaSim'](#)
- [Danny Chapman's official PicaSim YouTube channel](#) (videos)
- [*PicaSim: Controller setup with R/C Transmitter*](#) (video)
- [*Intro to R/C Slope Aerobatics with PicaSim*](#) (video)
- [PicaSim for aerobatics practice — *Studying the Masters: BPLR's Mad Snap in PicaSim*](#) (video)
- [*François Cahour's Quartz in PicaSim*](#) (video)
- [*In The Air: Is great flying right on your doorstep?*](#) by Terence C. Gannon
- [*Slope Soaring Simulator*](#) (SSS)

- [RowlHouse Customisation page](#)
- [Dream-Flight Ahi](#) (promo video)
- [VTPR de Plage](#) (video)

Full Configuration Options

The full set of `Advanced` options for each of the configuration page tabs are quite extensive. Below you can view all of the options available for the important `Aeroplane` and `Scenery` tabs.

Launch method (flat sceneries)
Bungee

Launch speed
10.000m/s

Launch angle up
0.000deg

Launch up
1.300m

Launch forwards
1.500m

Launch left
-1.500m

Launch offset up
-0.100m

Relaunch when stationary

Tow hooks

Belly hook offset forwards
0.000m

Belly hook offset up
-0.030m

Nose tow hook offset forwards
0.300m

Nose tow hook offset up
-0.030m

Bungee launch

Max bungee length
100.000m

Max bungee acceleration
25.000m/s^2

Aerotow launch

Tug plane
Jackdaw

Tug size scale
1.000

Tug mass scale
1.000

Tug engine scale
1.300

Tug max climb slope
0.150

Tug target speed
13.000m/s

Aerotow rope length
10.000m

Aerotow rope strength
5.000

Aerotow rope mass scale
1.000

Aerotow rope drag scale
1.000

Aerotow max height
150.000m

Aerotow circuit size
100.000m

Crash detection

Delta velocity fwd/back
5.000m/s

Delta velocity sideways
5.000m/s

Delta velocity up/down

10.000m/s

Delta roll velocity
750.000deg/s

Delta pitch velocity
750.000deg/s

Delta yaw velocity
500.000deg/s

Suspension resilience scale
1.000

Chase camera

Target offset fwd
0.000m

Target offset up
0.000m

Distance
2.000m

Height
0.400m

Vertical vel frac
0.500

Flexibility
0.900

Cockpit camera

Pitch
0.000

AI Controller

Plane type
Glider

Allow AI control ☑

Can tow ☐

Waypoint tolerance
10.000m

Min speed
10.000m/s

Cruise speed
15.000m/s

Max bank angle
70.000deg

Bank angle per heading
0.500

Speed per altitude
1.000s^-1

Glide slope per excess speed
0.050s/m

Pitch per roll angle
0.010deg^-1

Heading change for no slope
90.000deg

Max pitch control
0.200

Max roll control
1.000

Control per roll angle
0.010deg^-1

Pitch control per glide slope
1.000

Roll time scale
0.100s

Pitch time scale
0.050s

AI Navigation

Min altitude	15.000m
Slope Min upwind distance	10.000m
Slope Max upwind distance	20.000m
Slope Min left distance	-50.000m
Slope Max left distance	50.000m
Slope Min up distance	-10.000m
Slope Max up distance	10.000m
Slope Max waypoint time	60.000s
Flat Max waypoint time	100.000s
Flat Max waypoint time	60.000s

Smoke source 0

Enable	☑
Colour hue	0.000
Colour saturation	0.000
Colour brightness	1.000
Position fwd	0.200m
Position left	0.000m
Position up	-0.050m
Velocity fwd	-1.000m/s
Velocity left	0.000m/s
Velocity up	0.000m/s
Max num particles	10000
Channel for opacity	Smoke 1
Min opacity	0.000
Max opacity	0.400
Channel for rate	Hook
Min rate	60.000Hz
Max rate	60.000Hz
Initial size	0.100m
Final size	5.000m
Life span	4.000sec
Damping time	0.100sec

Jitter
0.100m/s

Engine wash amount
0.700

Hue cycle frequency
0.000Hz

Smoke source 1

Enable ✓

Smoke source 2

Enable ✓

Info

Mass 2.124

Inertia 0.430, 0.350, 0.775

Wing area 0.75

Extents 1.495, 2.500, 0.370

Current position -59.761, 186.579, 48.838

| Load... | Save... | Delete... | Simple |
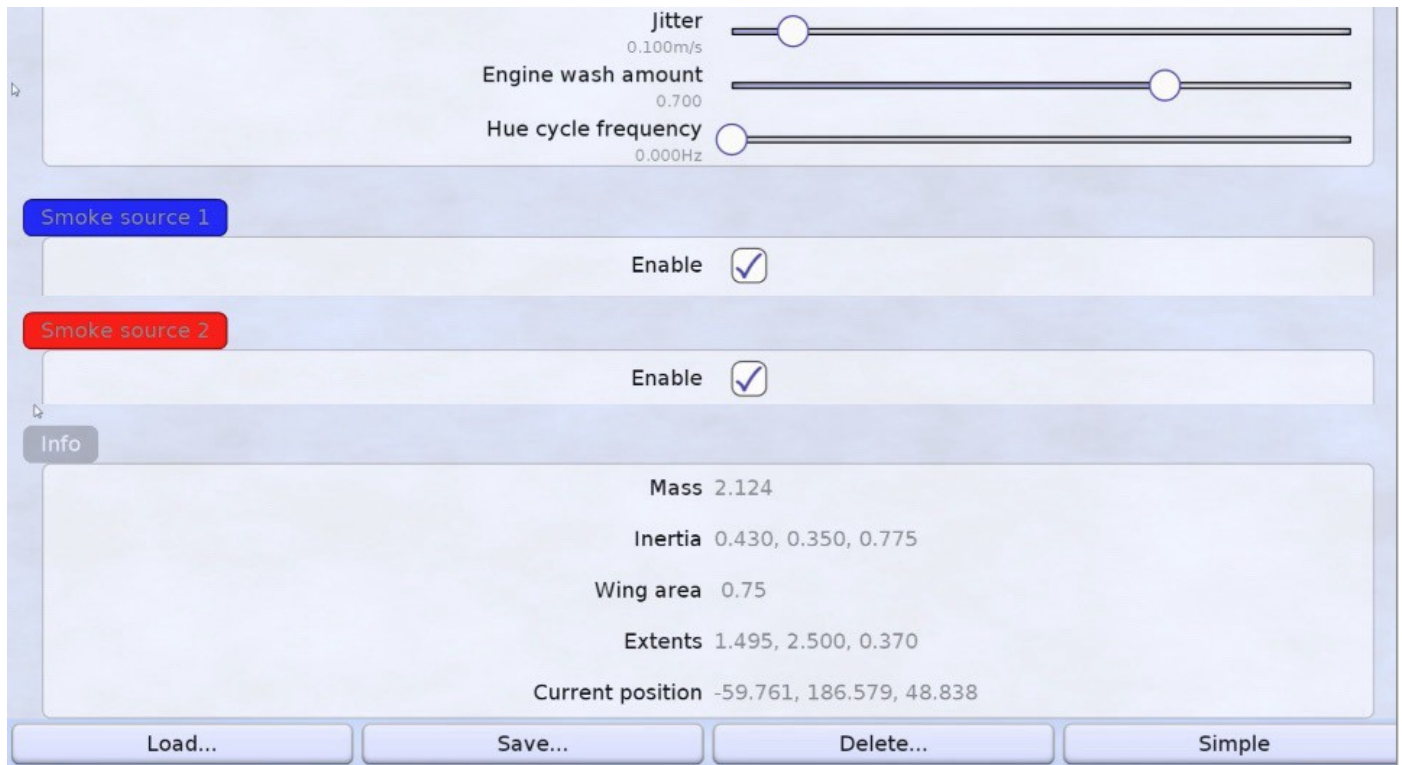
Figure 11: Full 'Aeroplane' glider configuration options.

Back | Options 1 | Options 2 | Aeroplane | Scenery | Objects | Lighting | AI Controllers | Controller | Joystick

Cliff

A ridge with plenty of smooth lift, but be careful flying into the rotor and turbulence behind the cliff edge.

Wind settings

Wind speed
5.000m/s

Wind bearing
-173.062deg

Allow bungee or aerotow launch ☐

Wind gust timescale
60.000s

Wind gust fraction
0.250

Wind gust angle
20.000deg

Turbulence amount
0.600

Surface turbulence
1.000

Wind shear turbulence
1.000

Dead air turbulence
1.000

Wind lift smoothing
3.500

Vertical wind decay height
100.000

Separation tendency
1.000

Rotor tendency
1.000

Boundary layer depth
50.000

Thermal settings (also see lighting)

Density
0.000 per km^2

Range
1000.000

Life span
300.000s

Depth
50.000m

Core radius
40.000m

Downdraft extent
80.000m

Updraft speed
3.000m/s

Ascent rate
0.400m/s

Expansion over lifespan
2.000

Runway

Runway type
None

Length/radius
100.000m

Position X
0.000m

Position Y
0.000m

Height
0.000m

Angle
0.000deg

Width
10.000m

Surface settings

Roughness
0.010m

Friction
1.000

Ridge terrain settings

Height
100.000m

Max height fraction
0.600

Width
100.000m

Height offset
20.000m

Horizontal variation

Figure 12: Full 'Scenery' flying site configuration options.

*All images and videos by the author. Read the [next article](#) in this issue, return to the [previous article](#) in this issue or go to the [table of contents](#). A PDF version of this article, or the entire issue, is available **upon request**.*