Isn't This Fun

The pilot in the left seat beside me looked both ways, clearing the area, and after doing so, started to pitch up and roll into a turn towards the Catskill Mountains, off to the west. In the distance, off our wing, a ski area stood out, it's white trails engraved on the side of a mountain. Through the first 45° of our turn the pilot had been slowly increasing the pitch and the bank. We were now banked about 30° and the nose had pitched up enough, so that if we kept increasing the pitch we would probably stall.

The pitch did not increase, but rather, the pilot maintained the pitch right where it was as we continued our climb, slowly loosing airspeed. The bank, too, stayed constant at 30°. I noticed that the pilot was adding more and more right rudder as we slowed down, to counter the increasing left-turning tendencies. I thought to myself that I sure was glad the controls were coordinated. If we stalled now, without all that right rudder, we'd spin for sure.

The pilot also continued to pull back on the control yoke. For as we slowed, and the elevator (not to mention the rudder and ailerons) became less and less effective, that added back motion was necessary to maintain the pitch.

Just as the nose of the airplane was lined up with the aforementioned ski area, it started to slice back down through the horizon. The pilot had judged this perfectly, because the nose was not falling as a result of releasing pressure on the yoke, but because the airplane had run out of energy. The only way the nose of the airplane would have stayed up, was if the pilot had added just a bit more back pressure. But had that been done we might have stalled. As it was, the stall warning horn was intermittently honking as the nose started it's drop through the horizon.

The pilot now started to release back pressure on the yoke. As we approached the 135° point of the turn the pilot started a slow roll out of the bank. I noticed that the rudder deflection was decreasing in direct correlation with the increase in airspeed as we continued our dive. With a little less than 10° left before we had completed 180° of turn the pilot started adding just a subtle bit of forward pressure to the yoke.

As the ski area came abeam the wing opposite where it had been at the start of the maneuver I made note that we were back at the same altitude and airspeed as we had been when we started this maneuver. The pilot now continued the same maneuver all over again, but this time in the opposite direction as before.

It was a mirror image of the previous climbing and descending 180° turn. As we reached the 90° point of the turn we were at the same altitude as the prior turn, and within 5 knots of the same airspeed. Again the nose of the airplane sliced down through the horizon as the ski area swung past. At the completion of the turn we were back at the entry altitude and airspeed we had when this whole maneuver had commenced. I had just witnessed one of the best lazy eights I had ever seen.

The lazy eight is one of the maneuvers required for the Airplane, Single Engine Land, Commercial Pilot certificate. It usually takes several attempts at flying it before it begins to make sense. One of the big keys to understanding the maneuver is to be able to visualize exactly where you need to be at every point during it's execution. Where you need to be, relative to pitch, bank, airspeed, coordination, and most especially in relation to the reference you picked off the wing at the beginning of the maneuver.

The Lazy Eight, along with Chandelles, Eights On Pylons, and Steep 720° turns, make this particular certificate perhaps one of the most fun to obtain. But why wait until you're working on the certificate to learn it? Or any of the other maneuvers for that matter. I very often teach them to clients who are undergoing their "Wings" training with me. "But why should I bother learning them, if I'm not going to get the Certificate?" you might be asking yourself.

Because they're *FUN*. And more importantly because they will teach you so much about energy management; about the decay of flight controls as you slow down; and about coordination of your flight controls as you take your airplane out towards the corners of it's operational envelope. It will also get your attention out of the cockpit, forcing you to divide your attention between numerous things while teaching you to recognize and rely on the seat of your pants to help you fly through the maneuvers.

Take the chandelle, for example. It is a maximum performance, climbing 180° turn. At the start of the maneuver you roll into a 30° banked turn, add maximum climb power and start pitching up. At the 90° point of the turn you should have reached your maximum pitch attitude, which you will now maintain until the completion of the turn. If you haven't pitched up enough, you won't get high or slow enough by the end of the maneuver. On the other hand it you have pitched too steeply, you'll stall before completing the turn.

From the ninety to the one eighty, you slowly roll out, timing the roll out so that you just finish the turn as you hit 180°. If you don't roll, slowly and continuously, from the 90 to the 180, you might very well have to increase the roll rate at the very end of the turn. On the other hand if you roll too quickly you wont complete one hundred eighty degrees of turn.

And of course as you're trying to judge the roll rate to make it just right, you also have to deal with an elevator that is getting increasingly less effective as you slow down. So you'll have to be pulling back on the stick more and more, to maintain the pitch attitude achieved at the 90° point, as you complete the turn. You also have to be adding more and more right rudder. You'll be carrying maximum power, pitched up fairly steeply, and constantly decelerating. Don't be surprised to find the rudder maxed out at the completion of the turn.

When done right the stall warning should be blaring and the first signs of a buffet should be apparent. Now you have to resume your original cruise speed without loosing any

altitude. Of course as you accelerate those rudders are coming back to neutral. Wasn't that *FUN*? As you learn to fly this to commercial standards you will be learning so much, not only about your airplane but about yourself as well.

The last maneuver I'd like to discuss is Eights on Pylons. This is a maneuver that teaches us about "pivotal altitude" as well as coordination and division of attention. If the Walter Mitty mentality resides within, this maneuver might take you back to the Cleveland Air Races (or Reno for the younger folks). It is a ground reference maneuver that requires you to circle about a "pylon" (in farm country silos can make great pylons) keeping a reference point on the wing pointed at the pylon, then breaking off the turn and flying a straight line for a short distance to where you enter a turn in the opposite direction about another pylon.

What determines your pivotal altitude (that altitude required to keep the reference point on your wing pointed to the reference on the ground) is your groundspeed. Thus, if there is any wind blowing, you will have to climb as your groundspeed increases with a tailwind, and descend with a headwind. The turns will not be a constant radius around the pylon, but will be elliptical, again, if there is any wind.

One of the challenges is to not cheat with your feet, trying to keep the wing on the pylon with the use of your rudder. The maneuver is to be flown with the controls coordinated. One easy way to think about it is that if the pylon is moving back behind the wing reference you will need to pull back on the yoke (this will happen as the wind shifts to a tailwind), and if the pylon is moving forward, (as you turn into the headwind) push forward on the yoke. Simple instructions from simple folk like myself.

All three of these maneuvers offer so much to be learned. Even if you have no inclination to gain your commercial certificate, learning these maneuvers will go such a long way in making you a better pilot. So go out and have some fun! Isn't that what it's all about?

Doug Stewart is the 2004 National CFI of the Year, a Master CFI and a DPE. He operates DSFI, Inc(www.dsflight.com) based at the Columbia County Airport (1B1).