

The Condor Corner

Scott Manley & Frank Paynter

The Purpose of Condor Corner

The intent of 'The Condor Corner' is to talk about some of the ways that the superb Condor soaring simulator is being used by 'RL' (real life) glider pilots to increase their skills, experience soaring flight in different areas of the world, test their racing skills against other competitors, maintain their proficiency, and dramatically improve glider flight instruction. Each month we will present a short article that highlights the use of Condor as a flight training tool, for virtual cross-country badge and record attempts, or for on-line multi-player cross-country racing. Scott Manley and I will alternate, with Scott handling the instructional topics, and me (Frank Paynter) addressing cross-country / competition flying. Scott is an experienced CFGP and an advocate for the use of simulation in glider flight instruction. Frank is, for want of a better description, a completely fanatic, certifiably insane cross-country racing pilot.

For those of you out there that are already Condor pilots, please drop us a line and tell us about it; Scott and I would love to draw on your experiences in future columns. To a large degree, your input will determine whether this column prospers or withers away.

Contact Frank Paynter at 'paynterf@gmail.com' and/or Scott Manley at 'smanley@wisc.edu'.

What is Condor?

Condor - The Competition Soaring Simulator is, quite simply, the finest soaring simulator on the planet by far. 'Can't afford a \$200,000 ASG-29 or Ventus 2cx? No problem, step right up – both of these gliders, and many more, are available to fly right from your desktop, and the simulations are incredibly realistic – right down to the fabric patterns in the cockpit interiors. 'Have a beginning student that freaks out every time they try boxing the wake? You and your student can do them together in Condor, pausing the action as necessary to explain something or to look at the situation from different angles. 'Ever been frustrated watching a student's eyes glaze over as you once again preach about maintaining coordination in the pattern to avoid the dreaded base-to-final stall/spin disaster? No problem – you can realistically demonstrate this situation in Condor, complete with a wing-tucked-under, breath-stopping, cross-control stall. 'Won't take too many crashes before your student is watching the yaw string like, well, a Condor! Have you ever wanted to learn a little (or a lot) more about cross-country flying, but didn't have the glider or the confidence or the local mentoring support to get away from the airport? Now you can experience cross-country soaring in realistic conditions almost anywhere on the planet, without worrying about landing out or crashing. Want to test your cross-country racing skills against other pilots? Step right over here, and sign up for one of the many ongoing, online multi-player races going on at any time in Condor. Be sure to wear your asbestos undies though; some of the more popular European races draw hundreds of competitors, and they don't take prisoners. By contrast, the Monday Night Soaring races are run at times convenient for U.S. pilots and are beginner-friendly.

A Brief history

The Condor simulation software was written by Uroš Bergant and Gregor Rozman, both aviation and soaring enthusiasts from Slovenia. Uroš started the effort in 2000 as a way of combining a background in physics, a love of soaring, and a knack for graphics programming, and Gregor joined the effort in 2002. Condor was first released to the public in late 2005 with just one scenery (the authors' native Slovenia), and a half-dozen or so glider types. Since then it has gone through 12 significant revisions (called 'patches' in the Condor world), and now sports all the top glider types and user-contributed scenery's for every popular soaring site in the world (and some that are literally out of this world). The Condor web site host a number Forums (General, Support, Competition, etc.) where you can ask questions, get answers, and share information. For more detailed information about the program and the authors, see http://www.condorsim.fr/uros_en.htm.

Top level features

- Super high-fidelity 6-degrees of freedom (6DOF) flight physics engine
- All modern racing gliders and many 'club' gliders supported, complete with accurate flight physics and polar responses for each.
- High resolution photo-realistic scenery's for all popular soaring areas, including all of Europe, New Zealand, Australia, and many popular U.S. soaring sites.
- Highly realistic aerotow and winch launch simulations
- Highly realistic thermal generation. Thermals initiate off the ground, grow to form cumulus, mature, and then dissipate. There is a 'thermal helper' mode that makes nearby thermals visible – perfect for introductory thermalling instruction (disabled for most races, of course!)
- Highly realistic ridge soaring effects
- Designed and implemented from the ground up as an on-line multi-player racing platform. Pilots 'join' a race by logging on to a server, and 'nearby' (in the sim) gliders are depicted accurately in the field of view. The pilots can be anywhere on the planet, but will all appear to be in the same airspace, and the action is completely synchronized so everything happens in real time. A 3 hour race in Condor takes 3 hours in real time, so make sure to go to the bathroom first (there is a rudimentary autopilot for those of us with short-range tanks).

How to get started with Condor

All you need to get started with Condor is a decent computer with a good display and graphics card. It doesn't have to be a 'gaming' machine – almost anything less than about 3 years old will do fine. I use a 2-year-old Dell Precision M6300 laptop with 2GB RAM and the built-in NVIDIA graphics card. Condor runs only on Microsoft Windows - Mac users need a machine with an Intel processor and an operating system (e.g. Leopard, Snow Leopard) offering a feature called Boot-Camp. Condor will not run under Windows emulation. I use Windows XP Pro, but Vista and the new Windows 7 OS also work fine. Scott runs Condor on his Macintosh hardware booted into Windows. If you are running from a laptop like I do, an external mouse is highly recommended. You will

need a decent joystick, and a pair of USB rudder pedals (not absolutely required unless you are just getting started with glider flying - experienced soaring pilots can get away with auto-coordination and a twist-grip joystick). A complete, very detailed 'How To' document is available from the Soaring Magazine page on the SSA website .

Cross-country in Condor



From Frank Paynter, 'TA'

Here I am, in trouble - again! I'm down to 1000' AGL, scratching around in crappy lift. My landing options in this remote New Zealand valley are OK, but if I have to land it will be a loooonnnng retrieve and the end of my aspirations for this contest. The sweat is pouring off my face and my heart rate is elevated as I struggle not only with this crappy thermal, but with my own incipient panic. I *must* stay calm and focused if I want to dig out, but my inner coward is threatening to take over. Slowly I climb out of trouble, and eventually I get back up to an altitude that lets me continue on course. At the end of the day, I make it around the course in good order - not winning the day, but not embarrassing myself either. As I chat with my fellow competitors after the flight, I discover that most of them also had difficult patches, so I don't feel like a complete idiot. I wound up 15th for the day and 13th overall after three days - not too shabby after all, considering I'm one of only 3 U.S. pilots in the huge field of 125 competitors!

Stepping out of my beloved Ventus 2bx cockpit, I walk the five steps from my home office to the kitchen and grab a beer from the fridge, intending to regale my wife with all the details of my inspired and heroic exploits. My ever-so-diplomatic wife's first words

are "Go take a shower - you stink!" What? How did I get from a glider in New Zealand to a kitchen in Columbus, Ohio? Well, the answer is - I was competing in a recent 5-day Condor Grand Prix race series held at Omaramara, New Zealand, against the top glider pilots from all over the world, and while my mind and soul were in New Zealand, my body was still parked in front of my PC in Columbus, Ohio.

When most people think about soaring flight simulators, what comes to mind is something like the soaring simulation in Microsoft Flight Simulator, a very simple simulation of a generic glider and some puffy clouds over a landscape of Chicago or New York. The flight physics are mediocre at best, and the weather model is laughable. The Condor soaring simulator is more aptly comparable to the full-motion, six-degrees-of-freedom simulators used by airlines to train their pilots. In these airline simulators, it isn't unusual for pilots to emerge drenched in sweat after being wrung out with multiple emergency scenarios, and the same is true for Condor, except the "emergencies" are the minute-by-minute decisions and trials faced by cross-country racing pilots. While purists can (and do) argue that Condor flying is a pale shadow of RL (Real Life) flying, the preponderance of evidence shows that Condor is good enough to engage the same sorts of decision-making and flying skills as required in real life, and, as all modern professional flying organizations have found, training received and skills honed in 'good enough' simulators transfers efficiently to real-life situations. Condor is the first commercially available program to model the complexities of cross-country racing 'good enough' (and believe me, Condor races are far beyond just 'good enough') to be used as a serious trainer.

Now that I (hopefully) have your attention, subsequent articles (alternating with Scott Manley's articles on glider flight instruction) will explore how Condor can be used to develop and maintain cross-country flying skills, including badge & record flying, cross-country skills instruction/mentoring, and of course, cross-country racing. I will do my best to make them informative and entertaining, and maybe impart some of my enthusiasm for Condor flying in particular and cross-country racing in general. I encourage you, the reader, to tell me how I'm doing and to pass along your Condor stories as this will make the series even more informative and entertaining.

Flight Simulation - A Key to Improving Glider Flight Instruction



From Scott Manley - CFIG

I graduated from the University of Wisconsin in 1973 with a bachelor's degree in secondary education. While teaching high school math and computer science in Milwaukee, I earned a private pilot license (ASEL) and instrument-airplane rating and taught sailing in the summers. In 1977, I went to work for the University of Wisconsin – Madison's Division of Information Technology, and over the next 30 years taught more than a thousand staff how to extract data/information from the university's computer systems. I started flying gliders 8 years ago and since then have become a commercial glider pilot, tow pilot, and glider flight instructor (CFIG). Last year, on my birthday (Jan. 9 in case you want to send a card), I added a single-engine seaplane rating (ASES) to my pilot certificate. (By the way, flying airplanes off water is almost as much fun as flying gliders.) In summary, I like anything that flies and I really love to teach.

And so it was, from the perspective of a long-time educator, that I began to struggle with the realities of flight instruction in general and glider flight instruction in particular.

Those realities are:

1. Aircraft make lousy classrooms -- "The worst place to teach someone to fly is in an aircraft"
2. Classrooms make lousy aircraft -- "The second-worse place to teach someone to fly is on the ground"

3. Insufficient Opportunity to Practice -- "Glider flights are too short, too few, and too far-between for instructional purposes"
4. The Weather Never Cooperates -- "Lesson sequencing is adversely affected: 'can't get a cross-wind when I need one'"
5. Many Valuable Lessons are Never Experienced, and therefore Never Learned -- "You can only demonstrate the result of a stall/spin from base to final one time"

This seemingly insurmountable list of obstacles led me in search of a solution. My aviation readings and educational training suggested the obvious choice: "Flight Simulation". Simulation is widely recognized as a powerful tool in the educational community, and from a flight training perspective, the military and the airlines had this figured out a long time ago. Flight simulation is a highly efficient and cost-effective way to train pilots. The question was whether I could find an affordable, high-quality "glider" flight simulation.

One day at our glider joint, I mentioned my quest for a glider flight simulator. A 15-year old kid named Trace Lewis (who, by the way, had already earned his Silver badge and could fly the pants off most of us) quietly suggested: "You should try Condor." I did and the rest is history. I can now be found, most days, in the Flight Instruction Wing of the Frank Paynter Institute for the Completely Fanatic, and Certifiably Insane.

Over the next few months, I will be offering you my thoughts and experiences on using flight simulation to improve glider flight instruction. I will fill you in on why simulation is the answer to all the instructional challenges listed above, and then some. I will relate to you some eye-opening case studies that support the theory. I will share with you some of my teaching techniques and the simulation-based training resources I have developed. I will let you in a few tips/tricks on using Condor's features in ways the developers never envisioned. And finally, I will expand the educational envelope beyond primary flight training to include:

- proficiency training -- normal operations & emergency/unusual situations
 - "this may be the key to dramatically reducing the number of times we wreck our equipment and kill/injure ourselves"
- learning new skills -- ridge soaring, wave soaring, X-C flying, competition flying, aerobatics, mountain flying, high performance aircraft (gear, flaps, water ballast, flight computers)
- promoting soaring -- educating the public by introducing anyone who will listen to this amazing sport -- simulation is a great presentation medium
- distance education -- freeing yourself from the time/space continuum -- "teaching and learning between real flights with student and instructor being anywhere at any time"

I am excited to be contributing to this new series of articles in Soaring Magazine and looking forward to a healthy exchange of glider flight simulation success stories.