

## Team Flying in Condor with TA & BZ

Frank Paynter (TA) and John Mittell (BZ)



This month's column describes the start of an ongoing experiment by BZ and TA with pair-flying in Condor. The idea was born out of the perceived contrast between the approaches employed by the Australian and U.S. national teams toward team flying training. We'll describe how we got started, what our experiences have been so far, and why we think team training in Condor will become more and more important in the future.

In one of my previous 'Condor Corner' articles, I described how the Australian Soaring Team used Condor to practice team flying for two different World Gliding Championships, and how they thought flying together in the anticipated competition environment, transcending space and time barriers, helped their subsequent performance in the RL (Real Life) WGC. Allan Barnes of Team Australia practiced in Condor for over two years, not to mention flying in RL every chance he got with his teammate (for Allen's second WGC he was teamed with fellow Darling Downs club member Mike Codling). Alan was convinced that his Condor time contributed significantly to his quite decent results in both WGC's.

In contrast, the U.S. Soaring team adopted a somewhat different strategy in preparation for team flying at the WGC in Uvalde. The U.S. Team organization arranged for a team training week at Chilhowee, Tennessee, bringing in Brian Speckley, former WGC Champion and current British team coach to work with our team pilots and pass along what he could in the way of pair-flying expertise. Although I certainly believe that time with a former world champion was beneficial, our results at Uvalde (and an analysis of flight traces) suggest that the week-long training session was not particularly effective.

While thinking about the contrast between the Aussie and U.S. training approaches, I coincidentally noticed that Chilhowee was advertising a 'Team Flying Camp' in between the two weekends of their 2-weekend regional contest and decided to sign up. With the 2-weekend format I would either have to drive all the way back to Ohio in the intervening week, or fly at Chilhowee anyway, so what the heck – at the very worst I would get to fly.

John Mittell (BZ), my good friend and former Condor Cross-Country student also signed up for the camp, and when he saw my name on the list he contacted me and suggested we sign up as a team. I agreed, and we thought it would be a good idea to spend some time in Condor prior to the camp to get a jump on the process. I figured it would give me a chance to see first-hand what I have been preaching for years – that Condor is an effective cross-country racing training tool, and a solution to the time-and-distance conundrum facing most U.S. team pilots. As it turned out, the weather at Chilhowee during that week was less than spectacular, and so I didn't go to the regional or the camp. However, John Mittell and I did get together several times in Condor, and we liked it so much that we decided to keep going after the camp, just for the heck of it.

John now lives in Alabama, and I live in Ohio, so we started our pair-flying adventure with some fairly long telephone conversations. John had attended the Chilhowee team flying camp, and so was able to contribute a lot of the basic pair-flying strategy and tactics lore. His view of the camp was, "if I have a chance to learn from accomplished pilots like Francois Pen, Bill Elliot, and Sarah Arnold, I am in there."

After establishing some baseline terminology and tactical concepts, we started flying together in Condor. Rather than one of us setting up a task and acting as the server, we decided to actively seek out Condor races on the Condor Server list (<http://condorsoaring.com/serverlist.php>) and to fly against other pilots as much as possible. We both had a decent idea of how we stacked up against the competition in Condor-land individually, so we wanted to see how (or if) the team-flying concept would affect our race results.

I can only characterize our initial efforts, charitably, as 'laughable'. It was very difficult for us to stay in the same ZIP code, much less in a close tactical formation, and when we did it was more likely that we would collide than we would help each other (thank goodness for the 'Q' (miracle) command!). The good news was that we weren't actually risking our lives, and that we both realized that this was something we were going to have to really work at in order to convert all the negative aspects of our currently-somewhat-spastic team flying efforts into positives. It helped a lot that BZ is a former naval aviator and had extensive experience with formation flying and pilot coordination. I was pretty much clueless along those lines (but enthusiastic!).

As we continued to fly together, things got better. We had started this adventure with a pretty good foundation of mutual respect and friendship, and that allowed us to work through missed communications and other issues as they arose. We tried ideas with the understanding that if it didn't work, we'd try something else. Both of us were quick to own up to blunders and/or the ever-present "I did it my way" syndrome and this helped build the trust level that is absolutely critical for this type of flying. After 50 hours or so of flying together several times per week, we found that we were able to stay together for most of a flight, sometimes crossing the finish line within a few seconds of each other. Staying together out on course was still plenty of work, and it was an additional mental load that had to be handled in addition to all the other pressures of trying to go fast. However the added workload was offset by the knowledge that we gained more from team flying than we could alone. It was starting to come together, and there was one other thing – we started winning races ;-).

A necessary requirement is that the two teammates are reasonably close in flying skills. Not just in overall skills but also in the skills needed on the day of the flight. Even when both are flying well, there are times that one or the other will have an advantage in distance achieved, altitude or speed. The team should coordinate its tactics to maximize the total energy of the two gliders. One way is to have the lower energy glider to leave the thermal first and the other pilot to use their higher energy state to close the distance and re-establish the formation.

When the difference in energy level is more than can be accommodated by the previous method, the team can make a decision to change formation tactics. If having the lower energy glider leave the thermal first is not sufficient, then shifting to the 'leech' formation is a next step. The top pilot leaves first, and the lower one stays one more turn. Because the 'leeching' pilot generally can do a bit better than the lead pilot (having marked thermals most of the time), quite often the team formation can be re-established.

When the relative energy differential is excessively large, the team makes the decision to have the lower glider stay in the next "good thermal" as long as possible, with the understanding that 'unit integrity' will be (hopefully temporarily) broken. The lead glider continues to offer information that might help the trailing glider avoid bad air and regain close formation later in the flight. Another way to speed the re-join process is to have the lead pilot fly a bit slower than the optimum traverse speed until the trailing pilot is in back in formation.

When the separation becomes more than a few miles, then the decision is made to operate independently, as one of the underlying principles of team flying (as we understand it) is that team flying should never slow either pilot down. Making that determination and vocalizing it relieves any feelings of guilt for the high guy to press on.

The formation itself has to be flexible to fit the situation. For example, in "blue" conditions the formation that is most advantageous has the two gliders nearly abeam, perhaps 3:30 or 8:30 position and within 300 to 600 feet, or about one turning radius. In this way, the team has twice the opportunity to discover the next thermal; either can call the turn, and the other can easily get to the thermal. In other conditions, the formation may resemble a "lead-follower" setup, where one glider is in a trail

position. Such might happen, when there are clouds and the location of the next thermal is more easily determined. Even here, the trailing glider should be within the 300 to 600 feet. Flying on a ridge would be another situation for taking a trail position. We have found that a bit more distance is better on a ridge but not more than about 0.2 nm. Even in a trailing position, the trail pilot can add to the situational awareness of the team. By taking a slightly different path, he can sample more air and identify areas of greater energy, which can help the lead pilot adjust his path to avoid the dreaded bad air.

Timely and brief communication in team flying is critical. Each team will develop its own phraseology to pass information and discuss options. Since we always discuss the possible strategies for the task before we go online, the only conversation concerning strategy is to determine needed changes to the plan. Having a fundamental understanding of what prompts decisions will help too. For example, once on task, the team should explicitly decide on the top and bottom of the working band and the minimum climb rate it will accept for thermalling. Then the radio transmissions entering a possible thermal are better understood in that context. "Sink..Pulling..3 ... continuing" means I have entered the thermal, found 3 kts, but continuing without stopping. Changes to the minimum value for stopping (better or worse conditions ahead, at or below the bottom of the working band, etc) should be explicitly stated so that one pilot doesn't stop while the other continues on.

We have found that having the front glider be the "lead" helps in decision-making. "Lead" will generally have a slightly better view ahead and will get to the thermal first. This never prevents the trailing glider from offering ideas and counter arguments (two heads are \*much\* better than one!). The lead often changes during the flight and we have established that whoever is in front is the lead.

Pulling several of these tactics together typically results in a scenario similar to the following example. BZ is the "lead" and TA is in trail and slightly low. BZ pulls up in a thermal and calls "4, circling left" and begins turning. TA comes in but misses the thermal, (this seems to happen more in Condor than in RL) and calls "missed - continuing". BZ completes his turn and follows TA, using his altitude advantage to re-establish the formation but now with TA in the lead. In this case, the team's altitude was sufficient to continue to the next thermal. Numerous post-flight analyses indicates that this is a good tactic, since staying and having TA circle while looking for the thermal would reduce our overall speed more than moving on at a lower altitude. Note: this tactic will not work in all situations and should be used carefully.

After several months of flying together, we are convinced that pair-flying in Condor has significantly improved our XC racing skills in general and our team flying skills in particular. Moreover, we are convinced that these skills will transfer in large part to RL. In truth, much of the 'magic' in team flying is in the communications skills and trust levels built up over time, and these are exactly the same whether they are being done at the local gliderport or over the telephone in Condor (except the magic happens a \*lot\* faster in Condor). In addition, flying literally every day with your teammate motivates both pilots to hone and extend their individual skills, so as not to be the low/trail pilot. Once the team makes the time and energy investment to traverse the learning curve associated with team flying, the team (and the individual pilots) will advance faster than either pilot could do alone – a true win/win deal.

In closing, consider the following hypothetical future scenario. Due to an increasing awareness of the disadvantages suffered by a country's national teams in international competitions due to a perceived lack of team flying skills, the country in question decides to modify its regional and/or national competition rules (which currently prohibit any form of non-safety related pilot-pilot communications) to allow (nay, encourage!) some forms of team flying. The next racing season, two different teams show up at a hypothetical regional competition. The first team has rarely, if ever, flown together, but figures this team flying stuff can't be all that hard and they are both excellent pilots, so what the heck. The second has spent literally thousands of hours flying together on a daily basis in race conditions in every imaginable terrain configuration and is a really well-oiled machine. Which do you think has the higher probability of doing well – the team that tries to put the whole pair-flying thing together on practice day, or the team that has been training together for the equivalent of 3-5 years? Your mileage may vary of course, but we know who we're putting \*our\* money on!

If anyone reading this article is interested in learning more about using Condor for team training, either John or I will be happy to help. Contact me at 'paynterf@gmail.com' or John at 'jmittell@gmail.com'