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Introduction:
Very early on in Condor Corner, I introduced you to my list of "Instructional Challenges". Number 4 on the list was "The Weather Never Cooperates". In fact, the weather is just one of several environmental considerations that routinely have a rather dramatic impact on our ability to conduct conventional flight lessons, in the proper sequence and in a timely manner, and in some cases, to conduct them at all.

One of the great advantages of flight simulation over conventional instruction is that we have nearly complete control over our instructional environment. The venue for our lessons can vary as needed. The weather is always exactly what we need it to be. The equipment (glider, tow plane, winch) is always ready to go, and there is no contention for any of these resources. And, as if all that isn't enough, flight simulation goes beyond conventional environmental reality, enabling us to see and do things not possible in real life.

In this month's Condor Corner, we will continue with the theme of "Features, Tips, and Tricks" by focusing on our amazing ability within flight simulation to control our instructional environment.

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

Overview:
Environmental control in Condor is implemented using the *Flight Planner* function. The *Flight Planner* is initiated from Condor's main page by selecting either "*Free Flight*" or "*Multiplayer*" mode. In this article, I will describe flight planning in *Free Flight*. The process is only slightly different in *Multiplayer*.

The *Flight Planner* function is used to specify a set of approximately 40 parameters that collectively defines the flight environment for a given Condor session. A complete set of parameters is called a "*Flight Plan*" and comprises fours subsets of related parameters: *Task, Weather, Plane*, and *NOTAM*.

Condor comes complete with a set of pre-defined (*Default*) flight plans, but the really powerful feature of the software is your ability to create, modify, save, delete, reuse, print, execute, and share your own, "custom" (*User*) flight plans.

The task of describing the flight planning process in detail reminds me of the joke "How do you eat an elephant?" The answer, of course, is "One bite at a time." So let's take our first few bites out of this pachyderm by looking at the *Flight Plan* file functions and the first of four *Flight Plan* parameter subsets, the *Task*.

Flight Plan File Functions

The *Flight Plan* file functions are available via a series of buttons located along the bottom of the *Flight Planner* page. They are:

New

This function clears the existing flight plan and sets each of the available flight plan parameters to a default value, with the notable exception of the *Task Points* (more on that later).

As part of my preparation to teach a lesson for the first time, I use this function to establish the ideal environment for the lesson by creating the necessary task points (usually only 2) and modifying other default parameters as needed.

For example, Condor's default *Time* of day is 12:00 PM. For instructional purposes, I often want a calm, smooth air mass, so I change the *Time* of day to 9:00 AM to help ensure a tranquil atmosphere.

Save

Once I have all the flight plan parameters set as needed, I am able to save my new flight plan for future use. Clicking the "*Save*" button opens the "*Save Flight Plan*" page and allows me to name the new flight plan. Clicking OK seals the deal.

Flight Plan files you create are stored in the "C:/PROGRAM_FILES/CONDOR/FLIGHTPLANS/USER" directory and have a file type suffix of ".FPL". You only need to know this if you are sharing *Flight Plan* files with other Condor users. Flight Plan files are quite small and can easily be shared as email attachments.

I often send my students the *Flight Plan* they need for a particular lesson. This saves them the trouble of having to create their own *Flight Plan* and ensures consistency.

I use some *Flight Plans* for more than one lesson. For example, the following table lists a number of *Flight Plans* I have created, along with the lessons that use them.

Flight Plan Name	Lesson(s).
1. Calm Air	Airspeed Control, Turning Flight
2. Traffic Pattern	Descent Control, The Traffic Pattern, Landing
3. X-Wind 15	Crabbing Flight, Slipping Flight, Crosswind Traffic Patterns, Crosswind Landings
4. Aerotow 1, 2, 3, 4	A series of increasingly complex aerotows
5. Ridge Flight	Ridge Flight
6. X-Country	Thermaling, Introduction to Cross Country Flight and Navigation

Load

Once you have a *Flight Plan* saved, you can simply retrieve and reuse it anytime. Clicking the "*Load*" button takes you to the "*Load Flight Plan*" page. Your custom *Flight Plans* will be found in the "*User Flight Plans*" library.

For example, whenever I need to teach the "Traffic Pattern" lesson, I simply load the "Traffic Pattern" flight plan and I'm all set to go.

You can make modifications to an existing flight plan by loading it into the *Flight Planner*, making the necessary changes, and then resaving it using the "same" file name.

You can quickly create a series of similar flight plans by loading an existing flight plan, making the needed changes, and the saving the modified plan using a "new" file name. I used this trick to create the Aerotow 1-4 series of flight plans. The four flight plans are identical except for the location of the *Start* task point.

Print
Apparently you can print a *Flight Plan*. I haven't yet found a reason to do this.

Cancel
Clicking the "*Cancel*" button closes the *Flight Planner* function and returns you to Condor's main page. Unless you first *Saved* the Flight Plan, however, any changes you made will be lost.

Start Flight
This function takes the *Flight Plan* you created, or loaded, and executes it. The Condor application engine takes in all the parameters specified in your *Flight Plan* and uses them to build the session environment. As the session initiates, you see a static image screen with a progress/status bar at the bottom flashing you messages like "*Loading Terrain Features*", "*Calculating Weather*", "*Loading Planes*", etc. The next thing you know, you are sitting in the glider of your choice looking out at the world you created specifically for this flight lesson. 'Pretty amazing stuff.

Once you start a *Flight Plan*, Condor will retain that *Flight Plan* in the *Flight Planner* until you create or load a new one, even if you close the Condor application and/or shut down your computer.
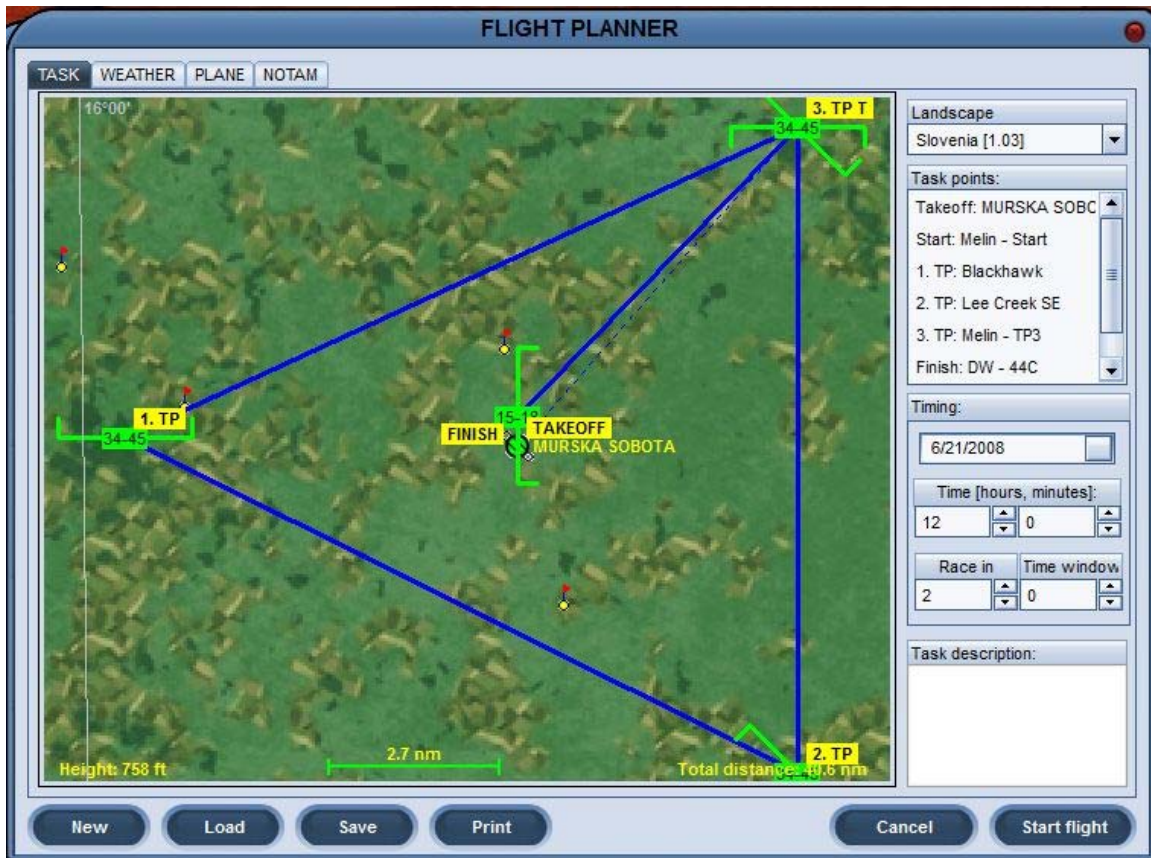
Flight Plan Function Buttons
Introduction to Cross-Country – Task Page

Flight Plan Component #1 – The Task
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 *Task* page is the first one you see when you enter the *Flight Planner*. The *Task* page
is comprised of the *Landscape, Timing, Task Description*, and *Terrain Map* sections.
Here is how I use each section for instructional purposes.

Landscape
The default Condor *Landscape* is a section of the developer's home country of
Slovenia (north and east of Italy). Fortunately, this relatively small area of the planet
has all the terrain features I need for glider flight instruction. It has completely flat
areas that provide the unobstructed horizon needed for primary training. It has some
beautiful, long ridges and some very mountainous areas where wave flight can be
experienced.

You can move around in the *Landscape* by clicking/dragging the terrain map. A right mouse click on the terrain map lets you rescale the map using the *View Zoom In/Out* functions and offers a "*Height Map*" option that uses color to differentiate terrain elevations.

In general, simulation landscapes are relatively featureless. Condor's landscapes are no exception. The large-scale terrain features (mountains, lakes, etc.) are clearly obvious, but there are no roads, towns are tiny, wooded areas are sparse etc. One instructional advantage of this relatively featureless landscape is that students can't rely on ground features (like the local barn) to determine their position in the traffic pattern. They are forced to use depth perception and angles to make a proper approach.

Unlike Microsoft FSX, the entire world's landscape is not available in Condor. There is a landscape development kit that allows folks with lots of time on their hands to develop a landscape for their own part of the world. In fact, new landscapes are being announced almost daily. Parts of the U.S. are already developed including Minden, parts of Texas, Mifflin, etc. For primary instructional purposes, however, I happen to believe it is better to instruct in unfamiliar territory. Lessons learned there can be applied anywhere.

Timing
This section of the *Task* tab includes a date, a *Time* of day, and the *Race In* and *Time Window* values.

The date value defaults to June 21 (first day of summer) of the current year. Clicking the shaded box to the right of the date opens a calendar window allowing you to easily change the date.

Time
The *Time* (of day) values determine the start time for your simulated flight. The *Time* defaults to noon. No surprise there. Condor is racing software and noon would be a good time to start a race. In the same way, however, certain flight lessons are best taught at certain times of the day. For example, I prefer to introduce my students to aerotowing in the calm, quiet, smooth air masses characteristic of the early morning or early evening. Thermal flying instruction would best done from late morning through late afternoon. Being able to control the instructional time of day helps ensure the flight environment is ideal for the day's lesson.

Race In / Time Window
Race In and *Time Window* are basically countdown timers used for competition flying. I have yet to find an instructional use for them.

Terrain Map
A *Task* is composed of what Condor calls "*Task Points*". *Task Point* types include the "*Takeoff*" (an airport), and "*TP*" (turn) points. Condor further classifies and

labels turn points as either "*Start*", "*#.TP*" (# is a number), or "*Finish*", depending on the turn point's sequence in the *Task*. The only required *Task Points* are *Takeoff* (airport) and *Start*.

So, from an instructional standpoint, for any given *Flight Plan*, I create only as many *Task Points* as the lesson or Condor requires; usually only *Takeoff* (airport) and *Start*. Creating this simple task is quick and easy.

1. Click *New* to start a new *Flight Plan,* then OK to confirm
2. Place your mouse on the airport icon
3. Click the left mouse button three times

You will see the *Takeoff* airport name and *Start* turn point (also the airport name) listed in the *Task Points* window and displayed graphically on the terrain map.

If you need to reposition the *Start* for the purpose of controlling the tow plane, move your cursor over the airport until the cursor displays as a set of crossed, double-headed arrows. Click/drag the *Start* to the desired location.

Airport
The default Slovenia 1.03 landscape has 8 airports to choose from. Based on the lesson objectives, I select the most appropriate airport, taking into consideration the local terrain, the number of runways, runway surface composition, runway orientation, and the number and location of buildings on the airport.

Unfortunately, you cannot determine much about the airport by looking at the terrain map. The airport icons are all identical and the diagonal runway indication on each icon does not correspond to the airport's actual runway configuration. To see what an airport really looks like, you need to establish a simple task taking off from that airport and start a session. A Condor session begins with your glider on (or directly above) the approach end of the selected airport's active runway. Once there, you can use your magnetic compass to determine the runway heading and/or use your ability to look around (from the cockpit and externally) to take look at the airport and the surrounding area.

I do most of my primary training at the Murska Sobota airport in the far northeast quadrant of the Slovenia 1.03 landscape. The airport has a single, grass runway (9-27) with a building complex on the north side of the runway at the approach end of runway 27. The terrain around Murska Sobota is completely flat, providing a clear view of the horizon in all directions. 'Just what I need to teach attitude flying.

As an example of using whatever is available to my instructional advantage, I use the buildings on the airport in my lessons on premature tow terminations. By setting up a left crosswind on Runway 9, the Murska Sobota airport buildings become obstacles in the event of a low-altitude rope break. During the pre-takeoff checklist, the student is expected to provide an emergency plan. A student using rote learning will, based on

the direction of the wind, suggest a left reversing turn (into the wind) in the event of a low-altitude rope break. My response is: "You mean directly into those buildings?" Lesson learned. Think!

Turn Points
Condor turns points are characterized by a set of properties including:
- Name
- Latitude
- Longitude
- Elevation
- Sector Type (Classic, Window)
- Radius
- Angle
- Minimum Altitude (base of the sector)
- Maximum Altitude (ceiling of the sector).

The latitude, longitude, and elevation properties are determined by the turn point's location on the terrain map. The other properties each have a default value. A turn point's properties can be viewed or modified using the "*TP Properties*" window invoked by placing your cursor over the turn point icon, right-clicking, and selecting "Properties". You can also highlight a turn point name in the *Task Points* list with a left click, then right click and select "Properties".

As an instructor, I end up using Condor's turn points in ways the developers probably never envisioned and in ways they did. Here are a couple examples.

1. Rather than using it to start a race, my placement of the *Start* turn point is meant to trick the tow plane into flying where I want it to fly. (See December 2010 Condor Corner – Controlling the Tow Plane). If the lesson doesn't require an aerotow (many lessons do not), it doesn't matter where you put the *Start*.

2. Real-world competition flying doesn't use anything like Condor's "*Window*" Sector Type. Interestingly, however, the most advanced real-world aircraft navigation systems under development today use a concept called HITS (Highway In The Sky) to display a sequence of "Windows" that intuitively guide the pilot through 3-dimensional space.

   I was able to use Condor's Window turn points to create a HITS *Task* to help my students visualize and learn to fly a standard glider traffic pattern. The *Flight Planner Task* page for this HITS flight plan and a pilot's eye view of the HITS traffic pattern are pictured in this article.

3. In a flight plan to introduce Cross Country Flying and Navigation, I used Window turn points to form a 33 NM triangular course around a simulated home airport. Each Window's base altitude ensures the pilot final glide

capability back to the home airport with the Window's ceiling altitude enforcing Class E airspace cloud base clearance requirements. The *Finish* Window base and ceiling altitudes require the pilot to return to the airport at 1000 ft AGL, mid-field, downwind.

That's all for this installment of Condor Corner boys and girls. I have once again exceeded my allotted word count.
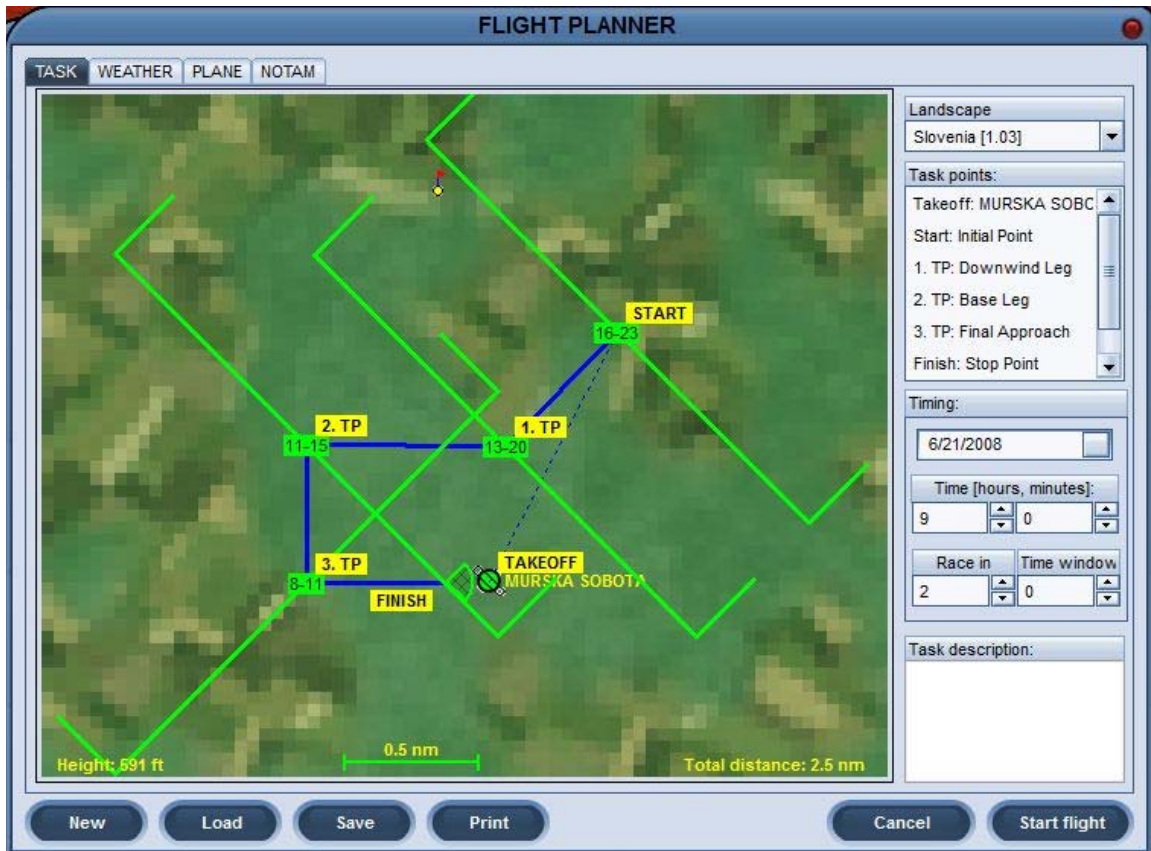
HITS (Highway in the Sky) – Traffic Pattern Flight Plan
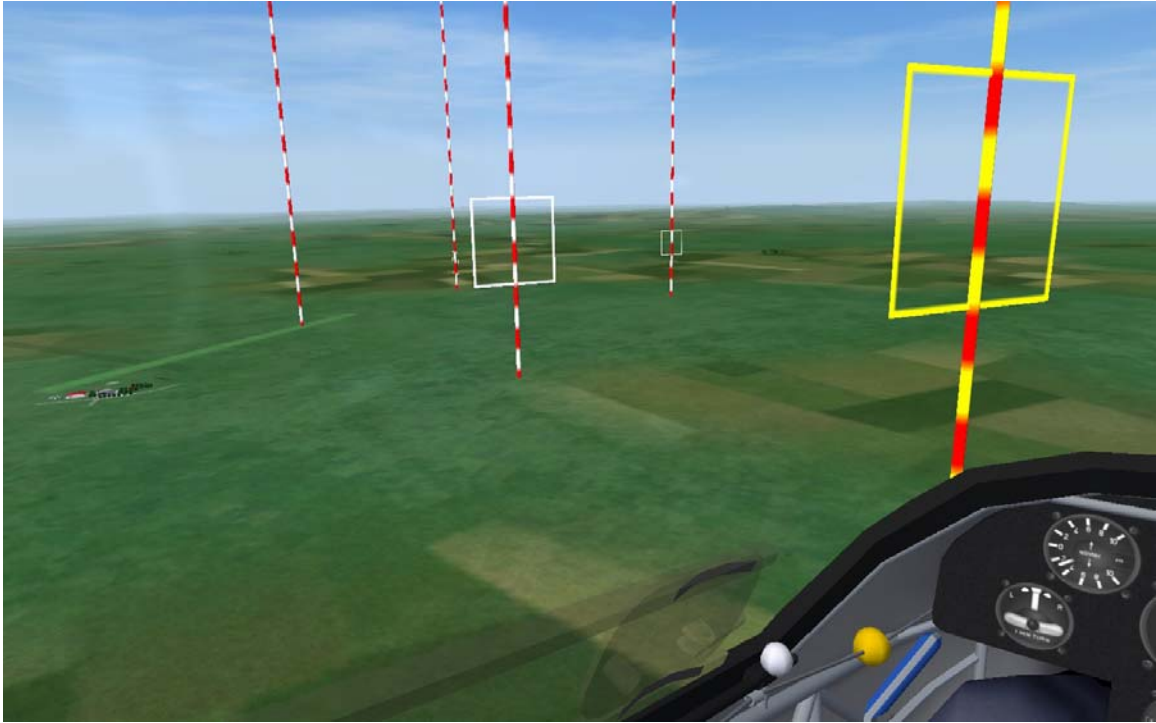
HITS (Highway in the Sky) – Pilot's Eve View

Next Time
In the next instruction-related Condor Corner, Round-3 of the Features, Tips, and Tricks theme, we will continue our review of the *Flight Planner* by looking at controlling the weather, selecting and learning about our glider, and all the fun stuff available on the *NOTAM* page. Until then, keep those cards and letters coming. smanley@wisc.edu

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