

Column: Condor Corner
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Anniversary:

I forgot to mention last time that April 2011 was the one-year anniversary of Condor Corner. So, happy belated birthday Condor Corner. I would like to congratulate and thank my co-author, Frank Paynter (TA) for carrying me and especially thank the readers of Soaring Magazine for their kind words and encouragement. Frank and I have received comments and questions from more than 75 Condor Corner readers in the U.S., Canada, and Europe. I am not quite out of material yet, and Frank never will be, so I suspect we can all look forward to celebrating the terrible-twos with Condor Corner.

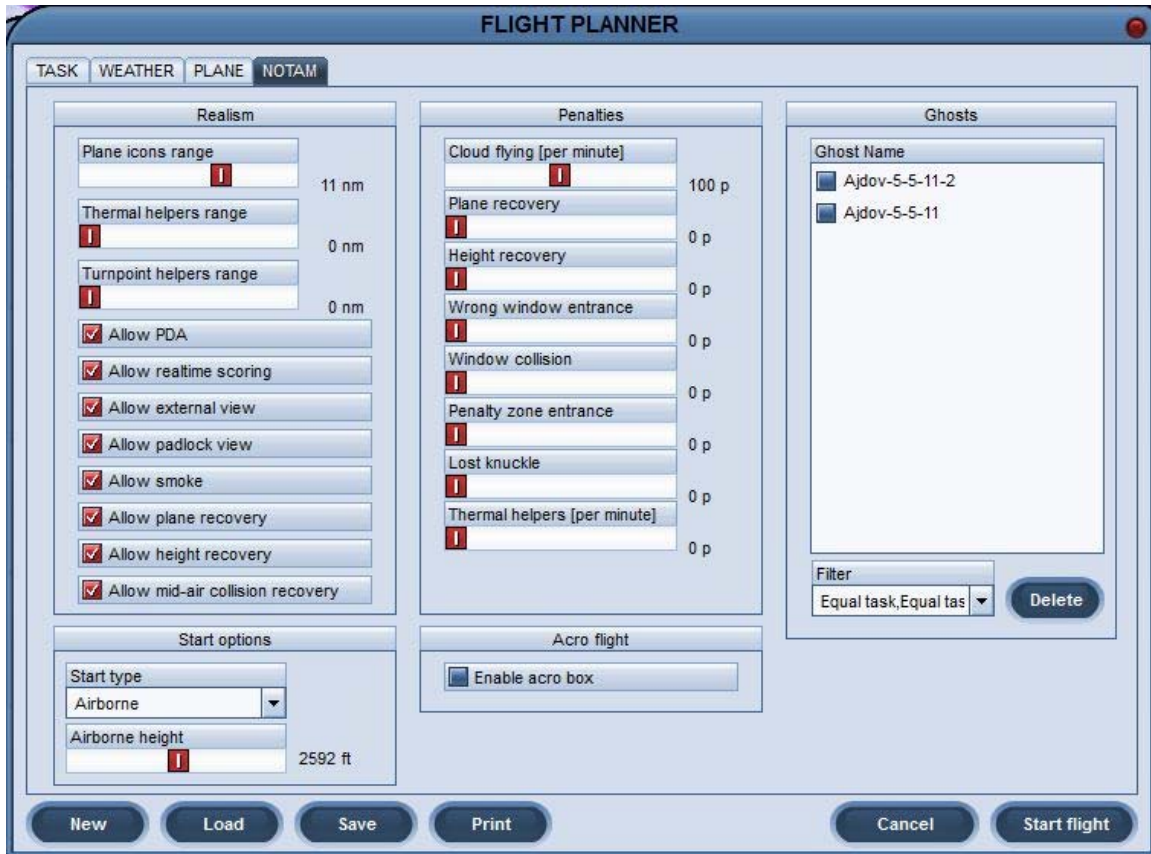
Introduction:

In April, we continued the arduous task of covering Condor's *Flight Planner* function by taking a closer look at the *Weather* and *Plane* components. This month, we will finish up our review of the *Flight Planner* with a discussion of the *NOTAM* component.

Note: Condor-specific terms are in *Italics*.

Flight Plan Component #4 - NOTAM

The *NOTAM* panel is comprised of five sub-panels: *Realism*, *Penalties*, *Ghosts*, *Start Options*, and *Acro Flight*. I haven't found an instructional use for the *Penalties* and *Acro Flight* sub-functions, so I won't cover those in this article.



Realism

The *Realism* sub-panel contains a number of instructionally useful features.

Thermal Helper Range determines how close a thermal needs to be to your glider in order for you to see it. A useful, practical value is 3 nautical miles. You use the “H” key on your keyboard to toggle the *Thermal Helper* on/off. The *Thermal Helper Range*, however, defaults to zero nm, so if you hit the “H” key and nothing happens, you probably forgot to set the *Thermal Helper Range* to something greater than zero.

Turn-point Helper Range works like *Thermal Helper Range* and determines the proximity of visible turn-points. Turn-points are toggled on/off using the “J” key. This parameter also defaults to zero nm.

Allow PDA determines whether your glider comes equipped with a PDA. The ASK-13, which I use for most of my primary training, cannot be equipped with a PDA, even if the *Allow PDA* box is checked. The same is true of the aerobatic MDM-Fox. I think you can opt for a PDA in most every other glider. Not having purchased the other *Plane Packs*, I don’t know if the PW5 and club-class ships use PDAs. I suspect they do. For most primary instruction, I don’t need a PDA, but for initial cross-country instruction, it comes in pretty handy. Being able to display the turn-points using the “J” key helps my students visualize and therefore better understand what the PDA screens are telling them. As with

Thermal Helpers, however, the objective is to gradually wean the student off the visible turn-points.

Allow External View enables all of Condor's views outside of the glider cockpit. For instructional purposes, you want this box checked. The more ways you can help the student visualize a situation the better. In the real world, of course, the only available view is from inside the cockpit, so to most accurately simulate the real world, you would leave this box unchecked.

I suspect the ***Allow Smoke*** feature was meant for aerobatic routines. It is, however, a very useful instructional tool. Because the smoke trails parallel the relative wind/flight path, "Smoke On" helps the student visualize angle of attack during stalls and spins, and to visualize the glider's flight path in turns, and thermals. On "follow the leader" instructional flights, like ridge flying and thermal flying, the smoke trails make it much easier for the student to visualize and follow the instructor's lead. Keyboard letter "T" toggles the smoke on/off, but only if the ***Allow Smoke*** box is checked.

Allow Plane Recovery is one of the "miracle" features available in Condor. In the event you do something that causes parts to come off your aircraft (e.g. overstressing the glider), pressing the letter "Q" on your keyboard reassembles your ship in mid-air, but only if the ***Allow Plane Recovery*** box is checked. Otherwise, you get to watch as your ship (or what remains of it) spirals all the way to the ground. Mercifully, upon disintegration of your aircraft, Condor switches to an external view so you can imagine that what you are watching is actually someone else spiraling to his or her death.

Allow Height Recovery is a particularly useful instructional feature. It is another of the miracle ("Q") features and provides you with an additional 1500 ft of altitude anytime you want it. So, if your students need to stay in the air for an hour or two to practice making coordinated turns, no problem. They just hit the "Q" key whenever they get low.

There is a limit (3) to the number of times the "Q" key will buy you an extra 1500 ft. So this function will not allow you to explore outer space. There must also be some upper altitude limit on the function, because sometimes you are allowed only 1 or 2 jumps up. 'Haven't yet figured out exactly how that works.

The Height Recovery feature also comes in handy when practicing approaches and landings, especially "landings out". Once on the ground, you can use the "Q" key to immediately put yourself back into the air. It is the ultimate self-launch, but cannot be used as the initial launch method.

A word of warning: If you have specified ***Allow Height Recovery***, but have not specified ***Allow Plane Recovery***, and you have crashed, pressing the "Q" button will simply loft your wrecked aircraft 1500 hundred feet into the air and let you watch as it falls back to earth.

Allow Mid-Air Collision Recovery is the last of the miracle (“Q”) features and enables you to completely and instantly repair your ship, in flight, in the event it is damaged in a mid-air collision. With Condor’s limited field of view, mid-air collisions are more likely. For instructional purposes, this feature enables you to continue a flight lesson that might otherwise be cut short by a mid-air.

By the way, to the best of my knowledge, it is not possible to have a mid-air collision with a Ghost (see below) nor with the tow plane. Your ship, a Ghost, and/or the tug can all simultaneously occupy the same point in space, without experiencing a simulated collision.

Start Options

Condor lets you start your flight in one of three ways: *Aerotow* (default), *Winch*, and *Airborne*.

Aerotow in Condor is more difficult than it is in real life. For openers, Condor uses a 100-foot towrope. Try that in real life and see how you like it. The short rope exaggerates any flaws in your technique and the limited field of view in Condor makes it more difficult to recognize when you’re moving out of position. The good news, however, is that if you can learn to stay in position on tow in Condor, flying a real-life aerotow should be a piece of cake.

When you select *Aerotow* from the *Start Type* menu, Condor provides you with an *Aerotow Height* slide bar that lets you set a release altitude anywhere from 164 ft (50 meters) to 4921 feet (1500 meters) with a default value of 2297 feet (700 meters) AGL. For instructional purposes, this range of release altitudes lets you simulate low altitude tug failures, normal aerotows, and long high tows that provide the student with ample time to practice staying in position or performing multiple wake boxing maneuvers before having to release.

The second start option is the ***Winch*** launch. I have never winch launched in real life, but those who have tell me Condor’s winch launch simulation is a good one. When you select the *Winch* start type, Condor provides a *Rope Break Probability* slide bar with a range of zero to 100 percent and a default value of 1%.

For primary instruction, my favorite start option is the ***Airborne*** start. If the day’s lesson is best learned in the air, why not just start there? The *Airborne* start uses an *Airborne Height* slide bar with the same range and default values as the *Aerotow* start.



Thermaling with a Ghost



Ghosts

In my opinion, the implementation of *Ghosts* is one of most creative, fun, and educationally useful features of the Condor software. It is not an easy concept to describe, however, so I'm going to start the discussion with my best shot at a definition:

A *Ghost* is the graphic (visual) reproduction of a previously conducted Condor *Free Flight* session, within your current (live) *Free Flight* session.

Condor generates a *Ghost* using what it calls a *Flight Track* file, so to understand what a *Ghost* is, you first need to know what a Condor *Flight Track* is.

A *Flight Track* is the Condor equivalent of an IGC file. Just like a real life flight data logger, Condor is continuously recording your *Free Flight* parameters (e.g. latitude, longitude, time, airspeed, vertical speed, altitude, etc.). At the conclusion of your *Free Flight* session, you have the option of saving the complete set of parameter records as a *Flight Track*. As you exit *Free Flight*, simply select *Save Flight Track* from the list of options on the *Debriefing* panel. When Condor displays the *Save Flight Track* panel, give your *Flight Track* a name and click "OK".

To use your new *Flight Track* file as a *Ghost*, simply initiate another *Free Flight* session using the same *Flight Plan*. On the *NOTAM* page of your *Flight Plan*, your new *Flight Track* file name "should" appear in the *Ghost Name* list box. Check the box to the left of your *Flight Track* (*Ghost*) name and select *Start Flight*.

As your flight begins, you will see what appears to be another glider sharing your airspace. The other glider, however is just a "*Ghost*"; a graphic (visual) reproduction of your previous flight. While you have complete control over your *Free Flight* glider, you have no control over the *Ghost*. The *Ghost* ship will simply repeat the flight that originated it.

Two paragraphs above, I mentioned Condor "should" display your *Flight Track* file name in the *Ghost Name* list box. Here is why it might not.

In addition to the *Flight Track*-specific parameter data, a Condor *Flight Track* file also contains information about the *Flight Plan* used to create it. If the currently loaded *Flight Plan* differs from the *Flight Plan* used to create a *Flight Track*, that *Flight Track* will not appear in the *Ghost Name* list by default. Enter the *Ghost* "*Filter*" function.

Below the *Ghost Name* list box is the "*Filter*" drop down menu. As you remove (uncheck) the various filter specifications, Condor become less restrictive in its display of available *Ghost Flight Tracks*. For example, if within your currently loaded flight plan you have elected to fly a Standard Class glider, Condor will, by default, display only *Ghost Names* (*Flight Tracks*) that also specify a Standard Class glider. To remove that constraint, simply uncheck the "*Equal Plan Class*" *Filter* specification.

The *Ghosts* sub-function enables you to incorporate any previously recorded *Flight Track* into your *Free Flight* session, including *Flight Tracks* sent to you by your friends. So,

the fun and interesting stuff you can do with *Ghosts* is pretty much limited only by your imagination.

In his Cross-Country / Competition articles, my co-author Frank Paynter talks about how he uses *Ghosts* to refine his strategies by repeatedly racing “himself” around a task.

Here are a couple of examples of how I have used *Ghosts* for instructional purposes.

To introduce my students to the challenges of sharing a traffic pattern with other gliders, I repeatedly flew the traffic pattern at one of Condor’s airports, and saved each session’s *Flight Track*. I then provided my students with the *Flight Plan* and my set of *Flight Track* files and asked them to incorporate my *Flight Tracks (Ghosts)* into their *Free Flight* of the traffic pattern. My students suddenly found they were no longer alone in the traffic pattern.



Thermaling with a Ghost



I used this same technique to introduce my students to sharing a thermal with one or more gliders and to experience, first hand, the right-of-way rules on a ridge.

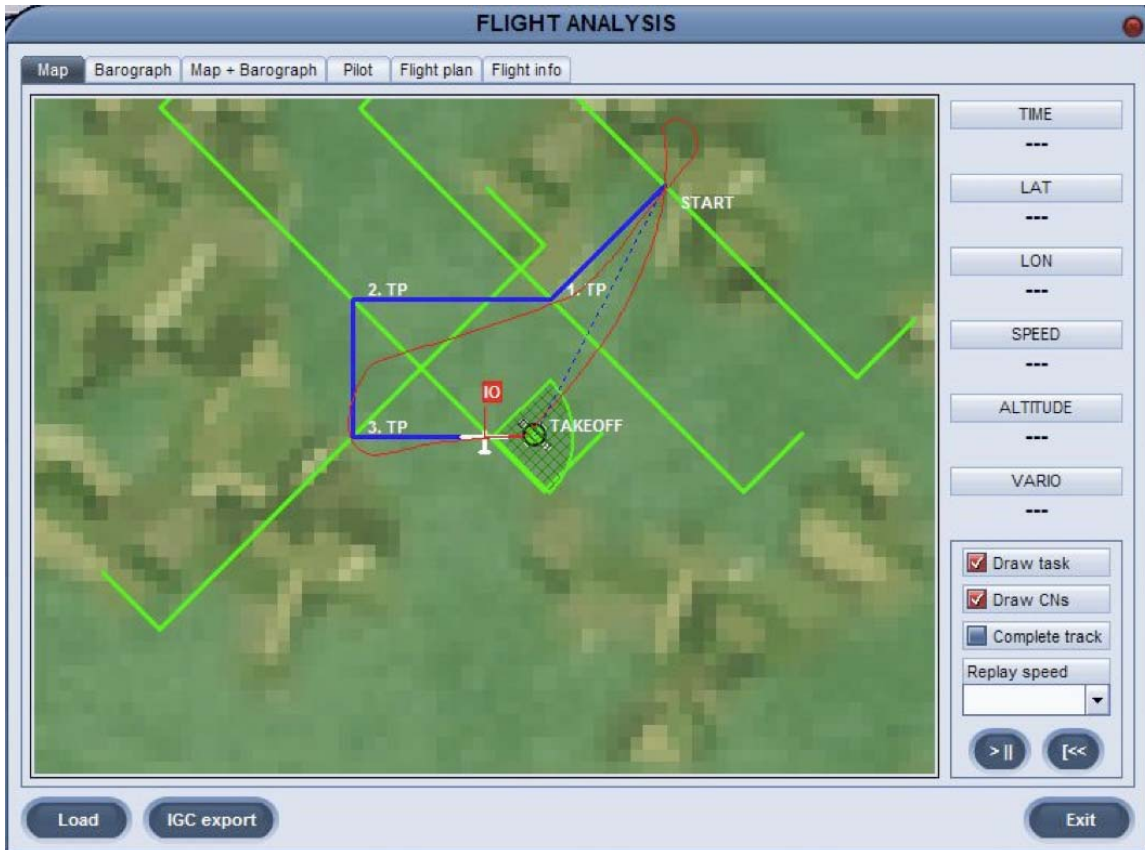
Finally, I used *Ghosts* to generate a *Replay* file that helps my students visualize how a glider polar is derived. I flew a series of glides in an ASK-13, each flight starting from the same point in space, at the same instant in time, proceeding in the same direction, and lasting exactly 1 minute. The only difference on each flight was the airspeed flown (minimum controllable – 32 knots, minimum sink – 34 knots, best glide – 42 knots, recommended approach – 48 knots, one additional higher speed – 55 knots). I recorded each speed flight as a *Flight Track*. On the final flight, my ASK-13 served as the camera platform from which to collectively observe the relative positions in space of each of the speed-specific flights, which I had selected as *Ghosts*. The result is pictured in this article.



Find the Glider Polar in this picture

While we are on the subject of *Flight Track* files, Condor has a *Flight Analysis* function available from the main page for any previously saved *Flight Tracks* and from the *Debriefing* page for a just-completed *Free Flight*. The *Flight Analysis* function provides a 2-D playback of a flight's ground track, a barograph plot, and some basic statistics. Playback speed options vary from 1X to 64X and multiple *Flight Tracks* can be loaded and reviewed simultaneously.

For instructional purposes, I have used *Flight Analysis* ground tracks to help my students understand and appreciate the effect of crosswinds on flying a traffic pattern.



Effect of a Crosswind on the Traffic Pattern

Next Time

In the next instruction-related Condor Corner, I'll take you into the main page *Setup* function, tell you what I know how stuff there works, and show you how I set things, including joystick control assignments, and why. 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.