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Author: Scott Manley - CFIG

In this month's Condor Corner, I hope to enhance your glider flight simulation experience by introducing you to a few more features of the Condor software and letting you in on a few tips, tricks, and secrets. While Condor is a very good glider flight simulation, especially for the money, it is not real flight. As a computer-based application, it has its shortcomings. There are some aspects of real life glider flight it does not simulate very well. It was designed and optimized as a simulation of networked sailplane competition flying, not as a flight-training tool.

For all of these reasons, those of us who choose to use the software as a training and proficiency tool need to adapt. We need to come to terms with the fact we are using a $60 piece of computer software, not a $6 million full-motion simulator. We need to master some new simulator-specific skills, become familiar with the software's features, and learn to compensate for its limitations. We need to get creative.

The payoff, however, goes far beyond simply compensating for Condor's limitations. The software has an amazing array of capabilities not available in real life. To take advantage of all this really good stuff, we again need to spend some time getting to know the software and learning to use its features to maximum advantage.

The purpose of this installment of Condor Corner is to help flatten your learning curve. I will introduce you to the simulator-based skills you need to master. I will share with you some of the "tips and tricks" I use to circumnavigate the software's shortcomings. I will let you in on a few "secrets", and describe how I use features of the software in ways the Condor developers probably never intended. There is a lot of ground to cover in this regard and I suspect it may require this and one or more future issues of Condor Corner to get the job done.

Let's get started with simulator-specific skills.

Note: Items in *italics* are Condor-specific.

Looking Around.
This may be the most important skill you need to master with respect to computer-based flight simulations. Most of us run Condor on our home computer systems or laptops, using a single monitor designed for things like word processing, web browsing, and email. The result is a very limited field of view. I estimate Condor's default field of view (from the cockpit) to be about 40-45 degrees either side of the vertical plane and about 30 degrees above and below the horizon. By comparison, your normal (real life) human visual field, in each eye, extends from approximately 60 degrees nasally (toward the nose, or inward), to around 100 degrees temporally (away from the nose, or outward), and approximately 60 degrees above and 75 degrees below the horizontal meridian.

To compensate for this rather dramatic loss in field of view, you need to learn to "look around" in Condor. Essentially you need to be able to easily and quickly move your available field of view to where you need it. For example, when flying the downwind leg of the traffic pattern in Condor, using the default (straight ahead) view, you cannot see the runway down and to the side. To establish your relationship to the landing area, you need to adjust (redirect) your available field of view down and to the side until the runway is visible. Doing so, however, results in losing the view of your instrument panel and the horizon ahead. Therefore, once you know where you are in relation to the runway, you need a way to quickly and easily reestablish the default view.
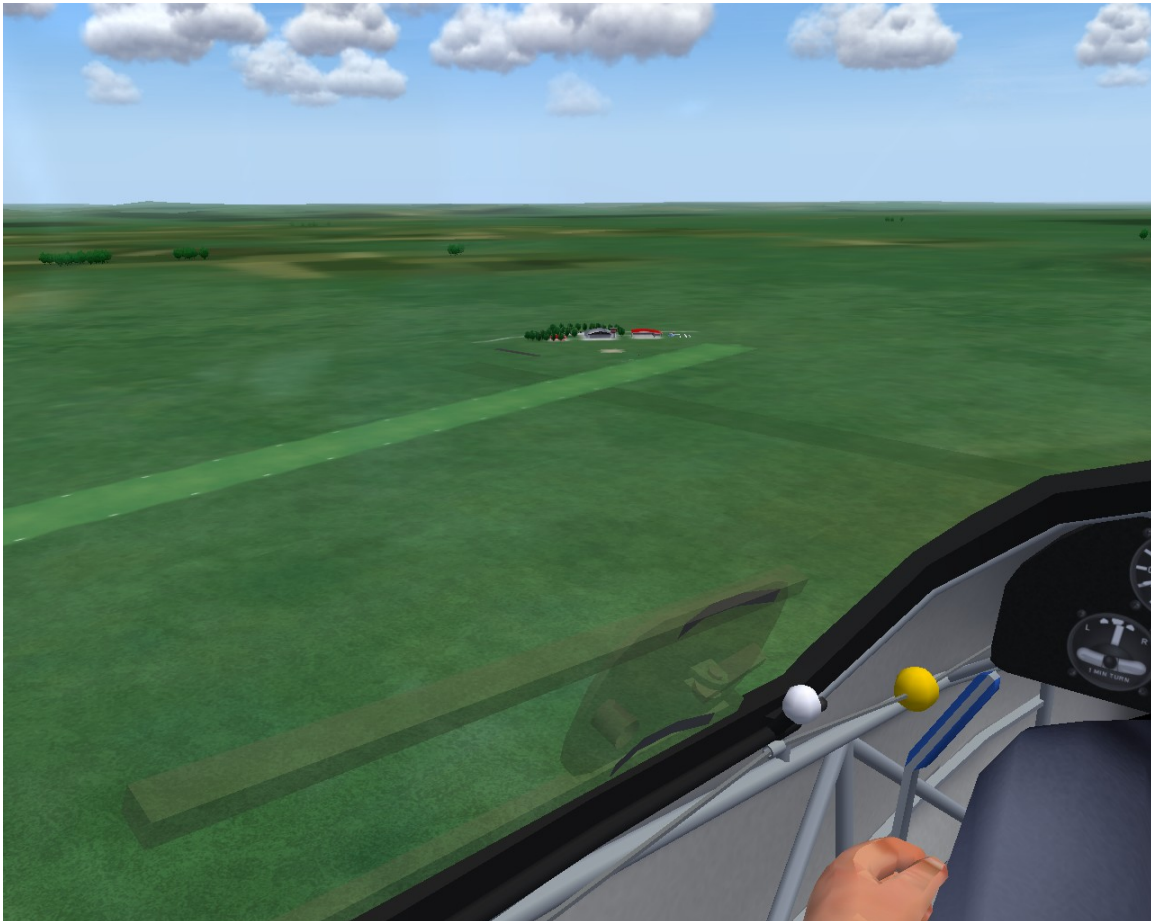
Adjusting your Field of View on Downwind

The first time you run Condor on your PC, the software will sense the presence of your joystick and automatically assign the POV (point of view) (look around) function to the hat switch. The hat switch lets you change your point of view in increments of about 45 degrees left and right and in some lesser number of degrees up and down. Personally I don't like using the hat switch. While convenient, I find it unnaturally jerky and thus not a very good simulation of my natural ability to change my point of view. I also have difficulty using the hat switch to reestablish the default (forward-looking) view after looking elsewhere.

A much better method for looking around, in my opinion, is Condor's "*Mouse Look*" feature. Within the *Setup/Inputs/Options* section, you can opt to use your computer's mouse to redirect your available field of view. Because mouse tracking is an analog process, you are able to redirect your field of view exactly where you need it at a much more natural rate. With some practice, it becomes second nature to use the mouse to look around. Implementing *mouse-look* does not preclude (override) your ability to look around using the hat switch.

While it is quite easy to look away using either the hat switch or the mouse, I find it considerably more difficult to return to the default view using either control. Having probably come to the same realization, the Condor developers implemented a special "*View Reset*" function that reestablishes the default view with the touch of a button. The default keyboard assignment for *View Reset* is the "5" on the numeric keypad. I find the *View Reset* function so essential, I reprogrammed it onto my joystick.

Secret:
One of my students, Dan Harder, recently discovered the *View Reset* function can be invoked by simultaneously clicking the left and right mouse buttons. I'm pretty sure that is an undocumented feature of the software.

So, in the same way you naturally learn to control the glider's movements by using stick and rudder inputs, you need to learn to naturally redirect your available field of view in Condor.

A Related Digression.
For you gadget guys out there, there is a product called TrackIR that uses a fixed receiver to detect signals from an infrared transmitter attached to your head. Small movements of your head cause the point of view on your monitor to change correspondingly if not proportionately. I have not tried TrackIR, but folks who have seem to like it.

I have been hesitant to recommend TrackIR for the same reasons I do not recommend multiple monitors, large screen computer projection, motorized flight simulation chairs, surround sound, and the use of salvaged glider fuselages. While I value, and am intrigued by, any device that enhances the realism of the flight simulation experience, I consider the cost and complexity of these types of amenities to be serious obstacles to the widespread adoption of glider flight simulation.

Views
In previous Condor Corner articles (probably all of them so far), I have mentioned and/or listed the available views in Condor. Unlike the real world, where you are afforded a single view of your environment (inside the cockpit looking out), Condor provides you with an entire array of interesting ways to visualize your simulation world. From an instructional standpoint, these additional views are invaluable and are well worth repeating here, along with their default keyboard assignments.

- F1 – Cockpit view
    - (the only view available to you in real life and Condor's default)
- F2 – External view from any point around the glider
- F3 – Fixed Camera Positions (toggle)
    - o 3.1 – Behind the glider
    - o 3.2 – In front of the glider
    - o 3.3 – On the right wing tip looking back at the fuselage
    - o 3.4 – On the vertical stabilizer looking forward
- F4 – On the Airport looking up at the glider
- F5 – External view from any point around the tow plane
- F6 – The glider flying by a fixed point in space

It is well worth your while to become familiar, and comfortable, with using Condor's available views. And don't forget the Pause ("P") function; priceless!
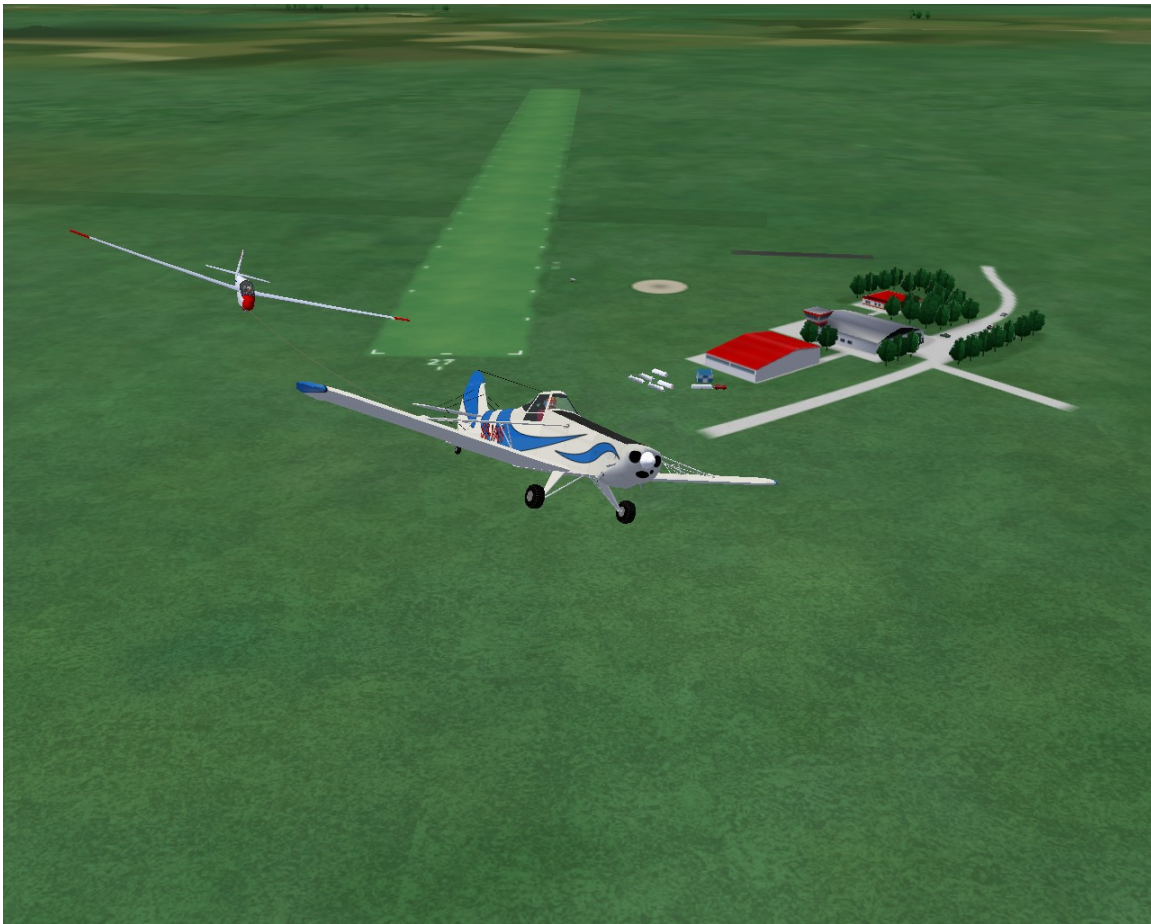
F5 – External View relative to the Tow Plane

Zoom
Within each of Condor's views, you have a "zoom" capability; essentially mimicking your natural ability to bring into focus objects at varying distances. This function is normally controlled using the "+" (zoom in) and "-" (zoom out) keys associated with the

numeric keypad on a full-size keyboard. If you are running Condor on a laptop, which I often do, you will be disappointed to discover the "+" and "-" keys on the right side of the row of numbers (at least on my Mac) do not perform the zoom function. To have available the zoom function, along with a bunch of other Condor functions that default to keys not present on my laptop, I had to incorporate a separate, full-size, USB keyboard into my equipment mix.

My Condor Corner co-conspirator, Frank Paynter (TA), finds the zoom function important enough to program it to directly onto his joystick.

Panel Zoom
The Condor developers must have had us old, visually challenged guys in mind when they implemented the *Panel Zoom* function. *Panel Zoom* is invoked by pressing the "Y" key on the keyboard. As you might expect, *Panel Zoom* is only available in the *Cockpit* (F1) view. Pressing and holding the "Y" key zooms in on and enlarges the instrument panel so you can better read the gauges and see the PDA screens. Releasing the "Y" key quickly and easily returns the Cockpit view to the default.

"Controlling" the Tow Plane
Folks often ask me whether there is a way to control the tow plane in Condor. The answer is yes; and no. For the most part, you cannot directly control what the tug does, but once you understand what it has been programmed to do, you have a fair amount of control over how things play out. Here is my understanding of what the Condor tug is doing and why.

Condor was designed to simulate competition soaring. Real world competitions are hosted at gliding sites, so every Condor session begins at an airport. In the real world, each day's competition is based on a "task" comprising a start, a series of turn-points, and a finish, so each Condor session requires that a *Task* be specified. The role of the tow plane, at these events, is to transport each competitor into the sky, in the vicinity of the start gate, and ideally, into a source of lift. In any case, the competitor is expected to release at some specified maximum altitude *(Aerotow Height)*.

To simulate it role at a contest event, Condor's tow plane:
1. Takes off from the selected airport.
    > The tug uses the runway most closely aligned with the wind direction specified in the *Weather* tab of the session's *Flight Plan* file.
2. Climbs straight ahead to an altitude of 300 ft AGL.
3. Proceeds directly to the *Task Start.*
    > The tug will turn from the runway heading as required.
4. Searches for lift.
    > If the tug reaches the *Start* gate before reaching its assigned release altitude, it turns as required and proceeds directly to the nearest thermal. If the glider pilot does not release into the first thermal, the tug again turns as required and proceeds to the next nearest thermal. This process continues until the glider pilot releases or the tow arrives at the specified release altitude.

5. Doesn't care about cloud base.
    If the assigned release altitude is above cloud base, the Condor tug "will" tow you into the clouds.
6. Signals you to Release.
    At the assigned release altitude, the tugs levels out for a few seconds and waits for you to release. If you comply in relatively short order, the tug issues the "immediate release" signal; it rocks you off.
7. Releases you.
    If you persist in hanging on after so clearly being directed to do otherwise, the tug sets you free. It then proceeds to mock you by displaying a text message on the screen that reads:
    "*(Your name here) does not care if the tow plane rocks its wings.*"

    The tug will also release you if you get too far out of position; adding insult to injury by displaying:
    "*(Your name here) has trouble following the tow plane.*"
8. Makes a beeline back to the airport.
    Upon release, the tug will turn to whatever heading provides it with the most expedient return to the airport. Unlike the real world, however, that turn is "not" always to the left.

The Condor tugs all fly at airspeeds between 60 and 70 knots depending on whether the glider being towed is carrying water ballast. The tug's airspeed seems to be based on how full the glider's ballast tanks are, since a fully loaded standard class ASW-28 weighing in at 1157 lbs is towed at the same 70 knots as an ASW-22BL at its 1653 lb maximum gross. I don't know how the tug pilot knows, but if the glider pilot begins dumping ballast while on tow, the tug will correspondingly reduce its airspeed, gradually and precisely returning to 60 knots just as the tanks go dry. You can actually use your airspeed indicator as a water meter. If the tug happens to be flying faster than 60 knots so as to accommodate a ballasted ship, it will reduce its airspeed back to 60 knots after the glider releases.

If the assigned *Aerotow Height* is above 300 AGL, upon release, the tug will return to the airport by the most direct route, fly the most expedient traffic pattern possible, land on the far right side of the active runway so as to clear the grid of gliders staged on the left side, exit the active runway, taxi back to the launch area, and shutdown. Oddly enough, if the assigned *Aerotow Height* is anything less than 300 AGL (164 ft AGL is the absolute minimum), the tug, upon release, continues to fly straight out, on the runway heading, at the assigned release altitude, indefinitely; presumably until it runs out of fuel. 'A programming oversight, me thinks.

Tricking the Tug into Turning Left after Release

OK. Now that you know more than you ever thought possible about the behavior of Condor's tugs, you can begin to "control" that behavior using some clever combinations of the following two settings:

1. The tow release altitude *(Aerotow Height)*
2. The placement of the *Task Start* gate relative to the airport

To specify the tow release altitude:

1. Click the *"Free Flight"* button located on the Condor main menu.
2. Select the *"NOTAM"* tab on the *Flight Planner* page.
3. Select *"Aerotow"* from the *Start-type* drop-down menu.
4. Specify the release altitude (AGL) using the *"Aerotow Height"* slide bar.

To establish the *Start* gate placement relative to the selected airport:

1. Click the *"Free Flight"* button located on the Condor main menu.
2. Select the *"TASK"* tab on the *Flight Planner* page.
3. Click/Drag the scenery background until it contains the desired airport.
4. Click the *"New"* button to create a new task.
   You may be prompted to click *"OK"* to clear any existing task.
5. Place the cursor on the airport icon and single click/release the left mouse button.

6. Move the mouse to position the *Start* gate and then single click/release the right mouse button.
7. Select *"Finish Task"* from the drop down menu.
8. To reposition an existing *Start* gate, move the cursor over the *Start* gate until the cursor displays as crossed double arrows. Left click and drag the *Start* gate to a new location. Release the left mouse button.

Here are some examples of how to use the "release altitude" and "start gate placement" features, in combination, to "control" the Condor tow plane's behavior.

1) If you want the tug to take off and tow straight out without turning:
   Place the *Start* gate directly off the departure end of the runway, at a distance that ensures the tug arrives at its release altitude before it reaches the *Start* gate.

   Placing the *Start* gate slightly to the left of the runway extended centerline ensures the tug will turn left on release, since a left turn provides the most expedient return to the airport.

2) If you want the tug to make a left/right turn after reaching 300 ft AGL:
   Place the *Start* gate anywhere to the left/right of the extended runway centerline. The placement of the *Start* gate also determines the extent (number of degrees) of the turn.

3) If you want to be towed onto a downwind leg:
   Place the *Start* gate on the downwind leg, or somewhere along the extended downwind, on the traffic pattern side of the airport. Set the *Aerotow Height* at pattern altitude (AGL).

4) If you want the tug to take you back over the airport:
   Place the *Start* gate on the airport.

5) If you want the tug to make a bunch of seemingly random turns:
   Place the *Start* gate near the airport and assign an *Aerotow Height* that ensures the tug will reach the *Start* gate well before reaching release altitude. Upon arriving at the *Start* gate, the tug will begin flying around looking for lift, making turns as needed to intercept a series of nearby thermals. As a reminder, after the glider releases, the tug will make a beeline for airport, with the odds of a left turn after release at about 50/50.

6) If you want to simulate premature terminations of the tow:
   Assign the *Aerotow Height* and place the *Start* gate as needed to achieve the desired result.

Next Time
In the next instruction-related Condor Corner, we will continue with Round-2 of Features, Tips, and Tricks. Until then, keep those cards and letters coming.

smanley@wisc.edu

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Scott Manley owns, and occasionally actually flies, a DG-303. The back of his pilot's license reads: Commercial pilot: airplane single-engine land & sea; instrument airplane; glider. He lives in Madison, Wisconsin and flies as a commercial pilot, glider flight instructor, and tow pilot for Sylvania Soaring Adventures in Beloit, Wisconsin.