



# Long-Distance Lessons

## How to teach students real-world VFR cross-countries

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I monitored the tower frequency as I crossed the ridge east of Santa Fe, New Mexico. A helicopter was inbound from the west; two airplanes were doing touch-and-goes; another airplane was inbound from the south, but the pilot could not find the runway; and a business jet had just departed. I listened carefully, and then finally I radioed, “Santa Fe tower, motorglider N551SD, 10 east, landing, Victor.”

After a brief silence, the controller answered, “A motorglider, oh, sure, why not!”

But the controller did not know that I had flown from Chicago, and I was about halfway to my destination—Los Angeles. Along the way, I learned a couple of tricks for use when teaching students to plan cross-country flights.

Even if none of your students are planning to fly practically coast to coast, most of them will take a

personal trip by light aircraft in their careers, and as likely as not, it won’t be on an IFR flight plan. By teaching them to roughly plan a route, then plan the detail of each leg, then prepare to solve problems encountered in flight, you’ll better prepare them for real-world traveling in VFR aircraft.

### Roughing It

Setting out a rough route starts with the big picture. In my case, a straight line across 1,600 miles connecting Chicago and Los Angeles marked the basic course. Any chart or map that covers the route and shows the major cities will do at this stage—it doesn’t even have to be an aviation chart, although it helps. Just have your students join the endpoints of the route to form a rough flight path.

The next step is to have your students calculate a leg time with lots of fuel reserve for their air-

plane. This is a critical step. During my flight, once I was in the mountains, the usable airports were much farther apart than on the flatlands. I didn’t want to pass a fuel stop only to find I couldn’t make the next one. For this trip, I had 4.5 hours of fuel at 90 knots true airspeed. I planned my groundspeed at a conservative 80 knots so each of my legs would be 80 nautical miles per hour, times three hours or 240 nautical miles per leg. This left me more than 1.5 hours of flying time reserve. Just before flying the leg, I accurately calculated the leg length and fuel reserve given the forecast winds.

Using the basic route drawn earlier, have your students break the route into legs. Now’s the time to zigzag the route around terrain that they can’t or won’t go over—for example, high terrain or temporary flight restrictions or military operations areas that have to



be avoided. They'll also have to divert left or right to reach airports. In mountain passes—if that's an obstacle they're likely to encounter—they may have to follow lower terrain to climb to a safe altitude. Likewise, they'll need to stay near flat terrain in case they have to make an emergency landing.

Have them fill in the details of the route using pencils. I had a big eraser handy. I wanted a clear line for the direct route line and each individual leg. So once I was satisfied with my course, I highlighted the leg in bright pink or bright orange to make it easier to find when I was in the air. A clearly marked course also made it easier to match weather briefings to the chart.

This is also the time to make sure students have all the current charts they need. I knew that I would need a Los Angeles Terminal Area Chart to navigate the Los Angeles airspace, but I had not found one in Chicago before I left, and the airports along the way did not have one either. Finally, I needed

to get an early start at Prescott, but no airport shop was open yet. Fortunately, the shop owner was having coffee in the terminal café and came to my rescue after hearing about the problem. He opened his store early so I could buy the chart. Whew. I should have bought that chart before I left Chicago.

This is also the time to make sure your students are aware of the old adage "Time to spare? Go by air." I allocated lots of time for the trip. I really could have pushed the aircraft to go faster, but I allowed enough time to stop early for the day if I grew tired. It doesn't help trying to will the aircraft to go faster or for the headwind to decrease. I was at the mercy of the weather and could not take any bad weather in the mountains. I allowed time to stop and wait for the weather to improve. I allotted five days for the trip that would take, at a minimum, three days for 1,600 nautical miles.

I found it interesting to follow roads out to the horizon, amazed at how far I could see, and wondering who was traveling those roads as I passed overhead, although most of my time was occupied keeping up with the checkpoints, including time, speed, and distance. Before your students set out on a journey, make sure their pilotage and dead-reckoning skills are sharp. I took my flight computer with me and worked various problems—perhaps the most challenging of which was to determine the wind from the groundspeed, true airspeed, and wind correction angle, although determining the wind in flight helped me plan the next leg with actual winds rather than forecast winds from the weather briefing.

### Filling in Details

After the rough route is set out from beginning to end, have your

students calculate a leg distance well within fuel reserves, then divide the route into segments using the target leg length. The next step is to plan each leg in more detail, considering many additional factors, and your students will have some questions to ask when they're planning each leg.

### **"Should I fly from airport to airport rather than direct?"**

At least where I fly, it is pretty common to draw a straight line between departure airport and destination airport knowing that a diversion airport is nearby. However, there are times when it's best to zigzag from airport to airport. For this cross-country the route was in strange territory, over long distances without weather reporting, and with long legs when the wind was variable at unknown direction and velocity. I chose to fly from airport to airport over the mountains to add safety and increase my options. Over the eastern Plains, a direct route was just fine.

### **"Do I have the necessary navigation and communication equipment?"**

This is an important question, but one that is overlooked. I actually found that I did not have the right equipment at times to receive airport information or to contact flight service. I had a communication radio and a GPS for navigation. I did not have a VOR receiver, so I was unable to contact flight service on frequency 122.1 to listen on a VOR. This took away some capability if I needed weather information, to update my flight plan, or to call for help. In another case the airport information was on an NDB frequency, but I could not receive that either. I did not know I would have these problems until I tried to use the facilities. I needed more detailed flight planning to check facilities against my equipment.

### **"What is my crosswind lim-**

**itation?”** Traveling long distance and across the mountains, the surface wind was occasionally my enemy. My aircraft had a published crosswind capability of 12 knots, and I had to consider that when planning the leg. Would the forecast winds and the runway arrangement at my destination allow me to land with no more than 12 knots crosswind? At one point, I thought of stopping for fuel at an airport near my course, but the winds were blowing 20 knots at 90 degrees. My planning had to include some options for runways into the wind or for flying early in the morning when winds are calm or for stopping at airports with multiple runways.

**“Are there any pilot limitations?”** This is also an important question that is often overlooked. Is there anything about me that would affect the trip or safety? Am I prepared for hours in a hot airplane, for burning sun, or for turbulence? Can I prevent dehydration? Do I have survival gear, food, and emergency equipment? How long do I want to sit in an aircraft before stopping to take a break? How many hours should I fly in a day?

**“Are there any airplane limitations?”** To add another wrinkle to the trip, my aircraft was limited to day VFR. I was not equipped to fly at night, so I had to be able to do everything in the day. I also could not file or fly IFR, so weather minimums had to be much higher and quite certain. I had to be sure I could maintain VFR.

**“Are there any performance considerations?”** One thing I did have was a turbocharger, which was a real plus once I started to cross the mountains. I had to keep in mind that I might have a turbocharger failure, so if I flight planned based on climb performance with the turbocharger I might be at an altitude

I cannot maintain without it. If I actually planned the flight, route, and altitudes as if I did not have a turbocharger, I would have a good margin from the terrain with it. If I lost the turbocharger in flight, I would have to make an emergency landing, so a safe landing site had to be maintained.

**“Are there any regulations I should review?”** This trip was a great exercise in regulations to remember, and without an IFR flight plan clearing their way, your students’ trips will be, too. When does night begin? What cruising altitude must I use at what altitude above the terrain? With the turbocharger, I actually had the capability to go to 16,000 feet. Wow, that would have cleared the mountains nicely. Only problem was I did not have oxygen on board. What were those altitudes again where I need to use supplemental oxygen? What were those symptoms of hypoxia? Where is controlled and uncontrolled airspace? Controlled and uncontrolled airspace in mountainous terrain is depicted with changes in the floor of controlled airspace marked on the sectional charts. This required some planning ahead of time to be sure I was in the correct airspace.

### Putting Out Fires

Even with thorough route finding and meticulously detailed flight plans, once I was in flight, other problems arose. I had only one radio. What if it failed? I had to have an alternate plan. How do I approach and land at a towered airport without a radio? What were those light gun signals again?

Another challenge was cockpit management. The cockpit was small, with little room for storage. There were few places to stash stuff without some creative thinking. Keeping the vents open helped

me stay cool, but the wind caught my charts, blowing them from my hands. Rubber bands and large paper clips helped keep papers in order and secure. I placed folded charts under my leg to keep them handy. Snacks were reachable, fastened behind the right seat in a plastic bag. The bag also became a convenient place to stow the empty juice bottles and the energy bar wrappers.

The cockpit temperature was hot. Flying west put the afternoon sun baking me as I flew. Sunburn lotion was a must for my face. It was also easy to become dehydrated, so I brought plenty of fluids stuffed in the next seat, and I forced myself to drink. I knew my personal signs of dehydration: dry mouth and headache. Dehydration could easily sneak up on me, degrading my performance when I needed to be sharp.

Once out of the green fields of Illinois and Iowa, I was faced with rugged terrain offering few emergency-landing sites. Safe landing sites required continuous attention. At times I had to deviate from my course to stay within gliding distance of suitable terrain. As I searched for sites, I realized many private strips were leveled in the dirt and sand that were not visible at first and not marked on the chart. Big ranches had a strip somewhere near the ranch house. I found that many roads would be suitable because it was clear that there were no poles along the way. I picked landing spots close to a town or to a ranch house to improve my chances of being rescued.

Avoiding temporary flight restrictions (TFR) proved to be a big challenge. It was easy to fly miles and miles without checking with flight service for TFRs. West of Santa Fe was a TFR for forest firefighting described by radial and distance from the Santa Fe VOR. I did not have a VOR receiver, so that created a prob-

lem. As a solution, I plotted that area on my sectional and picked a major road south of the restricted area. By doing so, I knew exactly where the area was, and I had a clear reference to use to stay clear of it.

One problem that did not show up right away—and probably won't ever for your students—involved the physical characteristics of my aircraft. I had an aircraft with a 52-foot wingspan. This created problems at airports where I had to pass another airplane on a taxiway or where I had to taxi between two lines of parked airplanes. In Prescott, Arizona, I had to span two tiedown spots to have room for the wings. Even so, there was no way to secure the wings, because the provided chains did not reach my aircraft's tiedown rings. If I had to make an emergency landing, I would have no way to secure the airplane. In the future I will carry ropes and chocks with me.

Eventually, I made it. From Chicago to Los Angeles, I had flown 1,600 miles in three days across plains, desert, mountains, rivers, and beaches. I saw a different world on this trip of a lifetime, and it was an amazing adventure—a forest fire-fighting slurry bomber and its red-dish slurry; a massive meteor crater that reduced the few buildings at the bottom into tiny dots; beautiful Los Angeles weather, clear with unlimited visibility; national parks like pictures in their awesome beauty; the oil painting that was Sedona, Arizona, from the air; a huge lake in the middle of a desert; windmills northwest of Palm Springs no longer just a photo. I also saw cross-country flying in a whole new light—one more attuned to our new students than an experienced professional pilot. It proved to be a valuable lesson, and one worth passing on. ■

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