Condor Manual Supplement

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Condor Operation – Getting Started

Specific to SCOH Equipment in the Clubhouse

1. Turn on the computer (on the bottom shelf, at the left end, On/Off button is on the front near the top)

2. Turn on the TV using the remote (look for light to illuminate at bottom left of the TV)

3. Use the TV remote controller to select the computer as input. INPUT button at top of remote, on the TV screen select “HDMI” as the input. The TV will display a landscape image.

4. Check that the keyboard and rudder pedals are each plugged into USB ports on the front of the computer at the bottom

5. Press “Enter” on the keyboard to display the Password screen to unlock the computer. Password is SCOH (all caps). TV displays a home screen showing SCOH ground ops as background.

6. TV volume is adjusted with the TV remote. A sound bar is on the shelf below the TV. A vertical column of small white lights on the left end of the sound bar indicates the volume level. Once you are in Condor, adjust the volume to be able to hear the wind noise, instruments, and controls. Normally, full or almost full volume works best.

7. The Condor program is started by double left clicking on the “Condor” icon displayed on the home screen.

8. Make yourself comfortable: 1. Note that the rudder pedals slide fore/aft and also “rock” by pushing with your toes. The sliding motion works the rudder. The rocking motion does nothing. Position yourself in the chair so that you can comfortably operate the rudder pedals. 2. You may find in most comfortable to set the joystick controller on your lap. 3. You’ll need to use the keyboard to adjust the “views” during the flight so keep it within reach.

9. Keyboard ops: There is a label on the table that describes the various keyboard controls. The cockpit view, external view, and chase view are all useful. The hat switch on the controller is used to adjust these views. You can also control the viewing by left click/hold the left mouse button and moving the mouse. The zoom button on the joystick allows a closer view of the cockpit instruments. The “Q” button increases your altitude by 1500 ft. which can be handy. If you are in Free Flight or Flight Plan/Try Lesson and are unable to change the view, use F9 to set “Replay Camera Off” (message shows on lower right corner of screen) and this will allow you to change views.

10. Follow the “How to Use This Book” instructions on the next page. Use the Syllabus Diagram (flow chart) and the Lesson Plans to step through training in a logical and thorough manner.

11. Instructions for how to load/use “replay files” (.rpy) and “flight plan files” (.fpl) are included on separate pages following the How to Use This Book instructions.

12. The “Pause” button on the base of the joystick controller. Pausing the flight allows discussion and evaluation during the flight.

13. The Esc key on the keyboard starts and stops whatever is happening. Use Esc to start a Flight School/View Lesson or Flight School/Try Lesson. Esc will stop a Try Lesson session. It doesn’t stop the View Lesson session, which will need to run to its end. Use Esc to start and stop View Replay or Free Flight.

14. The program is always recording your flight if you are in “Free Flight”. If you are in “Flight School”, there is a not a way to record your flight. If you want to save the recording of the flight, select “save replay” when the screen displays that option as you exit the flight. Replaying the flight and discussing it with the instructor is a great learning tool.

15. Sometimes in Flight School after clicking on View Lesson - Try Lesson, or in Free Flight/Flight Plan, or in View Replay after selecting the file, the large dialog box remains on the screen and nothing else happens. Move the mouse arrow off to the side of the box and left click to make the box go away.

16. Aero Tow: Condor simulation is generally pretty realistic, but the aerotow is much more difficult than the real world. It appears that Condor uses a very short rope (maybe 100ft) and the gliders behave as if they have a cg tow hook, both of which makes the aerotow more difficult. Experienced Condor instructors all say that Condor aero tow should be saved until later in the training, but everyone seems to want to give this a try early on -- don’t be discouraged if you have trouble. If you can do an aerotow on Condor you should do fine in the real world. On aerotow a large forward trim (more than in the real world) is required (-60 shows on the lower right corner of the screen) in order to have any hope of completing the Condor aerotow. Flying with the spoilers fully deployed during a Condor aerotow helps to keep the rope tight and reduces the tendency to overrun the tow plane (Obviously you **DON’T** do this in the real world).

Introduction

If you are brand new to Condor, start by reviewing these resources in order:

1. For a general introduction to Condor and reasons why Condor should be used for primary glider flight instruction, follow this LINK.
2. This doc is intended to supplement the real Condor Flight manual, LINK.
3. Frequently Asked Questions
4. Visit this LINK for advice, more resources and hardware sales.

This Condor Manual Supplement is written with primary student or instructor in mind. This manual is meant to describe the “How To” aspect that may not be described elsewhere. Most of the content in this manual was gleaned from the Condor Corner articles that were published in Soaring magazine from 2010-2014, LINK.

Views

In actual flight, there is one view of the world; inside the cockpit looking out. Condor provides this same perspective, albeit with a somewhat limited field of vision. Condor, however, goes on to provide an impressive array of additional perspectives not readily available in real life, including:

F1 cockpit
F2 External Glider. Use mouse or hat on stick to change the viewing angle. Left, right, up down.
F3.1 (first selection) Chase
F3.2 (second selection) Front
F3.3 (third selection) Right Wing
F3.4 (fourth selection) Top of the tail
F4 Tower view. On the airport looking up at the glider.
F5 External Tow Plane (if on tow)
F6 Fly By - the glider flies by a fixed point in space. Resets with every selection of F6.
F9 Replay Camera Off/On Toggle. The default is ON, which causes Condor to use only the originally recorded view settings. By default, a Replay behaves just like any recorded video would. A Replay file, however, is not a video file. It is a parameter file capable of generating any of Condor’s point-of-view graphics. Turning the Replay Camera – OFF, makes all of Condor’s view functions (and zoom) available at any point in the playback.

This incredibly diverse viewing capability helps ensure the student’s mental grasp of the learning objective. The student can visualize airspeed control, turn coordination, descent control, glide angles, tow position, landing flare, and a myriad of other important soaring concepts, and develop a good understanding of each objective well before experiencing it in actual flight.

Pause

As a glider flight instructor (or as a student), imagine that during any actual flight, you could simply stop the action, have a calm and informative conversation about what was happening, and then, when you were good and ready, resume the flight. In Condor, you can do exactly that - select the “Pause”

function. This function is an “Instructional Super-Weapon”. While paused, you can invoke any of the view features described above. From an instructional standpoint, this is incredibly powerful stuff.

Virtual Reality

Some argue you can’t do everything in a simulator you can do in real flight. That is true, but so is the counter argument. There are things you can do in simulation that can’t be done in real life. Simulation enables the student to visualize, and thereby understand, very important concepts. Some of these virtual reality features include:

- **Thermal Helpers**: rising bubbles that show the thermal from the ground up to the cumulus cloud. Select “H” on the keyboard to turn thermal helper on/off.
- **Visible turn points:** Enables the student to visualize and better understand, cross-country navigation and competition tasks. Select “J” on the keyboard to toggle between turnpoints on/off.
- **Height recovery**: Provides the student with an additional 1500 ft of altitude on demand, allowing prolonged flight time. Select “Q” on the keyboard to add 1,500 feet of altitude.
- **Wingtip Smoke**: Helps the student visualize/trace a flight path; especially effective in visualizing a spin. Select “T” on the keyboard to toggle smoke on/off.
- **Plane Recovery**: Enabling the student to recover from a structural failure caused by overstressing the aircraft or a mid-air collision. Select “Q” on the keyboard to recover from structural damage or a mid-air collision.

Flight School

Condor’s “Flight School” feature is a great way to demonstrate a maneuver followed by immediate practice flying the same maneuver in the same conditions. To start a lesson, choose “View Lesson” within the "Flight School" for the purposes of demonstration. After the demo, you can then practice flying the lesson by choosing "Try Lesson" within Flight School.

PRO: You can start at a very convenient point in space that is appropriate for that particular lesson. CON: You can't record the student's performance and then watch it again for a critique.

To see how this works, start condor > Flight School > "View Lesson" then go back and "Try Lesson".

Any replay file (.rpy) that is placed in the Custom folder (more to come)...

Watch this six minute YouTube video for a great introduction of how Condor can be used in a flight school environment. The video is trying to sell things but more than half of the video demonstrates how the flight school option in Condor can be used in Condor.

Replay Files

Replay files (.rpy) are used to demonstrate a concept - they can be viewed like a video. An important distinction between replay files and a traditional video; you have the ability to change the viewing

perspective when viewing a replay file within Condor. You can change back and forth between cockpit view, external view, etc.

Showing a Replay file followed by using a Flight Plan (see below) to fly a lesson is similar to “Flight School”. Any replay file can be inserted into the appropriate flight school folder and then used as described above in "Flight School". Essentially the same thing is accomplished by two different avenues. A replay file can be watched on its own. Or, a replay file can be placed into the appropriate "Flight School" folder and then used as described above in the section titled Flight School.

To load a Replay file; start Condor > View Replay > Choose a replay file > View

Follow this LINK to download pre-made “Replay” files.

Flight Plan

Flight Plan files (.fpl) make it convenient to start with a specified set of conditions for a particular lesson.

PRO; the student's flight is automatically recorded as long as you save it as you exit the flight. This allows a convenient way to critique the student's performance.

CON; You have two choices for starting points:

- You start from the beginning of the launch, aero tow or winch.
- Or, you can start directly over the airport and at any chosen altitude. This is convenient if you want to do upper air work or patterns.

To load a Flight Plan file; start Condor > Select “Free Flight” > Select “Load” > Select tab called “User Flight plans” > Select a Flight Plan

Follow this LINK to download pre-made “Flight Plan” files.

Smoke

Rules for Display of Smoke

1. In order for the Smoke to appear in a Replay, it had to be turned on during the Free Flight session that produced the Replay. Smoke on could have been allowed by the Flight Plan, but if it wasn't toggled on during the Free Flight, it can't be toggled on during the Replay. Smoke cannot be toggled on/off independently in the Replay from what was done in Free Flight.
2. In order for the Free Flight session to have Smoke-On capability, the Flight Plan used to generate the Free Flight had to "Allow Smoke". This value is set on the Realism sub-panel on the NOTAM page.
3. Keyboard letter "T" is the Condor default assignment for the Smoke toggle. It can, of course, be assigned to any control (other keyboard keys, joystick buttons, etc.)

Uses for Smoke in Instruction

Smoke is a powerful and important visual learning aid.

1. It represents the most difficult to visualize component of angle of attack, i.e. the relative wind or a "the flight path". The smoke trail always represents the wing's flight path, so with smoke on it is easy to compare the wing chord to the flight path. This helps the student visualize the stall, and the difference in AoA (and therefore induced drag) on the wings resulting in the autorotation of a spin.
2. Allows student to "follow" other gliders through flight maneuvers or during XC flights
3. Help students appreciate the helix being flown in a thermal.
4. Show students the loop they just performed or other acro/maneuvers.
5. Help students understand that a glider does not come to a stop, and then drop out of the sky as it stalls. This is the sensation from the cockpit; the glider literally falling out from under you. If you watch a Replay of a stall, from outside (F6 - Flyby view), with smoke on, you will see that the stall is physically much more like riding a roller-coaster over a hump. 'Not nearly as dramatic, and therefore fearful, as perceived.
6. Show that AoA has nothing to do with pitch attitude; the best example being the AoA during a winch launch accent. The glider is pitched up 45 degrees to the horizon, yet the AoA is no where near critical; actually much closer to cruise AoA (4-5 degrees).

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.

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.

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.

Create Lessons from Scratch

In the Introduction of this document, see the link to the compilation of Condor Corner articles in Soaring. Read pages 21-29 for a great description of the process of creating a lesson from scratch.